

IOT BASED HEALTH MONITORING SYSTEM

Alvin Thomas¹, Amal Raju², Amal S Nair³, Gayathri K⁴, Dr. Giby Jose⁵

¹⁻⁴Student Dept. of Electronics & Communication Engineering, SJ CET Palai, Kerala, India

⁵Associate Prof., Dept. of Electronics & Communication Engineering, SJ CET Palai, Kerala, India

Abstract - As we know that the world is in a crisis of covid19 pandemic, due to this nowadays people are afraid to go to hospitals to consult doctors, as there is a chances for them to get infected, so people prefer to choose online consultation. But the problem is that the doctors are not able to do the diagnostics checkups that they usually do at the hospitals on the patients and they are forced to treat patients without sufficient data. This problems is solved by our device as it collects the data required and send it to the doctor.

1. INTRODUCTION

Wellbeing is consistently a significant worry in each development mankind is progressing as far as innovation. Like the new Covid assault that has demolished the economy of China to a degree is an model how medical services has happened to significant significance. In such regions where the pandemic is spread, it is consistently a superior thought to screen these patients utilizing far off wellbeing observing innovation. So Internet of Things (IoT) based wellbeing observing framework is the current answer for it.

Distant Patient Checking plan enables perception of patients outside of standard clinical settings (for example at home), which grows admittance to human administrations workplaces at cut down costs. The center target of this venture is the plan and execution of a savvy patient wellbeing global positioning framework that utilizes Sensors to follow patient wellbeing and utilizations web to illuminate their friends and family if there should arise an occurrence of any issues. The target of creating observing frameworks is to lessen medical care costs by diminishing doctor office visits, hospitalizations, and indicative testing system.

Every one of our bodies uses temperature and furthermore beat recognizing to scrutinize getting prosperity. The sensors are connected to a microcontroller to follow the status which is in this manner interfaced to a LCD screen and moreover distant relationship with have the ability to trade alerts. On the off chance that system tracks down any unexpected changes in getting heart beat or internal heat level, the system thusly alerts the bystanders about the patients status

And moreover demonstrates unpretentious components of heartbeat, oxygen level and temperature of patient live in the web.

1.1 Objectives

Our goal is to make online consultation of doctors more efficient and reliable. Also to make the physical measurements of a patients health in a remote area visible and accessible to the doctor.

1.2 Target users

The primary users of our device are aged patients between the age of 50 to 80 and also paralysed patients of all age as they are morely affected by the current situation. The secondary users of the device are the bystanders and the doctors.

2. Literature Review

In earlier days patient's health was monitored by catching his/her hand to check their pulse rate however these days technology in medical field is in advance level and helps for the simple observation of a patient's health using various sensors and other technology. The introduction of IoT was one among them.

IOT is one of the thriving field in impending years and assumes a significant part in the field of medical services. Health care applications are one of the most important applications of the Internet of things. IoT has been used in medical field for various purposes[1]. IOT helps in interfacing individuals by engaging their wellbeing and abundance in a keen manner through wearable contraptions. Ongoing improvement in remote sensor networks have made a recent trend in Internet of things. Better wellbeing is significant application in internet of things. Patients with medical issue can be immediately observed through this medical care framework and give a quick answer for the patients. This sort of arrangements can be experienced through wearable devices that constantly screen the action and state of the patient in an anticipated strategy. The principle point of this work is to give a broad exploration in catching the sensor data's, dissecting the information and giving an

input to patients bystanders and consulting doctors on various wellbeing boundaries[4].

Wide research is being done in the exploration of technologies in strengthening the health services. Many IoT-based smart healthcare devices and systems are commercially available nowadays. These products are useful for the tasks such as monitoring patients, maintaining contacts with doctors, improving the performance of rehabilitation, etc[2].

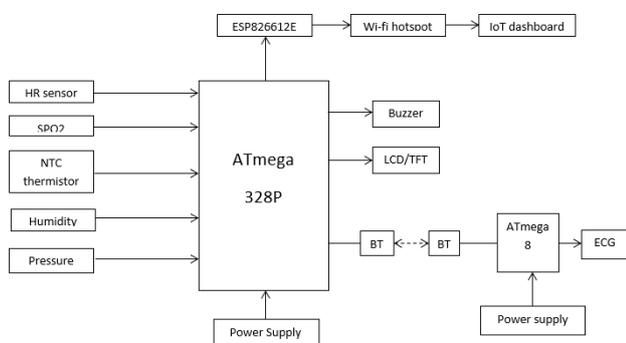
There are many systems related with health monitoring which are one way or the other beneficial to the users. Many devices are proposed in recent years with lots of features, But are they all reliable, cheap, and easy to use like prototypes ? . It is because of the components used for the fabrication. So, in an attempt to solve these issue, we designed a device which is capable of monitoring body parameters of patients.

3. Proposed system

After analysing our objective carefully and after several discussion we decided to tackle this problem by creating a wearable device, which could measure the real time health measurements of the patient and make it visible and accessible to the doctor. The device also displays necessary information to the patient too, so that they can regularly monitor their health.

Our system monitors the temperature, SpO2, heart rate along with the ecg of the patient in real time and displays it in the software. We also measure the surrounding parameters like temperature, humidity and atmospheric pressure to find whether they influence the patients condition.

3.2 Block Diagram of Proposed System

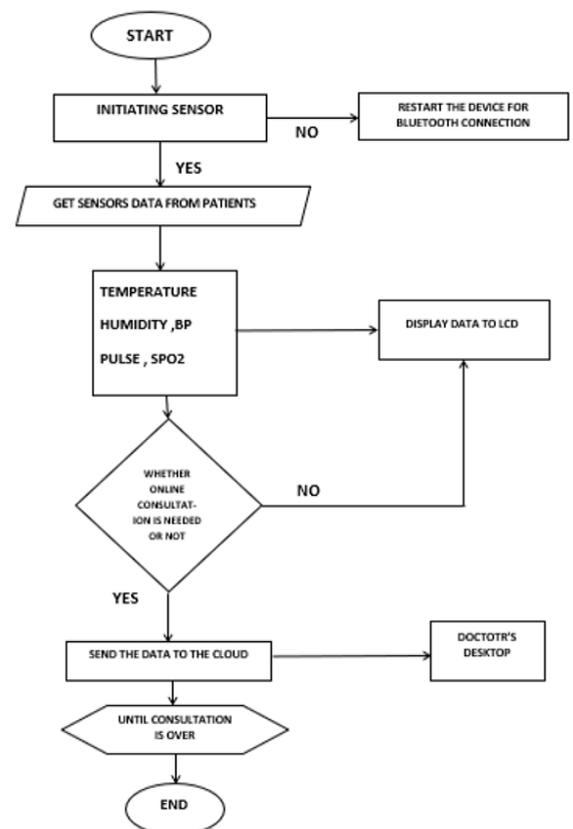


Our device consists of two parts , one is specifically for the ecg measurement and a main part which consist of the sensors and all the processing takes place in it. The ecg part is connected to the main part through bluetooth, It is done inorder to avoid the inconvenience

(as there is possibility to accidentally disconnect the attachments as the patients move around) of the patients and also to measure the ecg more reliably.

The main part consist a total of five sensors, they are an HR sensor, SpO2 sensor , temperature sensor for the patient and an humidity, atmospheric pressure and temperature sensor for analysing the surrounding conditions of the patient so that the doctor could understand whether it is affecting the patients condition. The device also send off an alert when the temperature of the patient increases above the normal level.

4. System flow chart



5. Algorithm

Step1: Initializes both transmitter and receiver section and establishes Bluetooth connection between the systems.

Step2: The AD8232 sensor collects the ECG values of the patient and the data is passed to the microcontroller ATmega 8 in the transmitter section. And the data is send to the receiver section via the already established Bluetooth connection.

Step 3 : Real time pressure value is sensed by the biometric pressure sensor BMP 180 which is a piezo resistive MEMS device. The data is collected by the

microcontroller ATmega 328 and is serially printed in the TFT display.

Step 4: The atmospheric humidity is sensed with the help of DHT 22 sensor and the value is serially printed in the TFT display.

Step 5: Heart beat of the patient is obtained with the help of Max 30100 pulse oximeter sensor. Also the amount of oxygen content in the blood is measured. Both the data is printed on TFT display.

Step 6: The real time temperature of the patient is monitored by using temperature sensor and the temperature value is serially printed on the TFT Display.

Step 7: All the data collected by ECG sensor AD8232, BMP 180, DHT 22, MAX 30100 and Temperature sensor are pushed to the IoT platform by the ESP 8266 IoT module.

6. CONCLUSIONS

As healthcare facilities age and operating costs rise, there is a need to go beyond usual cost-cutting techniques while ensuring good patient outcomes. Our project showcases a new method of consultation, where the doctors are unable to consult their patients. The project mainly focuses on those patients who are unable to consult their doctor. The project comes with a device which can collect the measurements such as SpO2 level, body temperature, heart pulse, body pressure, ECG and room humidity. These measurements are then processed and are displayed on the LCD display (for the bystanders to view), at the same time the reading are pushed to the IOT dashboard through the wifi module. The doctor can view the real time measured value of the patient and also it is made possible to view the previous checkup status and the details of the patient so that any minute changes can be consulted easily.

REFERENCES

[1] Z. Zhiao, Chnaowei and z. Nakdahira, "Healthcare application based on Internet of Things", Proc. IEET Int. ConfE. on. Technolgy. Application., pp. 661-662, Nov. 2013

[2] Yin, Y., Zeng, Y., Chen, X., Fan, Y.: The Internet of Things in healthcare: an overview. J. Ind Int. Integr. 1, 3-13 (2016)

[3] M. Sathya, S. Madhan, K. Jayanti: Internet of things (IoT) based health monitoring system and challenges, 2018

[4] S Ananth, P Sathya, P Madhan Mohan, Smart Health Monitoring System through IOT, 2019 International Conference on Communication and Signal Processing (ICCSP), 2019

[5] <https://how2electronics.com/ecg-monitoring-with-ad8232-ecg-sensor-arduino>