## PROJECTS:

- **IoT Smart Ambulance System**

- ✓ Selected for VTU Sponsored student project. (IoT Smart Ambulance System).
- ✓ Participated in State level Engineering Students Project Exhibition-Competition 2020.
- ✓ Got first Prize in P-Expo-2022(Exhibition) For IoT Smart Ambulance System, JIT, Davanagere.

## Introduction

We introduce a secure (IoT) based healthcare monitoring system. This system will be included in the ambulance and other places. It may play a vital role to reduce cost, rather will be easy to assess from anywhere anytime and will be helpful to take immediate decision. In day to day life, people are affected by various serious and complex disease which are highly sensitive.

Our application 'IOT AMBULANCE' provides a virtual doctor to monitor during emergency situation when patient is boarded on to the ambulance. Which helps the doctor to track key information besides just how fast your heart id beating and other parameters from devices in ambulance will be streamed.

A human heartbeat is captured as data signals through Analog reader and those data will be streamed through socket.io (api) processed by the micro controller.

# Objectives

1. Easy to use, It will be a very handy tool as it shows all the data collection and information by using just only the internet. So, it reduces the workloads and stress of the relatives of the patient who work outsides.
2. Better patient experience for being connected to the health care system through IoT, doctors can improve the diagnosis accuracy as they are getting all the necessary patient data at hand. In a word, we can say that it allows monitoring patient continuously and remotely.

3. Provide an accurate detection. By using this system, we can get approximate result based on patient health. Moreover, it will be less error, collect data in less time and more accuracy than any human performances.

4. Reduce costs when a patient gets health service at home on a real time basis, there is no need for unnecessary doctor or nursing visit. In particular, this project helps to cut down cost for hospital stays.

5.Giving a quality life for old aged people, Most of the people at their old age, like to stay at home with their dear ones rather than visiting or passing time in hospitals. But hue to hectic lifestyle people are suffering from many diseases at their early age and the older people become very weak. Additionally, this project will be beneficial to ICU patient.

6. Integration of IoT component in Ambulance.

7. Develop mobile online interface to read streamed data.

8. Process and predict data stream for useful diagnosis.

9. Provide an accurate detection. Being connected to the health care system through IoT, doctors can improve the diagnosis accuracy as they are getting all the necessary patients data at hand.

10. Allows monitoring patient continuously and remotely.

11. By accessing patient's health data in real time information helps to make decision for the doctor on how the treatment is going on and what should do next.

## Problem Statement

As compared to other countries with proper emergency system, there is no emergency system which could play a major role in managing the medical emergency in India. A typical problem such system is face is to get the patients health condition in the ambulance.Some of the existing systems are depends upon the mobile application that totally depends upon the network connection.But some situation mobile applications cannot send the patient data and accidental spot location due to lack of power and bandwidth.

# SYSTEM DESIGN

## Methodology

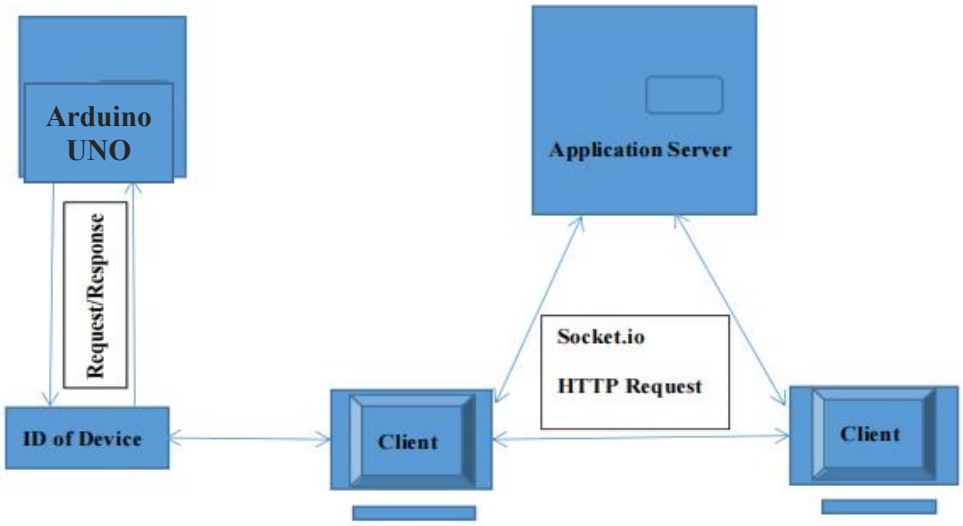


**Fig 4.1.1: Methodology**

## Server communication:

- This is the nikki-build tool used to communication between two servers.
- Communication between the micro controller server and application server.

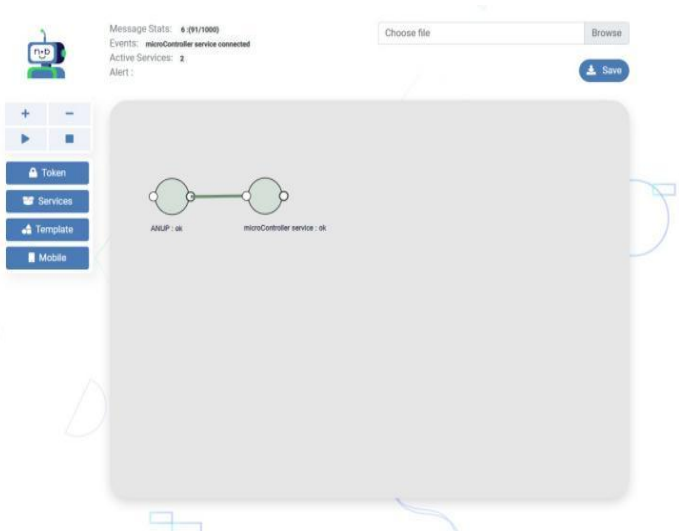


**Fig 4.1.2: Server communication**

**nikki-build**

nikki-build is a rapid prototyping and learning platform, it provides connectivity across various programming languages, operating systems, Hardware like mobile, micro controllers. Hardware and software abstraction and connectivity provide by nikki-build enables developers to explore and use the resources across domains. This gives developer a great power, developer can be focused on their core area yet reuse the existing computer science ecosystem.

## Sequence Diagram

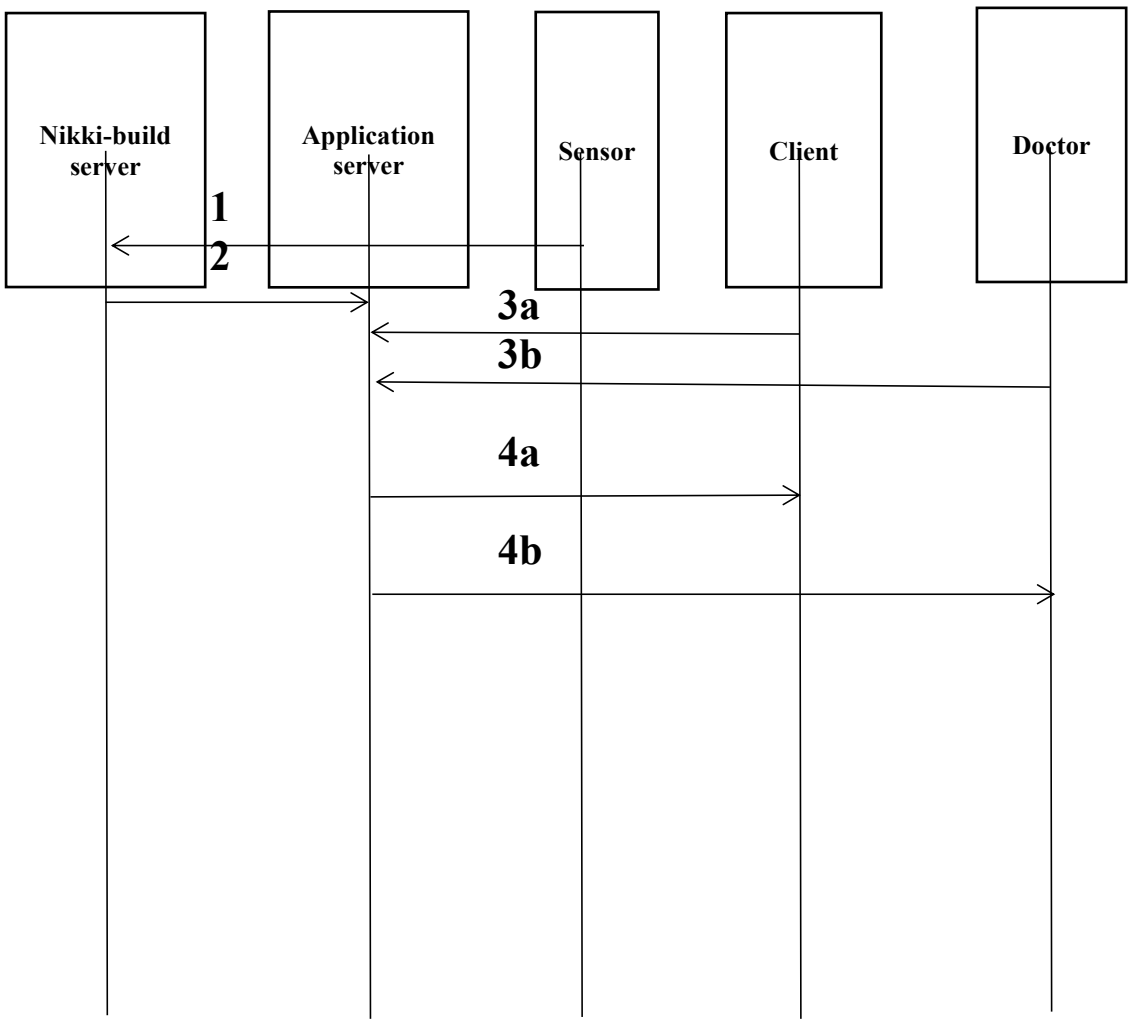


**Fig 4.2.3: Sequence Diagram**

1. Ambulance with Micro controller sensors connected to the nikkibuild server.
2. Nikkibuild server streams sensed valued data to the application server.
3a. User initiates HTTP 3 way handshake. Sensor reading response with client interface.
3b. User initiates HTTP 3 way handshake. Sensor reading response with doctor interface.
4a. Client gets the sensed value data from application server using socket.io type of communication.
4b. Doctor gets the sensed value data from application server using socket.io type of communication.