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IOT AND ANDROID BASED REAL TIME PATIENT HEALTH MONITORING SYSTEM USING RASPBERRY PI

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ABSTRACT: The Internet of Things (IOT) is an emerging paradigm for the range of new capabilities brought about by pervasive connectivity. The concept involves situations where network connectivity and computing capability expand to objects, sensors, and everyday items that exchange data with little to no human involvement. The premise of the IOT is to build, operate, and manage the physical world by means of pervasive smart networking, data collection, predictive analytics, deep optimization, machine-to-machine methods, and other solutions. Its potential benefits can impact how individuals live and work. In the near future, corporate and government organizations, such as the U.S. Department of Defence, may be challenged by the inevitable addition of IOT devices to their networks and connected systems. This notion will serve as a source of innovative decision making.

Key words: Raspberry PI Microcontroller, Temperature Sensor, Heart Beat Sensor, ESP8266 IOT Module, System, MEMS Sensor.

I.INTRODUCTION

Wearable technology has made significant progress in recent years, with millions of devices being sold to consumers and steady advances being made in technological capabilities. Although the form and function of contemporary wearable have changed from Shannon and Thorpe‘s 1961 experiment, many of the same conflicting design issues have to be taken into consideration when developing modern technologies that are intended to be worn.

Al- though wearable have benefited from advances in mobile technologies, functionality remains limited compared to smart phones. Additionally, smart phones do not need to be comfortable to wear while in motion, are less restricted by weight and size requirements, and have more well-defined aesthetic requirements. However, wearable‘s present a tremendous opportunity for capturing a continuous stream of data about our physiology and kinesiology, which can empower consumers with self-knowledge. Human health and fitness are areas in which wearable can offer insights that smart phones cannot. This is evident from the immense popularity of fitness trackers (e.g., the Fit bit Blaze, Jawbone UP, and Nike+ Fuel Band) and smart watches (e.g. The Apple Watch and Samsung Gear) being used by consumers to self-monitor physical activity. Additionally, wearable are being used for self-monitoring and preventing health conditions such as hypertension and stress. Donald Jones with the Scripps Translational Science Institute says, ―My favorite we arable to-day are those that measure blood pressure and that

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can be used to impute stress. I think these are some of the most interesting areas of feedback that we have today. Hypertension is a cause of many illnesses, and stress is obviously a big contributor‖. Research continues to explore how we arable can help patients and physicians before, during, and after medical procedures, such as surgery. For example, telemedicine can be performed by on-site paramedics wearing Google Glass, a head-mounted display with a camera and mi- crop hone, and communicating with off-site medical doctors to provide expert care during disaster relief efforts. Ad- additionally, wearable‘s can pro- vide a more expedient means of monitoring a patient‘s vital signs during surgical procedures by reducing the sizes of equipments and number of wires leading to external devices. Such applications improve the quality of medical. Even so, many issues need to be taken into consideration when deploying wearable‘s for general health care. For example, John Fenland, chief executive officer of Argus In- sights, says, —People get tired of the fitness bands and throw them in the sock drawer. They stop being useful, people lose their fitness momentum. Furthermore, data security and privacy are primary concerns for both patients and hospitals. Therefore, new technologies need to be integrated with devices and systems already in place, and approval by regulatory agencies can take years and millions of dollars before benefits are realized.

II. PROPOSED SYSTEM

The below figure (1) shows the block diagram of proposed system. Then components used in this block diagram are power supply, temperature sensor, heart beat sensor, ECG sensor, paralysis sensor, raspberry-PI micro controller, MAX-232, WIFI module and android mobile. Let us discuss each component in detailed manner.

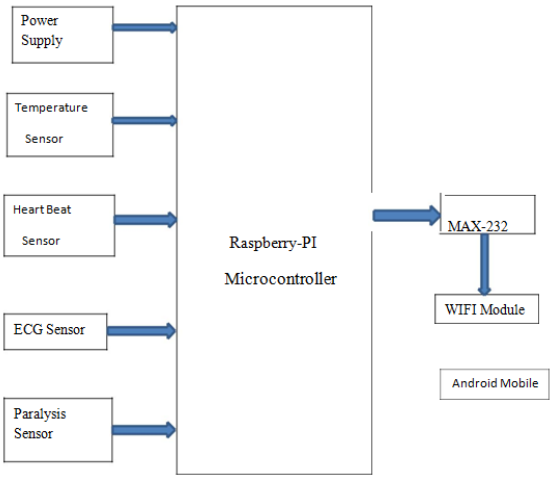

FIG. 1. PROPOSED SYSTEM

Power supply:

Generally an unregulated power supply ranges from 9v to 10v dc supply. In this KA8705 voltage regulator is used to make 5v power supply. Here KA8705 will connect the positive lead from unregulated DC power supply to input pin and in the same way it connects negative lead to common pin. The 5 v power supply is obtained from the output when optimization techniques are applied.

Raspberry-PI micro controller:

A micro controller is a computer control system which is placed on a single chip. In micro controller there are number of circuits which are integrated with each other. The main intent of the micro controller is to decode the given instruction and convert them into electrical signals. It executes in a

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step by step procedure. In this to perform some functions, some of the instructions are used to wire the gates electronically. Now the list of instructions given to microcontroller is called program. Different types of micro controllers are used in the projects, but here we are using Raspberry PI micro controller.

LM-35 sensor:To read the temperature of room we use a sensor that is LM-35 sensor. As we know that temperature is measures in centigrade's or Fahrenheit. The output of this sensor is obtained in degrees centigrade.

Heart beat sensor:

Depend upon the IR principle heart beat sensor works. Here when we keep our fore finger into the sensor then it counts the heart beat during on time. After this process we need to wait for 60 sec to collect heart beats of human beings. The output which is obtained digitally is connected directly to the micro controller to measure the beats per minute rate.

ECG sensor:

First ECG sensor is connected to the body, after connecting it will collects the maximum beat of heat. Depend upon those values we will plot the graph.

MAX-232:

Generally, MAX-232 is an integrated circuit which converts TTL logic levels to RS232 logic levels. This process is done during the serial communication of micro controller with PC. Here it is difficult to establish a direct link to communicate with each other.

WIFI module:

In this we use ESP8266 module which is low cost and it is suitable for adding WIFI functionality. This module is reprogrammed to act as WIFI connected device.

Android module:

It is a mobile operating system developed by Google. Basically, android user interface depend upon the direct manipulation. Recently Google has developed an option for androids they are given as android user, android TV, android auto cars by using user interface.

III. RESULTS

In this we are using a Raspberry PI Microcontroller for connecting the sensors like Temperature Sensor, Heart Beat Sensor, IOT module Temperature Sensor will calculate the room temperature which is very important for asthma patients whenever the temperature increases more than the room temperature then it will provide a buzzer sound in order to intimate that temperature is increases/decreases.

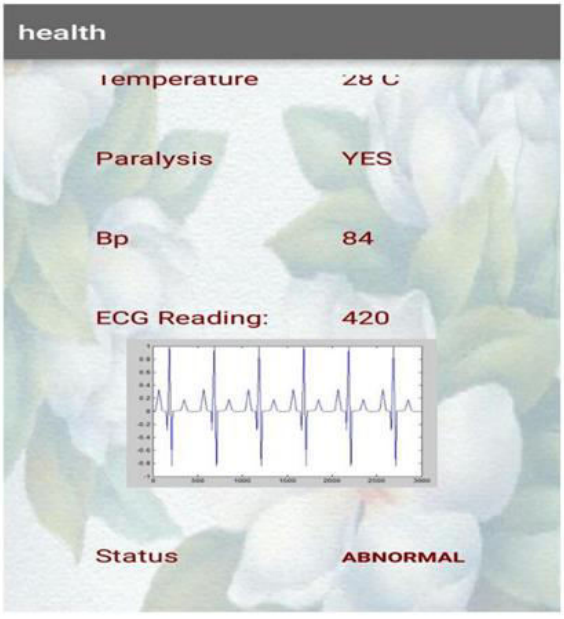

FIG.2. MOBILE APPLICATION FOR PATIENT MONITORING SYSTEM

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IV. CONCLUSION

The IoT is a potential emerging solution that consists of interconnected devices. These networked devices offer better, faster, and cheaper customer-driven innovations in health care consumption as well as provision. Networked wearable devices and apps play an integral role, serving as the foundation to the ever-evolving practice of the IoT in health care. Daniel Kraft of the Aspen Institute believes that apps and their IoT connections may begin supporting clinicians‘ workflow.He says, As the incentives are aligning and value-based care comes together, the future will be the IoT that blends with wearable devices, apps, and smart analytics on top of data. This is so the clinician and care team can get the right insights from the data at the right time and not be overwhelmed.Smart preventative decisions can be made for a more proactive individualized electronic engineers will be at the forefront of building next-generation solutions. There may be a substantial increase in things like embeddable small and easily powered microchip implants that can be placed anywhere within a person‘s body. In terms of the health care sector, they may be able to measure vital signs without invasive surgery. Embeddables, such as electronic tattoos, for example, may be equipped with sensors that can transmit through wireless technology. Also, three-dimensional printed medical devices are very promising additions to the IoT, in that every object implanted in the human body may be scannable or trackable through networks.

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