



IoT BASED HEALTH MONITORING SYSTEM

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Abstract: In any pandemic situation it is very important to quarantine or to keep the patients under isolation, but during same time doctors are need to check health conditions of patients too. The major problems are, doctors are needed to check patient's physical condition regularly, and the doctors will have risk to get the information from monitoring process. In order to solve this issue we are required to design a remote IOT based health monitoring system which can be used to remotely monitoring of many patients through the internet. The system checks patient's heartbeat, temperature, oxygen proportion and blood pressure by sensors. This system used to send the data over the internet using Wi-Fi broadcast by connecting to Wi-Fi internet connection. In order to display the data remotely on thing speak platform data transmission and reception done over internet. Through nodeMCU based circuit whole system will be running, in that process if any irregularity happens in patients health, a buzzer can be used as alarm. The designed system will be kept near to the patient and sensors will be in contact with patients body and remotely data used to send. Hence for doctors it is possible to check many number of patients when necessary.

Index Terms—IoT, NodeMCU, Sensors.

I. INTRODUCTION

Health is a prominent worry as humanity progresses through each era. The recent corona infection outbreak in China, which has wreaked havoc on the country's economic situation, which is an example of how the health care has become increasingly important. In areas where the disease has widespread, it's usually a wise idea to screen patients condition using remote health and fitness tracking technology. As a result, a health tracking gadget based on the Internet of Things (IoT) is the current option. Remote Person Monitoring connection promotes clients to report outside of traditional medical arrangements (ex, at house), which gives information to human surveillance offices at reduced costs. The goal of installing monitoring gadgets is to save medical costs by reducing visiting hospitals, clinic, and analytic seeking out device usage. Every human bodies employs temperature also the pulse recognition to assess our health. The sensor devices are linked to a Microcontroller that is interfaced to an Liquid Crystal Display, as well as having the ability to exchange informations. If it detects any unpredicted changes in human heart beat or body heat, the sensors informs the customer about the patient's health condition via IoT and also displays dispersed aspects of pulse and temperature of the customer at a time on the internet. In the same way, IoT establishes sufficient wellbeing in accordance with shape, using the internet to exhibit quiet human health aspects and extending period. The Internet of Things (IoT) was considered as a revolutionary idea that was implemented in a technical world by using energy-efficient technology.

II. LITERATURE SURVEY

[1] Olutosin Taiwoa., Absalom E. Ezugwib, "Smart healthcare support for remote patient monitoring during covid-19 quarantine", *Information in Medicine Unlocked*, quantity.20, 2020, pp.100438. In the paper we used, a well developed health monitoring system designed by author. The system facilitates doctors to monitor patients health conditions (Temperature, Heart rate, ECG). If particular patients health parameters falls down than the particular level, SMS is sent

to the doctors smart phone using standard GSM module. They used Zigbee for wireless networking.

[2] Mirzu Mansor Baig, Hamid Gholamhosseine "Smart health monitoring systems: an overview of design and modeling", *J Med Syst*, volume. 37, 2013, pp.9898. Author has presented "Smart health monitoring systems an overview of design and modeling". Here they considers IOT as a worldwide network communications, that links physical and virtual things. This paper wish to show how radio frequencies are detected and IOT technologies allow patients to admit to health care services.

[3] Prasantha G., Tzonelih H., "BSN-care: a secure IoT-based modern healthcare system using body sensor network", *IEEE Sensor journal* volume. 16(5), 2016, pp.1368–1376. In this paper it is a movable physiological monitoring system that is able to continuously monitoring the patients health rate using ECG. Signals produced during the muscle tightening is

sensed by the system and it is recorded.

[4] Ashwini Gutte, RamkrishnaVadali, "IoT Based Health Monitoring System Using Raspberry Pi", IEEE, 2018 Fourth International Conference on Computing, Communication, Control, and Automation (ICCUBEA) They used an exclusive sensor to monitor a patient's health metrics in this paper. As a result, they selected the Raspberry Pi for IoT platform, which provides a tiny platform for a Linux server at a reasonable cost. The Customers can use Cloud's services to create and deploy apps on virtual servers. Sensors in the cloud, such as temperature (DS18B20), heartbeat, blood pressure, and ECG (AD8232), are in charge of receiving, storing, and sending patient data.

III. PROPOSED SYSTEM

The system has fundamental concept of continuously monitoring patient's health condition through online. As it's effect, for this health monitoring system design three stages of architectural elements occurs, they are: (1) Sensor unit (2) Data dealing out Module (3) Web User boundary. The different sensors can interfaced and can used to get the data from the patient's body through physiological indications. Then the collected data is uploaded using an ESP8266 module before that datas being sent to the IoT web server. Thing Speak is used for the graphical reading and to display the collected datas in the web user boundary. The present readings and process of transactions are displayed through Thing Speak platform. For the communication between web server and Wi-Fi module HTTP protocol; can be used. Patients can be monitored in real time thanks to the user interface. We can see the system architecture for developed system in figure 1. The different sensors are together employed to get the data from the hospital environment, Patients will have their pulse rate and SpO2 measured using a max30100 sensor, temperature measured with an LM35 sensor, blood pressure measured with a BMP280 sensor, and measurement results displayed on a mobile app and LCD display. All the sensors are coupled to the ESP8266 computing point. When all those (temperature, heartbeat, blood pressure, and blood oxygen level) sensors are interfaced, nodeMCU becomes the heart of the system. The signals are detected by the sensors and detectors in analogue format, must then be converted to digital format. The information is transferred to a cloud or server. The ESP8266 captures sensor data and sends it wirelessly to IoT websites. The data will be shown in the mobile app using a bluetooth module that receives data from the nodeMCU and saves it to the cloud. The board has its own processing unit and Wi-Fi. The output of the sensors is then interfaced to the IoT web server. The informations will be accessed by any network-enabled devices. The data will be plotted graphically, and we have channel based system. Then the data will be processed using an ESP8266 module before being sent to the gateway server. In the web user interface, for graphical interpretation and to display the collected data we can utilize Thing Speak platform . The present status and process of transactions are displayed through Thing Speak. On the LCD panel, calculated data from the human being can also be shown.

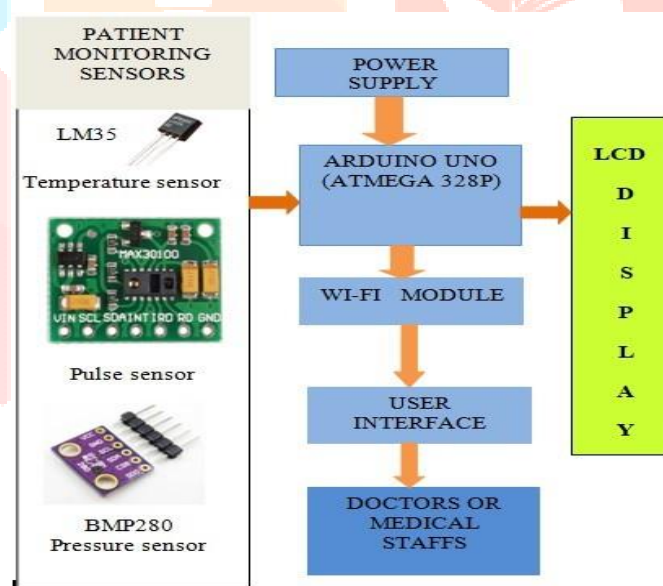


Fig 1: Block diagram of Monitoring system

III. Flowchart of detection

The active programs are uploaded to the sensors and interfaced to nodeMCU. Particular sensors will sense pulse rate, blood oxygen level and body temperature. If the SpO2 falls below the 95% also the heart beat falls below 60 and above 100, then buzzer will make an alert. All the readings will be displayed in real time LCD display also data will be transmitted to server end.

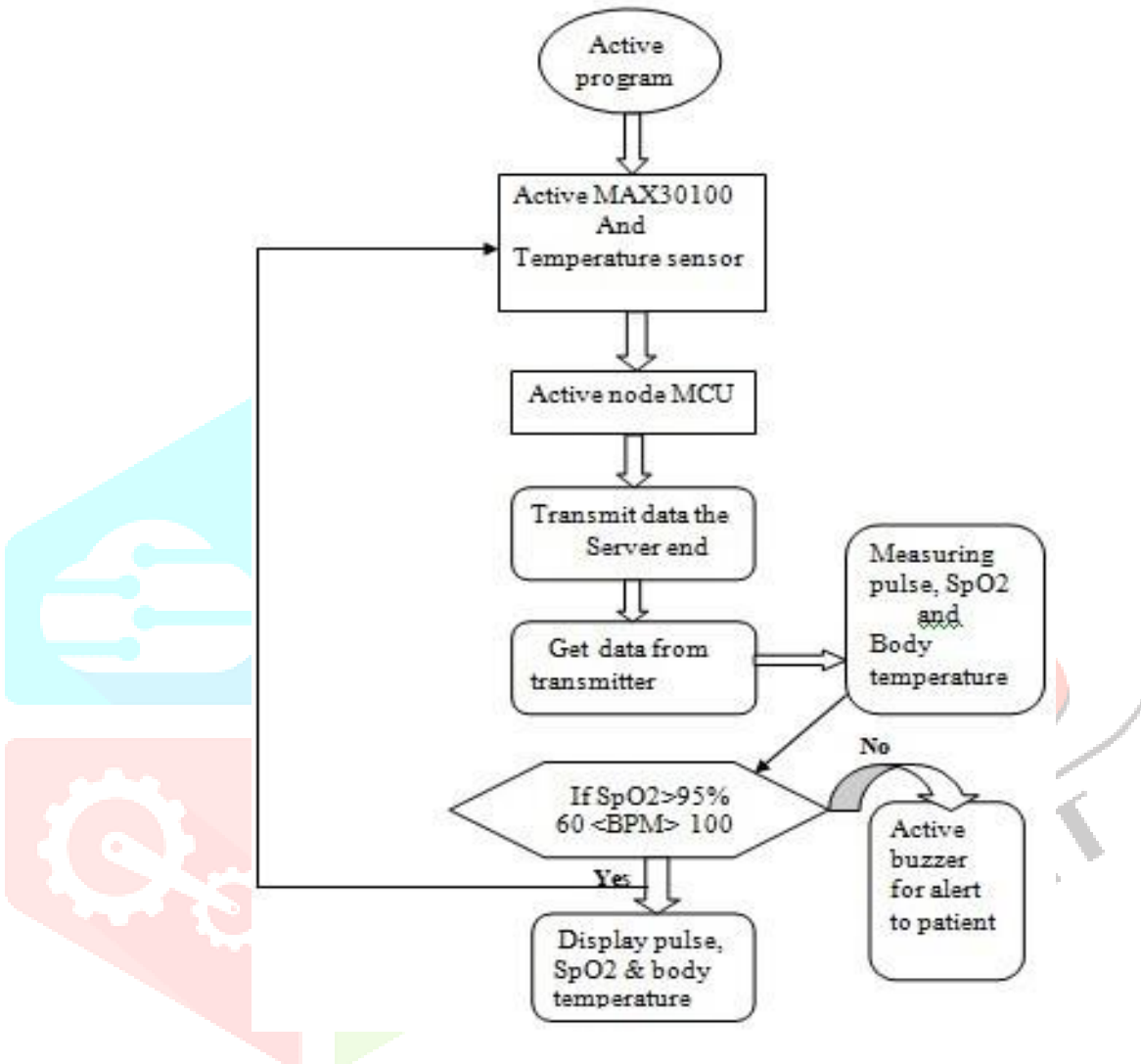


Fig 2: Flow chart

IV. ADVANTAGES AND DISADVANTAGES

A. Advantages

- Efficient treatment
- Reduced risk in critical time
- Connectivity of devices
- Collection and analyze of massive amount of data
- Reduction of health care cost

B. Disadvantages

- Accuracy
- Cost
- Risk of failure
- Integration

V. RESULTS

System include both hardware and software parts which is essential for system. The sensors are attached to human body and they measure the accurate value of body temperature, pressure, heartbeat rate and blood oxygen level. Because of light weight prototype system can be easily moved from one location to another. All the sensors examined individually and they worked adequately. Measured values obtained on real time LCD display also in iot platform. Device had experimented by four people and it provided accurate value.



Fig 3. The device that gives the reading



Fig 4: Pulse rate on Thingspeak

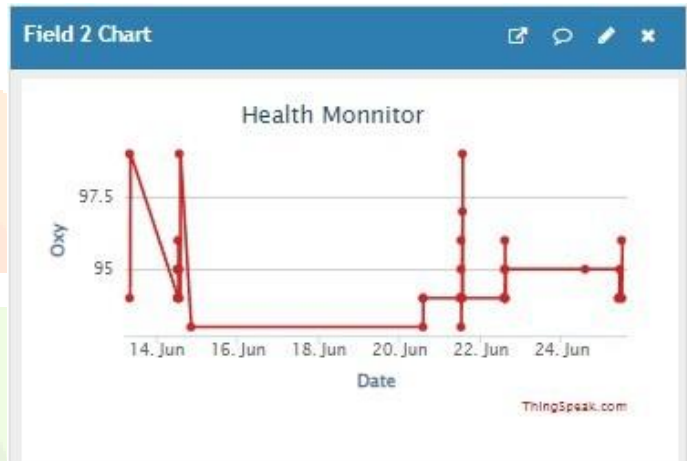


Fig 5: SpO2 on Thingspeak



Fig 6: Temperature on ThingSpeak

VI. CONCLUSION

In this paper, we discuss the relevance and advantages of incorporating IoT into a user-friendly remote health monitoring system that bridges the gap between doctors and patients. Even if the patient is distant from home or a physician, the little sensors combined with IOT will have a significant impact on their lives. This system is practical to use in ideal way in rural areas, so that patients are not required to be follow the regular basis.

VII. REFERENCES

- [1] OlutosinTaiwoa,, Absalom E. Ezugwub, "Smart healthcare support for remote patient monitoring during covid-19 quarantine", Information in Medicine Unlocked, volume.20, 2020,pp.100428.
- [2] Mirza Mansoor Baig, Hamid Gholamhosseini "Smart health monitoring systems: an overview of design and modelling", j Med Syst, volume. 37, 2013, pp.9898.
- [3] Prosanta G., Tzonelih H., "BSN-care: a secure IoT-based modern healthcare system using body sensor network", IEEE Sensors journal volume. 16(5),2016, pp.1368–1376.
- [4] Ashwini Gutte, RamkrishnaVadali, "IoT Based Health Monitoring System Using Raspberry Pi", Fourth International Conference on Computing Communication Control and Automation (ICCUBEA) IEEE, 2018.

