Sambhram Institute of Technology
Department of Electronics & Communication Engineering

Mini Project Review - Phase I

"IoT Based Patient Health Monitoring using ESP8266 & Arduino"

By,

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Introduction

1. *Healthcare* is given the extreme importance now a- days by each country with the advent of the *novel corona virus*.

2. So in this aspect, an IoT based health monitoring system as a solution for such an epidemic.

3. *Internet of Things* (IoT) is the new revolution of internet which is the growing research area especially in the health care.

4. With the increase in use of wearable sensors and the smart phones, these *remote health care monitoring* has evolved in such a pace.

5. *IoT monitoring* of health helps in preventing the spread of disease as well as to get a proper diagnosis of the state of health, even if the *doctor is at far distance*.

6. In this project, a *portable physiological checking framework* is displayed, which can continuously screen the patient's *heartbeat, temperature* and other basic parameters of the room.

7. We proposed a nonstop checking and control instrument to *screen the patient condition* and store the patient information's in server utilising *Wi-Fi Module (ESP8266)* based remote correspondence.

8. A remote health monitoring system using *IoT* is proposed where the *authorised personal can access these data* stored using an *IoT platform* (*ThinkSpeak*) and based on these values received, the diseases can be diagnosed by the doctors from a distance.

Objectives

1. The core objective of this project is the ***design and implementation*** of a ***smart patient health tracking system*** that uses ***Sensors*** to track patient health and ***uses internet*** to inform their loved ones in case of any issues.

2. The objective of developing monitoring systems is to ***reduce health care costs*** by reducing physical office visits, hospitalisations, and diagnostic testing procedure.

3. Each of our bodies utilises ***temperature*** and also ***pulse*** acknowledging to pursue understanding wellbeing. The sensors are linked to a ***microcontroller*** to track the status which is thus interfaced to a ***LCD screen*** and additionally ***remote association*** with the capacity to alert the concerned.

4. If framework finds any ***sudden changes*** in understanding ***heart beat or body temperature***, the framework can consequently alarm the client about the patient's status over ***IOT*** and furthermore indicates subtle elements of pulse and temperature of patient ***live on the web***.

Components

1. Arduino Board - (Arduino UNO)

2. ESP8266 - Wifi Module

3. LCD Display - (JHD162A 16X2)

4. Potentiometer

5. Pulse Sensor - from pulsesensor.com

6. Temperature Sensor LM35 - Analog Temperature Sensor

7. Resistor - 2K, 1K

8. LED - 5mm LED

9. Connecting Wires - Jumper Wires

10. Breadboard

Block Diagram
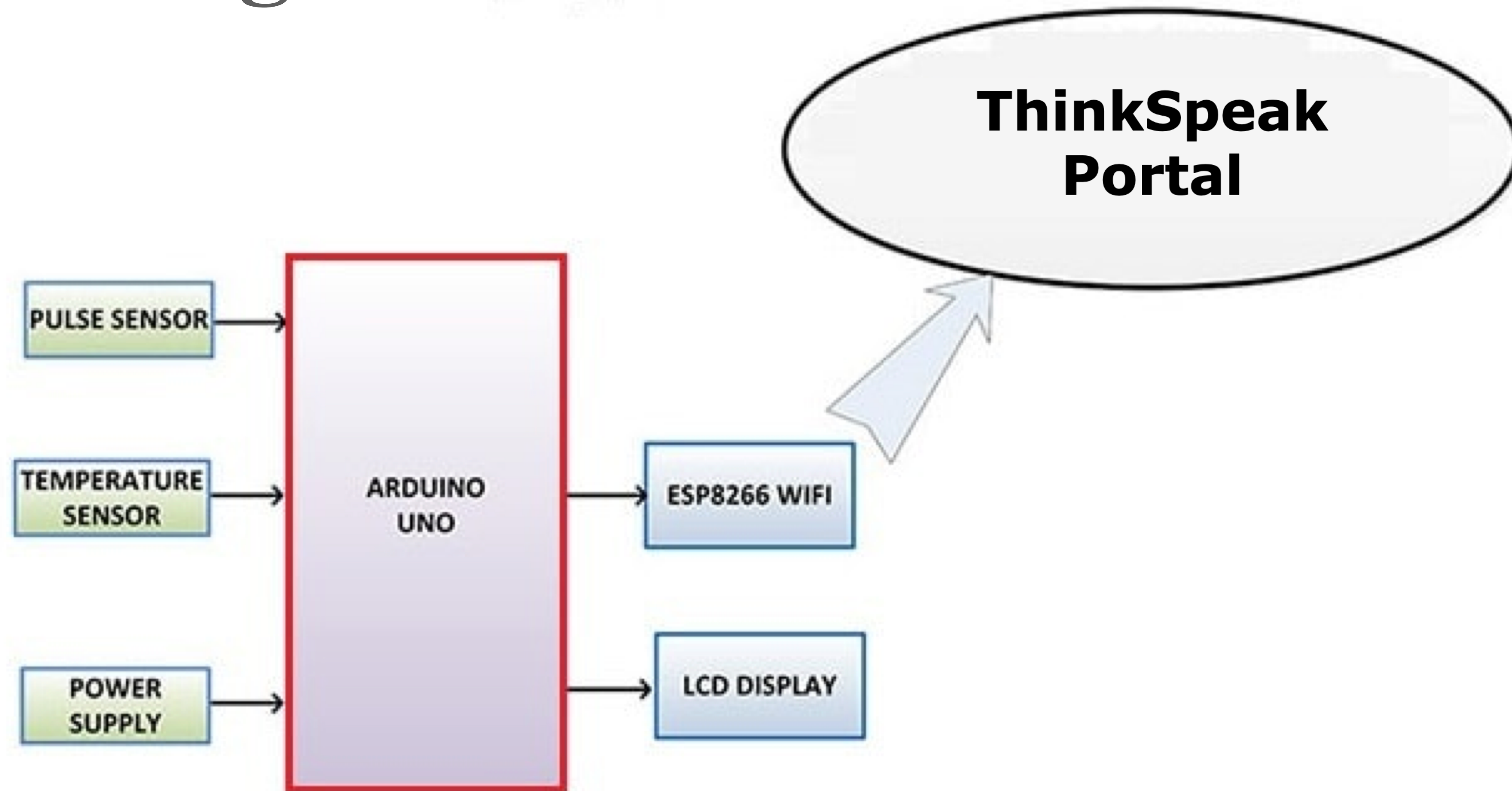
Fig. : *IoT Based Patient Health Monitoring System using ESP8266 & Arduino*

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Working Principle

1. The **Arduino Sketch** running over the device implements the various functionalities of the health care system.

2. Functions like reading **sensor data** and converting them into **strings**

3. Passing them to the **IoT platform (ThinkSpeak)**

4. Displaying measured pulse rate and temperature on character **LCD** & hosted **IoT platform (ThinkSpeak)**
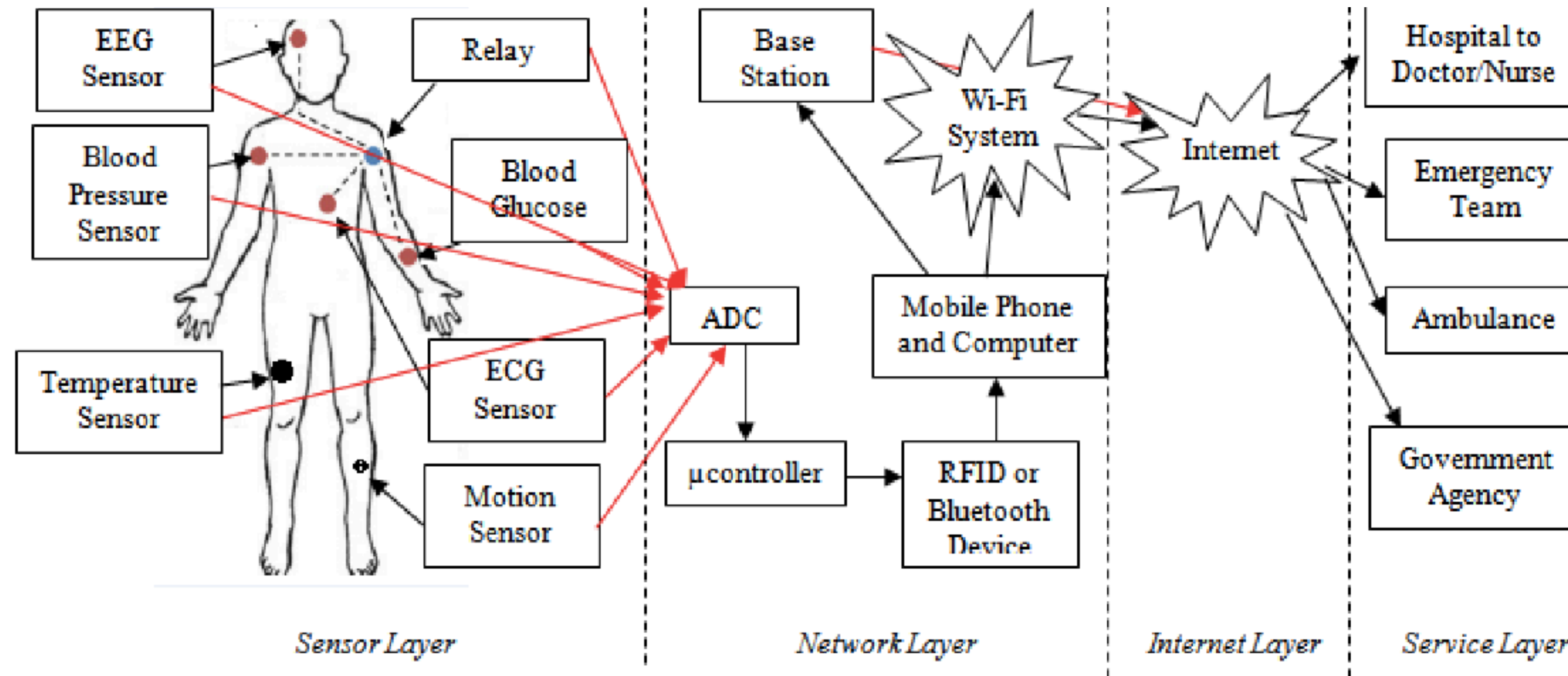
*Fig. : IoT based Healthcare Monitoring Schematics*

Expected Results

1. *Locally* : The body temperature sensor, pulse rate sensor, room temperature sensor values are calibrated using the microcontroller and displayed on the LED board.
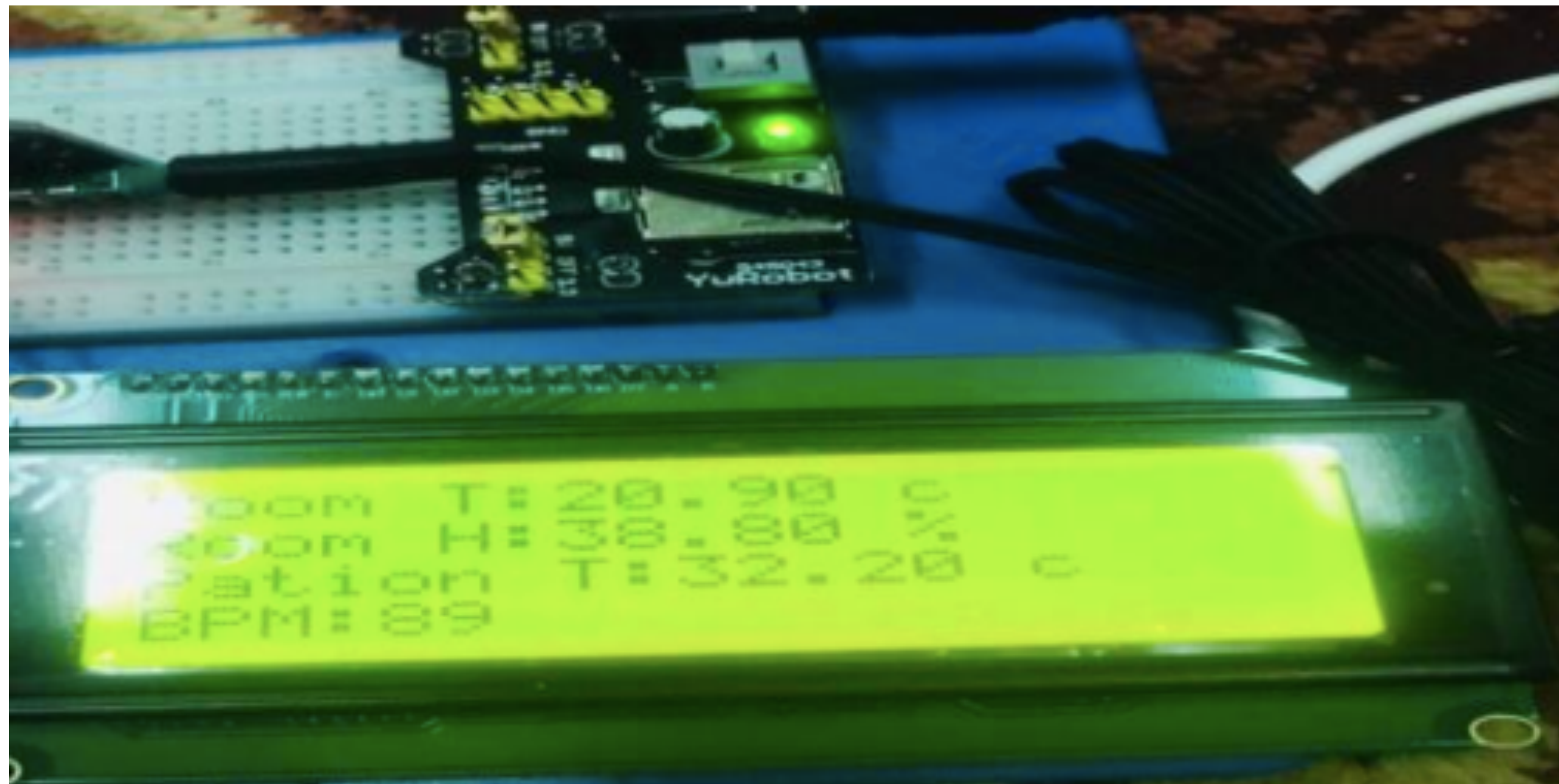
Fig. : Working Prototype

2. ***Online*** : These sensor values are then sent to the database server. These data can be accessed from cloud by the authorised users using the IoT application platform (*ThinkSpeak*). The sensor values of the patient is displayed in the application as widgets.
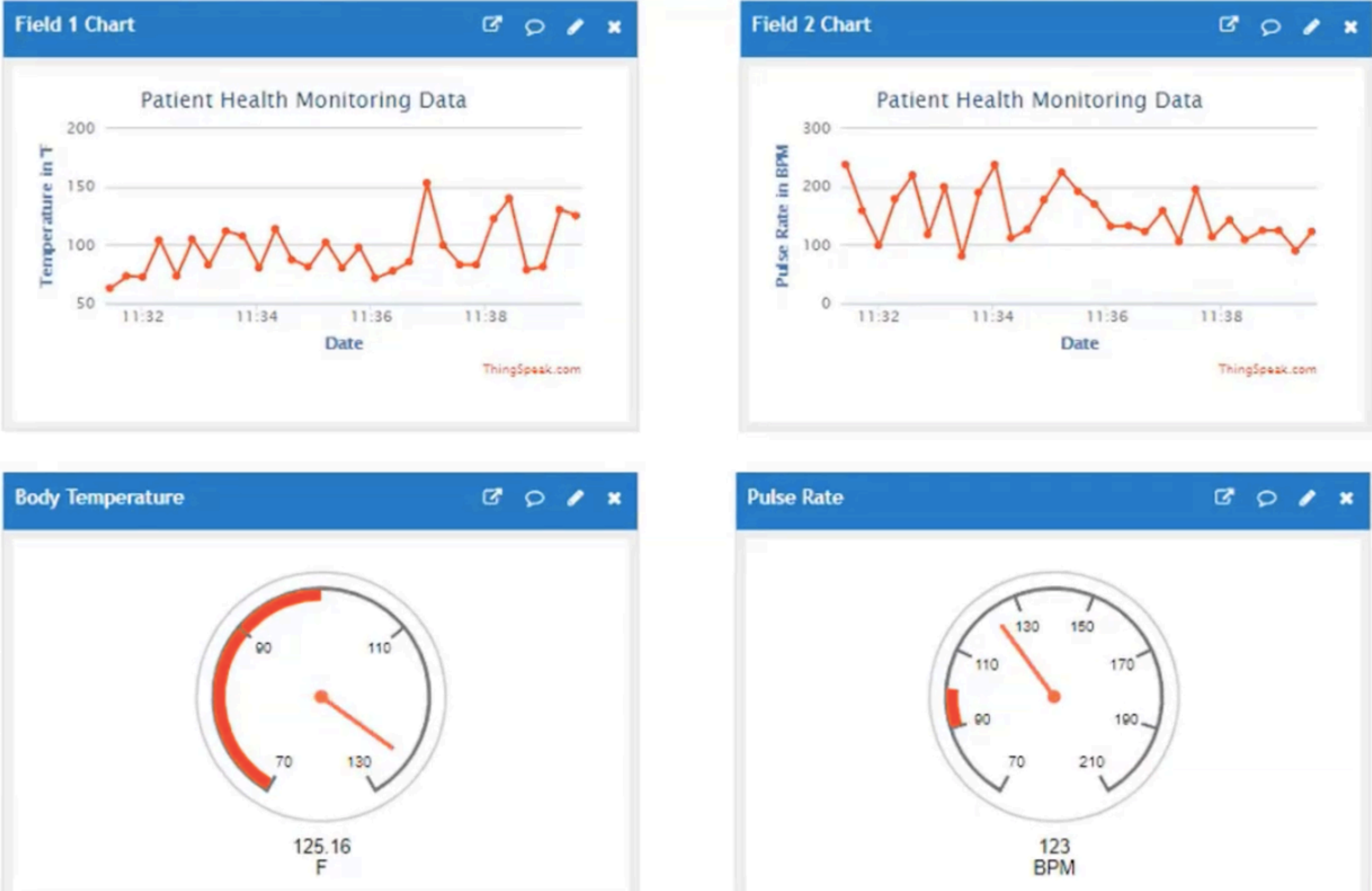
Fig. : ThinkSpeak IoT Portal's Widget Panel

Advantages and Applications

Advantages :

1. Portable **pocket sized** health monitoring system.

2. Real time health care **data logging.**

3. Easily accessible **ThinkSpeak E-Portal**, which can be accessed anywhere around the world.

4. Simple hardware, **highly user friendly** targeting a large age group.

Applications :

1. **Remote areas** which are inaccessible to health care facilities, if educated can take care of their health with this tool.

2. Health **monitoring** purposes for analytics.

3. Targeting a fail proof system as the health care data can be **accessed remotely** from the **end-user** as well as **government's side**.

4. Helps in securing life of the **survivors** who lost their loved ones in these hard times.

Conclusion

1. The ***Internet of Things*** is considered now as one of the feasible solutions for any remote value tracking especially in the field of ***health monitoring***.

2. It facilitates that the individual prosperity parameter data is secured inside the ***cloud*** and easy to access.

3. In this project, an ***IoT based health monitoring system*** was developed. The system monitored *body temperature, pulse rate and temperature using sensors*, which are also displayed on the ***LCD*** as well as ***IoT Platform (ThinkSpeak).***

4. These sensor values can then be sent to a ***medical server*** using ***wireless communication***. These data are then received in an authorised personals smart phone with ***IoT platform***.

5. With the ***values*** received the doctor then diagnose the disease and the ***state of health*** of the patient.

References

1. *S.H. Almotiri, M. A. Khan, and M. A. Alghamdi. Mobile health (m- health) system in the context of iot. In 2016 IEEE 4th International Conference on Future Internet of Things and Cloud Workshops (FiCloudW), pages 39–42, Aug 2016.*

2. *Gulraiz J. Joyia, Rao M. Liaqat, Aftab Farooq, and Saad Rehman, Internet of Medical Things (IOMT): Applications, Benefits and Future Challenges in Healthcare Domain, Journal of Communications Vol. 12, No. 4, April 2017.*

3. *Shubham Banka, Isha Madan and S.S. Saranya, Smart Healthcare Monitoring using IoT. International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 15, pp. 11984-11989, 2018.*

Thank You