SMART IOT BASED ICU PATIENT HEALTH MONITORING SYSTEM

Mr. Atul Patki*1, Mrs. Vandana Maindargi*2

*1Student, Electronics & Telecommunication Engineering, Terna Collage Of Engineering, Dharashiv, Maharashtra, India.

*2Guide Electronics & Telecommunication Engineering, Terna Collage Of Engineering, Dharashiv, Maharashtra, India.

ABSTRACT

Patient health monitoring is necessary in the healthcare field. Now a day's technological development in health care facilitate to monitor and analyses the patient health. We are hereby producing IOT based approach for health monitoring thereby continuously monitoring and analyzing the patient from remote location. With this approach doctors and relatives are continuously familiar with patient health parameter.so that this is advantage for patient treatment. Patients' health parameters like temperature, pulse rate, oxygen level, and ECG are displayed on the IOT platform. This gives easy access to live Local as well as remote monitoring.

Keywords: Max30100, ECG, Pulse, Oxygen, DHT11, IOT, Patient Health.

I.   INTRODUCTION

In this project, we are implementing a real-time health monitoring system for patients who are admitted to ICU. The health parameters like Body temperature, Pulse rate, Oxygen level, and ECG are measured and displayed on the IOT platform. Room Temperature and humidity are also monitored. This is implemented by using the NodeMCU microcontroller. Sensors are interfaced to the microcontroller as input. The microcontroller reads the data from the sensor converts to a suitable format and transmits it to the IOT server. This server can be accessible by Doctors and relatives.

II.   LITERATURE REVIEW

A literature survey is carried out with the following details for patient health monitoring. Various methods are proposed for health monitoring systems.

1. C R Srinivasan has proposed a system of IOT-based health monitoring that can be done with an ESP8266 wifi module, LM35 Temperature sensor, and Pulse sensor. The sensor data is collected by the ESP8266 wifi module and displayed on the IOT application. This data is used as a trigger for the IFTTT application. IFTTT can send SMS/email on the trigger received from data. He used the Thigspeak IOT platform to demonstrate the result. ESp8266 wifi module can easily programmed to connect IOT. The data received from the sensor is read and displayed on the IOT platform.

2. Yedukondalu Udara has proposed a system using Arduino mega 2560, with sensors like finger clip sensors, ECG sensors, temperature sensors, WiFi modules, and GSM modules. IOT-based health monitoring systems can be implemented. Here the Wi-Fi module is used for internet connectivity and the GSM module is used for sending alert messages. He provided a Local display on LCD. He used Arduino Mega 2560. So it requires an external wifi module to connect to IOT.

3. Sathiya Girija has proposed a system for IOT-based health monitoring using Arduino Uno, a Temperature sensor (DS18B20):, a Blood pressure sensor (BMP085): A pulse sensor (sen-11574), and developed a system using Arduino IDE

4. Prachi Patil explored the idea of health monitoring using an ECG module, Pulse oximeter, Temperature Sensor, Glucometer, and Blood Pressure sensor. Atmega 328p is used as a microcontroller which reads the data from the sensor. This data is processed and sent to the IOT cloud with the help of a Wi-Fi module.
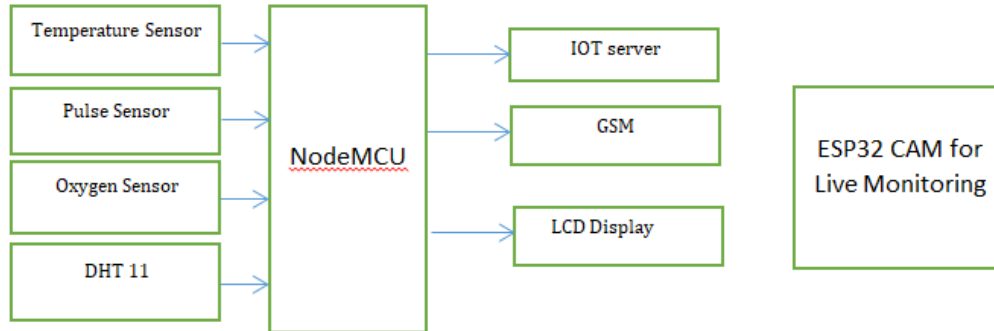
III.   MODELING AND ANALYSIS

Block Diagram
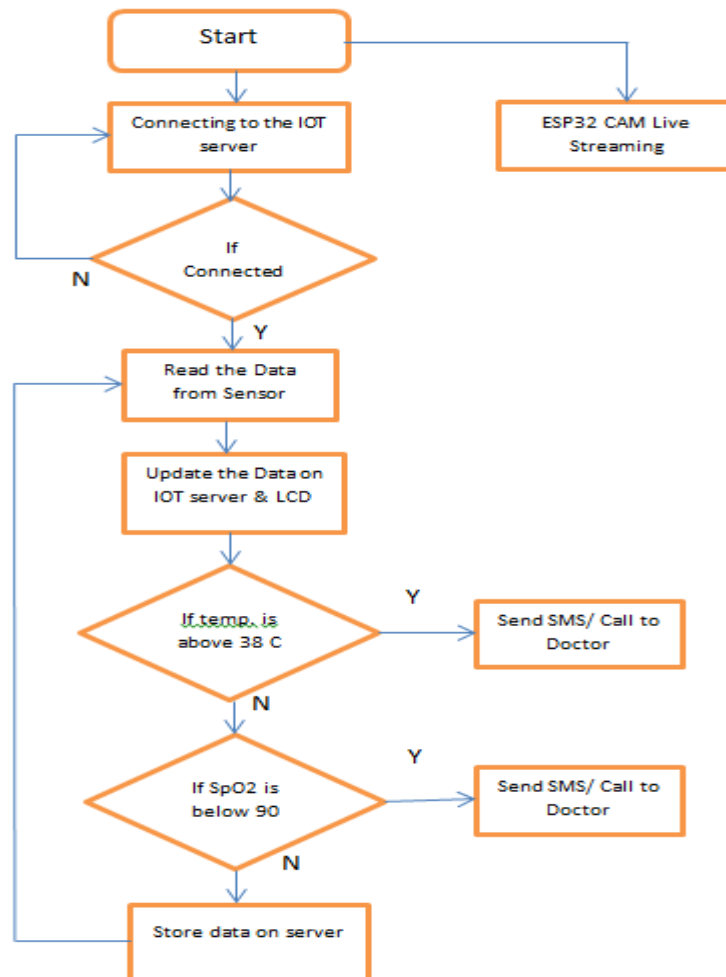

Figure 1: Block diagram.

Flow Chart

Figure 2: Flow chart

Proposed System

In this project, we are using NodeMCU as a microcontroller. The function of NodeMCU is to read the data from the sensor and display it on the IOT platform. MAX30100 is used to measure Body temperature, Pulse rate & Oxygen level. AD8232 ECG module used to display ECG.DHT 11 sensor is used to read data on Room temperature and humidity. NodeMCU scans sensors periodically and updates data on adafruit. IFTTT is linked to Adafruit to send SMS. Adafruit provides a trigger to IFTTT then it sends an SMS to the registered mobile number.

Similarly, the GSM module is used to call Doctors in emergency conditions. The data is displayed on LCD for local indication. The data is stored on the server for further reference. ESP 32 CAM is used to provide live streaming of patients to doctors and relatives.

Components

1. Node MCU

2. ESP32 CAM

3. MAX30100 Sensor

4. AD8232 ECG sensor

5. LCD display

6. GSM module

IV.   RESULTS AND DISCUSSION

Max30100 is working efficiently and gives accurate output. It reads Body Temperature accurately. A body temperature above 38 ° C is considered Fever and an SMS is sent to the registered mobile number. And call is made to the registered mobile number. It reads Oxygen Levels accurately. If the oxygen level falls below 90% SMS and Call are done to the registered mobile number. It also reads the Pulse rate. The values of Body temperature, Oxygen level, and Pulse rate are displayed on IOT adafruit and LCD display.AD8232 ECG sensor module reads the data and displays data on adafruit. All the parameters are stored for further reference.ESP32 CAM provides the live streaming of patients.

V.   CONCLUSION

The use of IOT in the medical field is beneficial for improvement in the quality of treatment thereby saving many lives is possible. The proposed system is successfully implemented and the results of this system are successfully tested.

VI.   REFERENCES

[1]   C R Srinivasan, Guru Charan, P Chenchu Sai Babu, An IOT based SMART patient health MonitoringSystem, Indonesian Journal of Electrical Engineering and Computer Science Vol. 18, No. 3, June 2020, pp.16571664

[2]   Yedukondalu Udara, Srinivasarao Udara, Harish H M, Hadimani H C, HEALTH MONITORING SYSTEM USING IOT, International Journal of Engineering and Manufacturing Science. ISSN 2249-3115 Volume 8,Number 1 (2018) pp. 177-182

[3]   Sathiya Girija Ha, Naveen Kumar Nb,,Vetrimanirathinam Sc, Manokaran Kd   IoT Based Patient Health Monitoring System, International Journal of Research Publication   and Reviews, Vol 3, no 6, pp 2127-2130,

       June 2022.

[4]   Ms. Prachi Patil, Mr. Swapnil Patil, Mr. Gaurav Parab, Ms. Mugdha Salvi, Mr. Ananthu Nair, IoT based

[5]   Patient Health Monitoring System,   International Journal of Engineering Research &   Technology (IJERT),

[6]   ISSN: 2278-0181,Published by, www.ijert.org,NTASU – 2020. Conference Proceedings, Special Issue – 2021