International Journal of Advanced Technology in Engineering and Science
Vol. No. 09, Issue No. 07, July 2021
www.ijates.com
ijates
ISSN 2348 - 7550

HEALTH MONITORING SYSTEM USING IOT

Ganesh Tripathi [1], Ankita Singh [2], Ankit Tripathi [3], Aditi Singh [4]

Mahesh Kumar Singh (Assistant Professor) [5]

Department of Electronics and Communication Engineering [1,2,3,4]

Department of Electronics and Communication Engineering [5]

Buddha Institute of Technology, Gida, Gorakhpur U.P., 273209

Dr. A.P.J. Abdul Kalam Technical University Lucknow U.P., 226031

Abstract

As we all know the fact 'Health is Wealth' so everyone gives the primary priority to health. Patients are now increasingly informed about their health. As a result, there's a necessity for a brand new relationship of shared deciding between patients and health care providers. Providers also must be more tuned in to patient values, preferences, and cultural backgrounds. In today, social insurance structure where patients reside home after operations they are monitored by a medical caretaker or a friend. Many of us nowadays who work full time is face a controversy of monitoring their loved ones especially maturity patients. Health monitoring system using IOT could be a technology to enable monitoring of patients outside of conventional clinical setting which can increase access to worry and reduce healthcare delivery cost. This method facilitates these goals by delivering care right to the house. In addition, patients and their relations feel comfort knowing that they are being monitored and can be supported if a problem arises. Our proposed system to detect the vital parameters of the patient using some sensors and the data which are collected by the sensors is stored using Node MCU. And also the data is transmitted through Wi-Fi module the result will be display on LCD. By the help of login id and password the doctor can see the information of the patient on Ubidots server. And if there is any issues arises the doctor and his/her family is notified by alert message through email, call, SMS and so on.

Keywords: *ECG sensor AD8232, IOT, MAX30100 Pulse detector, UBIDOTS Server, Wi-Fi module.*

I. INTRODUCTION

Health monitoring system using IOT may be a technology to enable monitoring of patients outside of conventional

clinical settings which may increase access to worry and reduce healthcare delivery costs. Patient health

monitoring

uses sensor technology and uses IOT to communicate to the loved ones in case of any problems [5].Consistent with the constitutions of World Health Organization (WHO) the very best attainable standard of health could be a fundamental right for a private. As we seen that almost all of the people clinging to their mobile phones and smart device and connected through internet throughout the day which is shown below in figure 1. Hence with the help of this scenario we think that we have to design a tool which is able to monitor the health of patient. Our proposed system uses sensors that allow detecting heart beat, ECG, Oxygen level using MAX30100 and AD8232 sensors. And uses internet to update the doctors so they will help just in case of any issues at the earliest preventing death rates. Patients relations monitor the patient 24*7 and can be supported if an issue is arises. This project is helpful for reduce the gap between authincated person and the doctor. This system has many benefits like cost-effective, reliable, portable and easy handling which can be easily deployed in home and also on patient's body. As nowadays when we are facing a pandemic. We somehow get afraid to go to the hospital. So this machine can really help us or it can measure and record electrocardiograph, beats per minute (bpm) and oxygen level result anytime and anywhere using IOT. And with this device people will be aware about the importance of heart health.

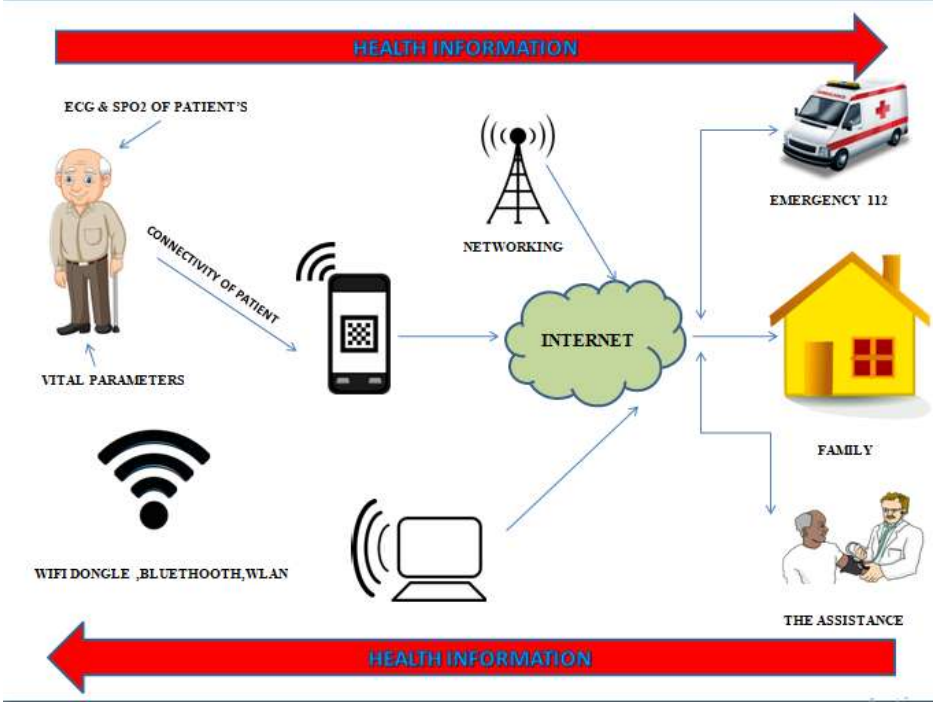

Figure 1 - HEALTH MONITORING SYSTEM

II. IOT IN HEALTHCARE

The healthcare industry is in an exceedingly state of great despair. Healthcare services are costlier than ever. Global population is aging and the no. of chronic diseases are on an increase. Basic healthcare would become out of reach to majority, an outsized section of society would go unproductive because of maturity and folks would be more liable to chronic disease. IOT in Healthcare are shown in figure 2. A replacement paradigm, known as the Internet of Things (IoT), has an in depth applicability in numerous areas, including healthcare. The full application of this paradigm in healthcare area may be a mutual hope because it allows medical centers to function more competently and patient to obtain better treatment .It can at least make easier on a pocket and in term of accessibility. Technology can move the routines of medical checks from hospital patient's home [4]. To improve existing medical systems IoT is applicable. In medical IOT, Wireless Body Area Network (WBAN) is a key concept which is network of autonomous medical sensors which are deployed inside or outside of the patient for health monitoring. [2].

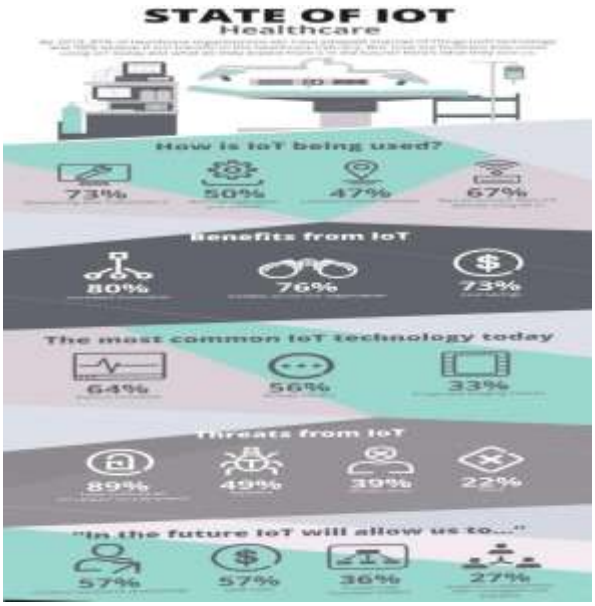

Figure 2- IOT IN HEALTHCARE (https://Fhealthtechmagazine.net)

III. LITERATURE SURVEY

In this present research paper proposes the we have developed an android based mobile data acquisition solution, which collects personalized health information of end user, store analyze and visualize it on the smart devices and Optionally sends it towards the data center for further processing [1]. This system uses Temperature and heartbeat sensor for tracking patient's health. Both the sensors are connected to the Arduino-Uno [5] .So now we have analyzed the health monitoring system using IOT. It will help in providing better diagnosis for the old age's person. As nowadays when we are facing a pandemic. We somehow get afraid to go to the hospital. So this machine can really help us or it can measure and record electrocardiograph, beats per minute (bpm) and oxygen level result anytime and anywhere using IOT. And with this device people will be aware about the importance of heart health.

IV. PROBLEM FORMULATON

We have read many research paper as we mentioned and we found that they uses LM35 temperature sensor and heart beat sensor for measuring body temperature and record pulse rate in bpm.

In this project first we also uses LM35 and heart beat sensor but we work on the sensor so we found that LM35 sensor is used to measure surrounding temperature so we hold that sensor because it can't tell body temperature and when we work on heart beat sensor it does not getting approx bpm value as we wanted. So we replaced the heartbeat sensor to pulse SpO_2 sensor to get approximate value. And after using this we get correct value as we want.

V. METHODOLOGY

In this system we use sensors like AD8232 and MAX30100 which are capable of processing the data of patient's. If we powered NODE MCU with the help of power supply, Node MCU starts working and the sensors starts calibrating. When the patient placed finger on pulse detector sensors the sensor store data of pulse rate and oxygen level. When we put electrode connected to ECG sensor to the patient body and it collect data of patient. After that NODE MCU sends all the data to IOT cloud server called Ubidots and also send data of pulse detector on 16*2 I_2C display. On Ubidots caretaker use id and password of patient to monitor the vital parameters of patient's. if there will any issues arises it gives alert message to registered mobile number, by calling or by message and by email. And After a minute if the condition is normal it also inform by the server.

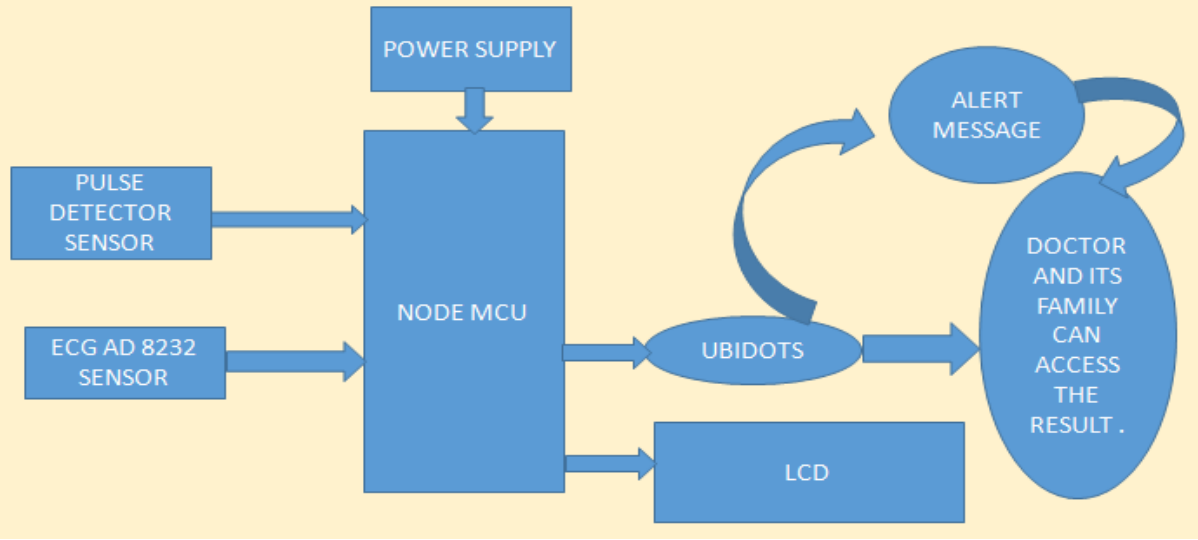

Figure 3- PROPOSED BLOCK DIAGRAM OF HEALTH MONITORING SYSTEM

VI. CIRCUIT DIAGRAM

Circuit diagram of entire health monitoring system is shown in figure 4. In which we debugging all the component like AD8232, MAX30100, I_2C 16 *2 display and NODEMCU with their pins.

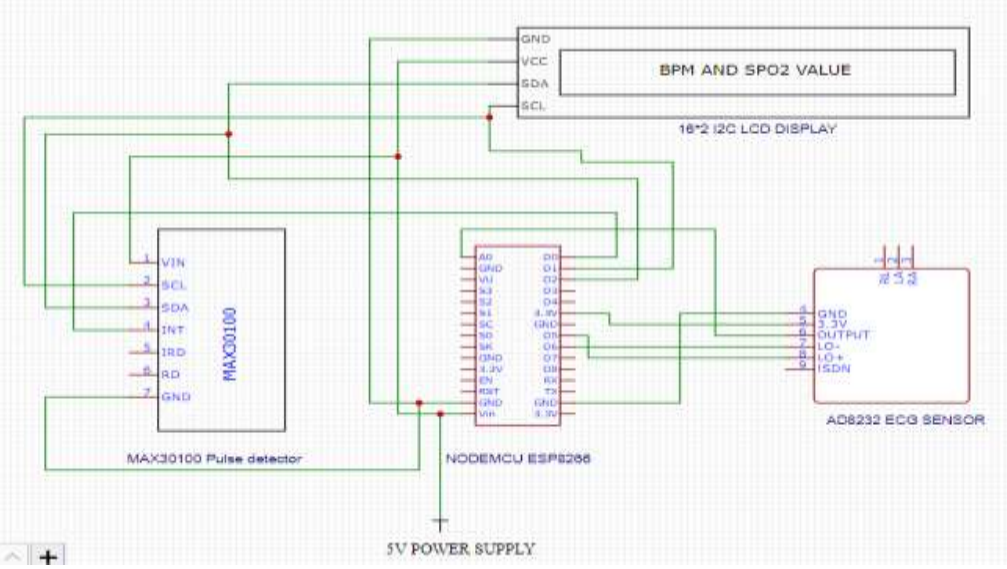

Figure 4- CIRCUIT DIAGRAM

VII. ADVANTAGES AND SOCIAL BENIFITS

a) Integration of different medical instrument on the single system.

b) All the sensors can monitor simultaneously and sends the result to the authenticated person.

c) To make this data available to family members.

d) It will minimize personal cost, easy to use, and this device is portable.

e) As nowadays when we are facing a pandemic .We somehow get afraid to go to the hospital. So this machine can really help us or it can measure and record electrocardiograph, oxygen level and beats per minute (BPM) result anytime and anywhere using IOT. And with this device people will be aware about the importance of heart health.

VIII. RESULT AND OUTCOMES

This is the required result we observe by making the health monitoring system using IoT which is shown in figure 11, 12, 13 and figure 10 is the hardware description of health monitoring system. These figures are shows that how sensors collect the data of the patient then process it and then upload to cloud server Ubidots. On Ubidots server doctor and his/her family members using credential id password to see the information like (bpm value, oxygen level and electrocardiograph). Fig 13 shows that if any issue is arises it will ring the phone by giving alert to the doctor and his family members.

Figure 10 – HARDWARE SYSTEM OF HEALTH MONITORING

Figure 11- MONITORING THE PATIENT ECG GRAPH IN UBIDOTS SERVER

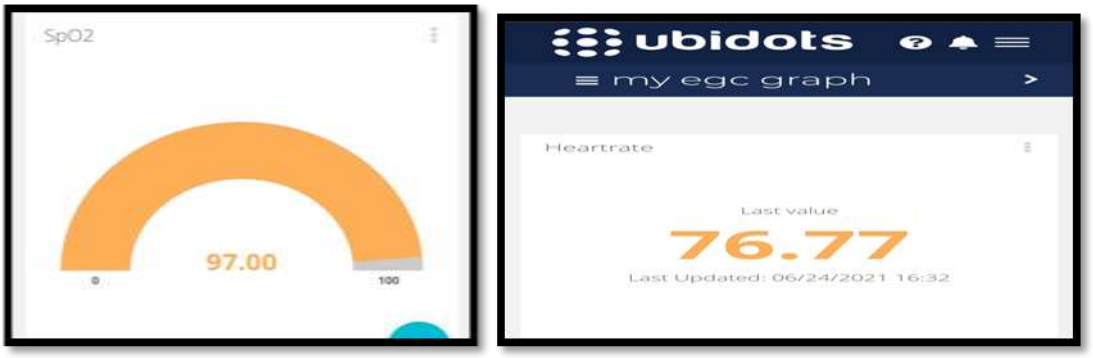

Figure 12- MONITORING THE PATIENT HEART RATE AND OXYGEN LEVEL IN UBIDOTS SERVER

Figure 13 – ALERT MESSAGE OF THE PATIENT FOR THE CARETAKER AND DOCTOR

IX. OUTCOMES

a) In future, this methodology can be implemented by body temperature sensor which tells us about our body temperature. And for use to find location of patient.
b) Basic ECG machines are very bulky and contain heavy equipments and mostly importantly we need an ECG machine operator to run the machine.
c) But now as we are living in a world where the technology is getting advanced day by day.
d) And everything is in our Smartphone and with this thought our aim is to make our patient fit with regular and easy checkup at home.

CONCLUSION

In this paper, we have analyzed the health monitoring system using IOT. It will help in providing better diagnosis for the old age's person. The principle of this paper is to create a tool which will monitor the health of patient. This project is helpful for reduce the gap between authincated person and the doctor This system has many benefits like cost-effective, reliable, portable and easy handling which can be easily deployed in home and also on patient's body. As nowadays when we are facing a Pandemic. We somehow get afraid to go to the hospital. So this machine can really help us or it can measure and record electrocardiograph, beats per minute (bpm) and oxygen level result anytime and anywhere using IOT. And with this device people will be aware about the importance of heart health.

REFERENCES

1. S Lakshmanachari, C. Srihari, A.Sudhakar, Paparao Nalajala "Design and implementation of cloud based patient health monitoring system using IOT". International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS-2017).
2. Sohail Shaikh, Dattatray Waghole, Prajakta Kumbhar, Vrushali Kotkar, Praffulkumar Awaghade, "Patient Monitoring System using IOT". 978-1-5090-6593-6/17/$31.00 ©2017 IEEE.
3. Dr. T. Jagannadha Swamy Mr. T. N.Murthy. "An IoT based Intelligent Health Monitoring and Management System for Mankind". 2019 International Conference on Computer Communication and Informatics (ICCCI -2019), Jan. 23 – 25, 2019, Coimbatore, INDIA.
4. Priyanka Verma, Rajan Mishra. "IOT based smart remote health monitoring system" 2020 International Conference on Electrical and Electronics Engineering (ICE3-2020).
5. D.Shiva Rama Krishnan, Subhash Chand Gupta, Tanupriya Choudhury. "An IoT based Patient Health Monitoring System" 2018 International Conference on Advances in Computing and Communication Engineering (ICACCE-2018) Paris, France June 2018.
6. Bhavana Godavarthi, Paparao Nalajala," Wireless Sensors Based Data Acquisition System using Smart Mobile Application," Internet of things, "*International Journal of Advanced Trends in Computer Science and Engineering*" Vol. 5 No.1, Jan 2016.
7. https://www.mdpi.com/1424-8220/20/6/1695/html
8. **http://Electronicscomp.com**
9. **www.teachmemicro.com**
10. **https://Fhealthtechmagazine.net**
11. **https://youtu.be/OF49FnNMHhw**
12. **https://youtube.be/0y03gqeoMjg**