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"AN IOT ENABLED SMART HEALTH CARE KIT: REVIEW"

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Abstract: *Nowadays due to busy and hush lifestyle people tend to ignore their health also due to this lifestyle people don't have time to take care of their loved ones especially parents and grandparents It is a hope to perform checking of the wellbeing state of a patient with so amenities and every day exercises this system provides such facilities which is hand on to use and with accuracy with the help of IOT and hardware used IOT is a wireless network connecting different devices to share, record, analyze the information IOT plays the vital role in this system to be a success hence patients data such as heart rate, blood pressure, ECG etc. and transfer accordingly this system is a onetime investment to the health of an individual person in day to day life.*

Keywords – *(Internet of Things (IOT), Health monitoring, Health Parameter,* Raspberry Pi, *Sensors.)*

I. INTRODUCTION

In IOT there are numerous gadgets are associated with one another for correspondence reason it shares the information, data and ready to deliver new data and record it for future reason. Ordinary individuals require new gadgets, new innovation for make his life simple. The examination is consistently attempting to think on new gadgets for make his life simple. In our everyday life we are confronting numerous issues identified with our wellbeing since we are not thinking about ourselves. Thus, to lessen these issues we are presented an IOT Based Smart Healthcare Kit.

This framework is valuable for everyday citizens to gauge and observing like, temperature, ECG, heart beat rate etc. & the outcome is recorded in INTEL GALILEO BOARD and show on LCD.The specialist can login to this site and see that result. This framework utilized sensors and actuators for get the information from patient and record it. This framework is give better yield and it is less exorbitant.[1]

The fundamental vision of the medical services industry is to give better medical services to all the individuals anyplace and whenever in the world. This ought to be done in a more patient neighbourly and financial way. Along these lines for expanding the patient consideration productivity, there is a need to improve the patient observing gadgets. The clinical present reality faces two issues in quiet observing; initially, the need of medical care suppliers also, overseers to be available at the bedside of the patient and second is that the patient is limited to bed and is wired to huge machines. So as to accomplish adaptable and agreeable patient consideration, the previously mentioned issues ought to be explained and as the bioinstrumentation and broadcast communications advancements are propelling, it has gotten more possible to plan a home based crucial sign checking framework to accumulate, show, record also, send the physiological information from a human body to any area. The proposed system uses IoT and distributed computing for seeing of person's prosperity using sensors. The IoT enables the relationship of contraptions around us to web by methods for distant and wired correspondence developments. These sensors can be used to accumulate particular kinds of data, for instance, internal heat level,

beat, fall acknowledgment and geo fencing, which are related with surface of the person's body. These data are furthermore shipped off cloud for estimation. As and when these computations are done there is a pre-set limit set for each sensor and if any oddity found while figuring data in cloud a notification, than their will be further divided into three cases as per the data frequency is set to the cloud and accordingly it will gives some do's and don'ts and the notification is shown to the patient screen and data is sent to the guardian of the individual and to the closest hospital or family doctor.[2]

II. BLOCK DIAGRAM

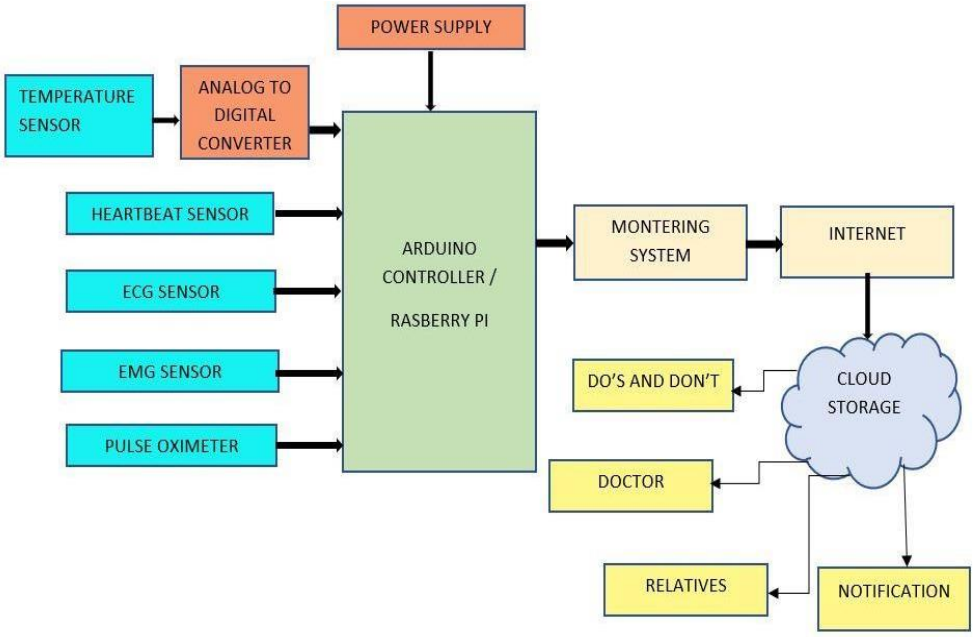

Fig. 1: Block Diagram of an IOT Based Smart Health Care Kit

We are proposing the system according to the revise of prose survey. This system comprises of the hardware apparatus that makes it IoT enabled and is second-hand to document the health parameters of the uncomplaining by a range of sensors. This sensors detects the body temperature, ECG, EMG and Heartbeat. And also an analog to digital converter is connected in order to convert analog value into the digital .Then this sensors are connected to Arduino controller /Raspberry Pi .A power supply is given to the system after that internet acts as a server. Through cloud computing everyone know what's the patient's health reputation somewhere in the globe by laptops, drug and smartphones. If these parameters goes abnormal it will certainly sends alert SMS to the doctors and relatives. And also gives some do's and don'ts to be formed during that situation.[6].

III. EQUIPMENT NEEDED

3.1 HARDWARE:

Heart rate sensor: sensor 11574 using this heart rate is measured

Fig.2: Heart Rate Sensor 11574

Temperature sensor: The LM35 is an IC hotness sensor with an output voltage which is proportional to the Celsius

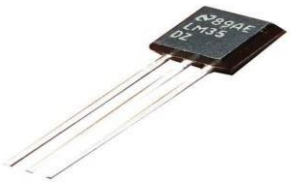

Fig.3: Temperature Sensor LM35

Temperature. These leading skin texture of the LM35 sensor make interfacing to any capture of course exceedingly easy.

ECG sensor: The ECG is measured using AD8233

Fig.4: ECG Sensor AD8233

EMG sensor: The EMG is measured using EMG V3.O

Fig.5: EMG V3.O Sensor

Pulse Rate sensor: The Pulse Rate sensor which can be used is MAX3010

Fig.6: MAX3010 Sensor

Arduino boards: Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

Fig7.Arduino Board

Raspberry Pi: The Raspberry Pi is a bank card size microcontroller with the features of a small pc and is extremely popular for development purposes because it offers the entire Linux server and peripheral device connectivity on a single chip and is very cost-effective.

3.2 SOFTWARE:

Raspberry Pi OS: Raspberry Pi OS comes pre-installed with plenty of software for education, programming and general use. It has Python, Scratch, Sonic Pi, Java and more.

Arduino IDE: Arduino IDE is an open source software that is mainly used for writing and compiling the code into the Arduino Module.

IV. METHODOLOGY

In this we have followed the following methodology it consists of three cases. This cases will be based on the standard values of the body parameters. Standard values of the body parameters are given as follows:

Sr.no	Parameters	Standard value
1	Heart rate	60 to 100 BPM
2	Temperature	36 C to 38 C
3	ECG	120-200 ms
4	EMG	30-50 uV
5	Pulse Rate	95 to 100 %

Table No. 1.Health Parameter Standard Values

Case 1: If the value measured is between the standard value then the system will give the health status and show the notification that your health is perfectly fine.

Case 2: If the measured value is fluctuating that is the value is above or below the standard value then the system will give alert that your body parameter has increase or decrease along with it it will give the do's and don'ts to bring the body parameter back to normal.

Case 3: But if the measured value is totally gone different from the standard value then the system will give you and your relatives and also your doctor the alert that there is a health issue with the patient and also give the location of the patient.

4.1 Flowchart

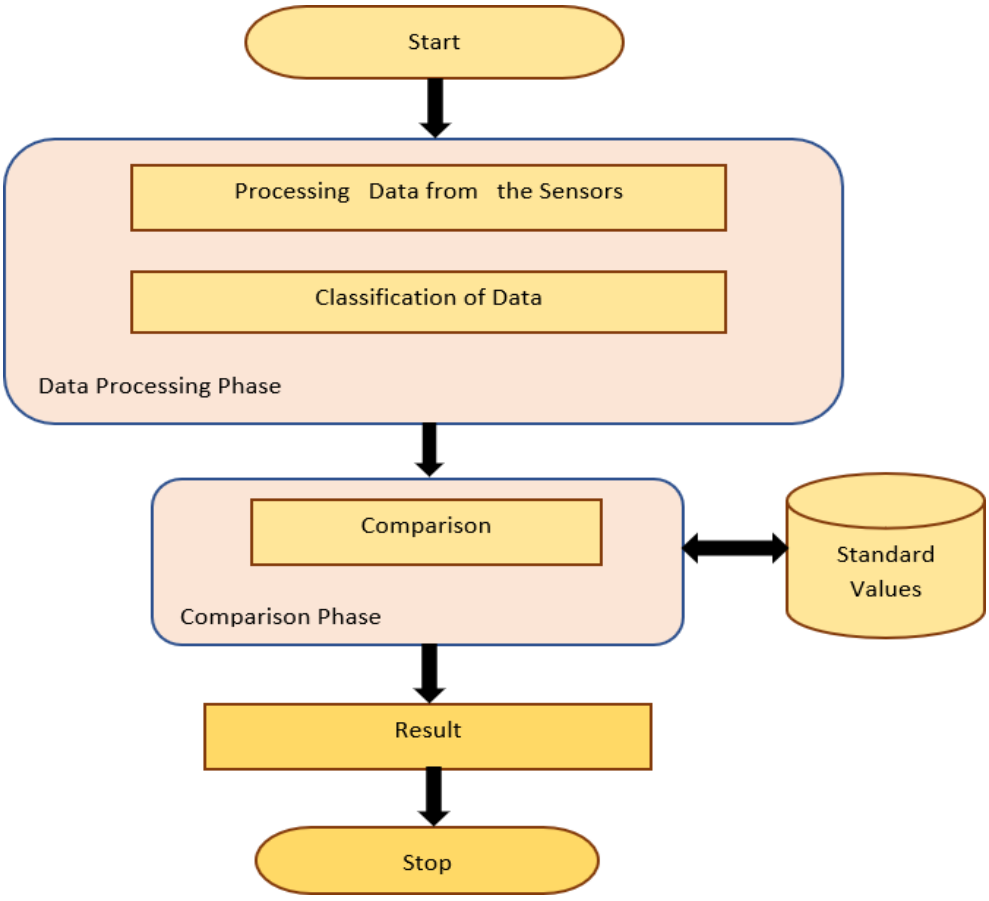

Fig.8: Flowchart of an IOT Based Smart Health Care Kit

The Flowchart shown above consist of two phases:

1. Data processing phase. In this phase there are two stages processing data from the sensor: in this stage the data is collect from the sensors, this parameter ass data is nothing but the measured value of the body parameters. Classification of data. In this the data is classified that the values of various parameter are been classified accordingly.

2. Comparison phase: Here the measure valued is compared with the standard value and then in the result one of the 3 case will be given depending on the value. For example if the standard value for temperature of a body is 37 degrees and the output from the sensor is also 37degree or in that range then it will compare it with standard value and will give the result as the human is perfectly fine [7].

V. RESUTS

These are some results performed by us with three sensors below:

1. We declare modestly interfaced Arduino with LM35 to compute the high temperature in Centigrade scale. The high temperature is immediately displayed on 16*2 LCD. LM35 is a precision centigrade fever sensor. The output voltage of the sensor is soon proportional to the hotness in centigrade.

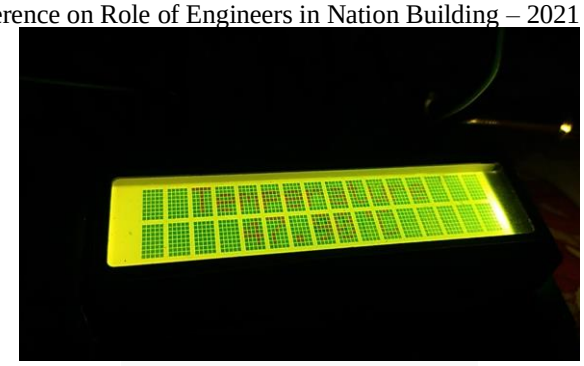

Fig8: output from LM35 on LCD

The above figure shows temperature of a body which is 47.90 slight higher than usual as the person was having little high temperature on LCD interfaced with sensor and Aurdino uno

2. We have interface AD8232 ECG heart rate monitor sensor With Arduino UNO/Mega and observe the graph in the serial plotter.

Fig 9: output on serial plotter from AD8232

The above figure shows the graph of heart's electrical activity namely the of P, Q, R wave which measures Heartbeat of person

3. We have interface Electromyography (EMG) sensor V3.0 With Arduino UNO/Mega and observe the results in the serial monitor.

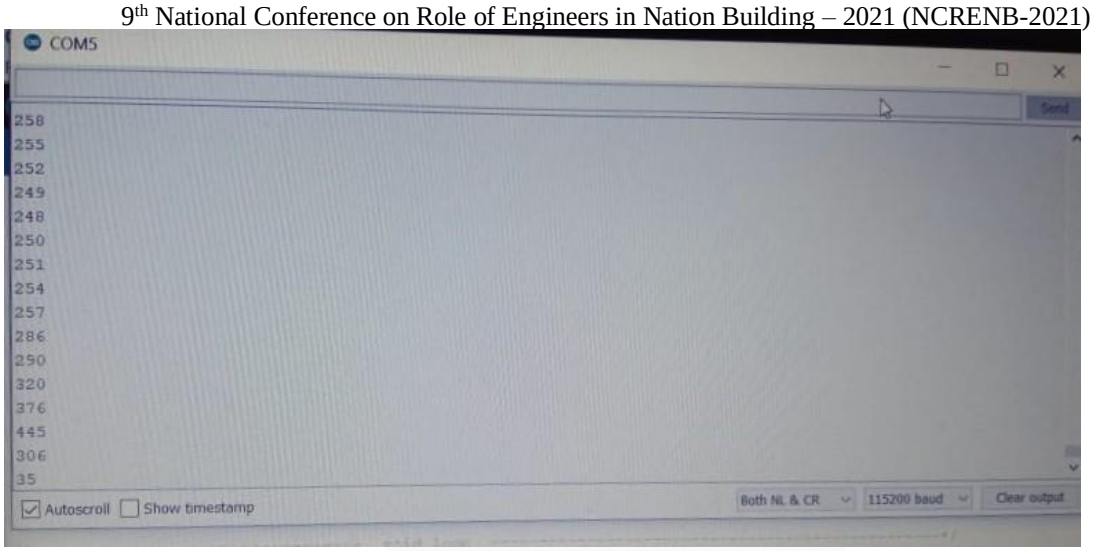

Fig 10: output on serial monitor from V3.0

The above figure shows the values of movement of muscles from a human right hand on serial monitor of Aurdino Uno

VI. CONCLUSION

In this paper, the requirement of regular health monitoring for well-being is discussed and a smart health monitoring gadget dependent on IoT and wearable segment that will screen how to continuously regulate a person's health status is proposed. It shows an automatic system that guarantees a constant monitoring of various health parameters and prediction of any kind of disease or disorder that prevents the patient from the pain of paying frequent visits to the hospitals. It is a simple, low-cost controller based smart healthcare kit for home. The main idea of this system is to provide better and efficient health services for the patients by implementing a networked information cloud so that the experts and doctors could make use of this data and provide a fast and an efficient solution.

The system will be very helpful for future use as it is easy to use and very effective. Every family can have their own kit and will be able to monitor their health anytime anywhere. The gadget can be further improved by artificial intelligence. The data, consisting medical history of many patients' parameters and corresponding

Results, can be explored using data mining, in search of consistent patterns and systematic relationships in the disease. The system will ease the efforts needed to check blood pressure, heart beat rate, temperature etc. It can also be used in hospitals for fast and pocket-friendly check-up and video monitoring could be used for monitoring patients.

We conclude that the best sensors to use are the temperature sensor LM35 for calculating temperature of an individual, heart rate sensor 11574 for calculating heart rate of person, For cardiac activity ECG sensorAD823 is used, EMG sensor: EMG V3.0 can be used for electrical activity of muscles, Pulse Rate sensor MAX3010 can be used for calculating pulses of an individual, best software to use is Raspberry Pi OS.

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