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HEALTH MONITORING SYSTEMS

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Abstract: **-** This document describes the planification and implementation, with the support of an ESP8266 Development Board, of an IOT-based health monitoring service. In real time, data streams will be collected and analyzed to help users understand health risks and cost savings. The proposed model allows users to reduce health risk by collecting and sharing large volumes of data in a reliable and efficient manner. The patient should not go to the doctor if he needs to examine his vital signs, heart rate, temperature, etc. This proposal enables patients and physicians to save time and doctors can offer the greatest possible level of assistance in emergencies. The project will be able to provide patients with proper and effective medical services by connecting and gathering data through health status monitors which might include patient pulse, vital sign and ECG. It can also provide the patient with its current status and complete medical information with an emergency warning. Both patients and doctors can save time with this proposal and doctors can offer maximal support in emergencies. The project will be able to offer patients effective medical services through medical monitoring devices, which may include the pulse of the patient, vital signs and ECG, by connecting and collecting data. It can also send an emergency alert and complete medical information with its current status to the patient.

I. Introduction: -

In acquiring and exchanging major data from networked systems, the Secure Service Layer defines the IOT. In short, the IOT can be defined as the connected device wireless network to exchange information. Data sharing and communication and information creation for future use in registration and analysis. By means of central objects, the Internet of Things builds its full potential. Included in the devices are smart meters, sport shoes, intelligent cameras and intelligent video cameras. Smartphone apps also help to keep alarms and emergency services on medical record in real time. Devices generate large amounts of information and data, which are processed by suppliers effectively and therefore very difficult. In order to meet the challenges of saving and analyzing big data, Internet of Things Analytics (IoTA) technology is used. It is useful for raw data. Convert data using techniques that are medically relevant, such as data mining and data analysis. Smart sensors are employed for measuring, monitoring and analyzing many indicators of health conditions such as pulsation and blood pressure; oxygen content; and blood sugar; a number of medical indicators are measured, controlled, and analysed. Intelligent sensors and pill bottles connected to a network can be integrated and warn if a patient has taken a planned dose of In IoT healthcare there are a number of important advances and changes. The way we communicate and interact with people and other devices changes and improves every day.

The IoT now enables raw data to be collected in real time from an unlimited number of patients through intelligent devices connected to a networked network over a continuous period of time. It takes some time to fully understand the technology. Diagnostics and critical tasks are better and more reliable for medical experts. This all means that you will not only be able to obtain reliable results, but also save time. Things' Internet (IoT) has virtually unlimited potential and continues to evolve. An IoT-based medical monitoring

system that collects the patient's full medical information, including heart rate, blood pressure and EKG, would send alerts. This document seeks to find a better and more robust solution to this challenge.

II. Proposed System

The main goal of this project is to design an intelligent health monitoring system for patients. The overview of the system proposed is shown in Fig.1. In order to feel the temperature and heartbeat of the patient, the sensors are integrated on the patient's organ. The humidity and the temperature of the room in which the patient resides are felt by two more sensors at home. These sensors are attached to a controlling unit calculating all four sensors' values. These values are then sent to the base station via an IoT cloud. The values will then be accessed by the doctor from the base station at any other site.

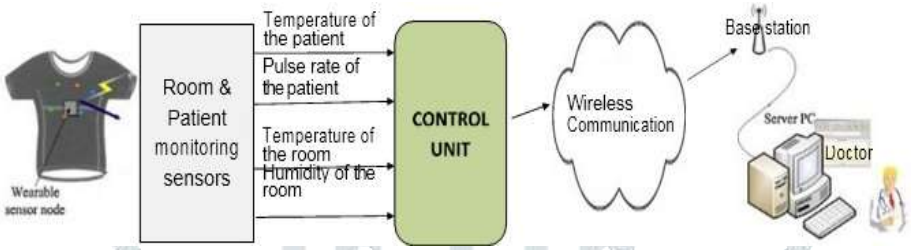

Fig. 1: Proposed System

Sensors

With the ADC, the temperature sensor connected to the Arduino analogue pin will become a digital value. The controller converts the digital data in the current degree Celsius temperature value with the equation:

[raw value of ADC*5/4095- (400/1000)] Temperature (°C) *(19.5/1000)

The sensor is based on the photo-plethysmography principle. It measures blood volume changes via any organ in the body that causes light intensity changes through this body (a vascular region). A microcontroller for the calculation of the thermal rates is provided with the digital pulses provided with the formula: With the ADC, the temperature sensor connected to the Arduino analogue pin will become a digital value. The controller converts the digital data in the current degree Celsius temperature value with the equation:

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IoT Server

At any point in the healing centre, the physiologic signs are sensed by the sensors and these signs are changed in electric signals [8]. Then the simple electrical flag (Computer information) is changed into advanced flag (RFID). For this framework it is appropriate to transfer computerised information to the neighborhood Zigbee server using the Zigbee Protocol. It consists of the most cell hubs. It is more advantageous for smaller gadgets, which give less vitality. The information is exchanged from the nearby server via WLAN to the therapeutic server. As shown in Table I, the medical server includes a significant database. The server then checks whether the patient has a medical history, when the information is exchanged to the therapeutic server, adding new information and exchanging it to the specialist. If a patient has no therapeutic record in the past, the server will make a new ID and store the data in the database. These data are shared with the diagnostic specialist. Fig. 2 shows the full IoT-based data transmission.

III. DISCUSSION AND EVALUATION: -

The problems that have evolved have often not been detected as a minor heart attack and consequently further consequences arise. Many research papers were written on the matter and different devices were constantly developed in order to address this serious health problem as soon as possible. Continuous patient monitoring was a challenge because it prevents that patient from moving, with a primary focus on every person. Not only does the massive wired machine prevent people from moving, it also causes an individual to be mentally disturbed by the wires. History: Some of the systems have been examined and certain deficiencies have been identified

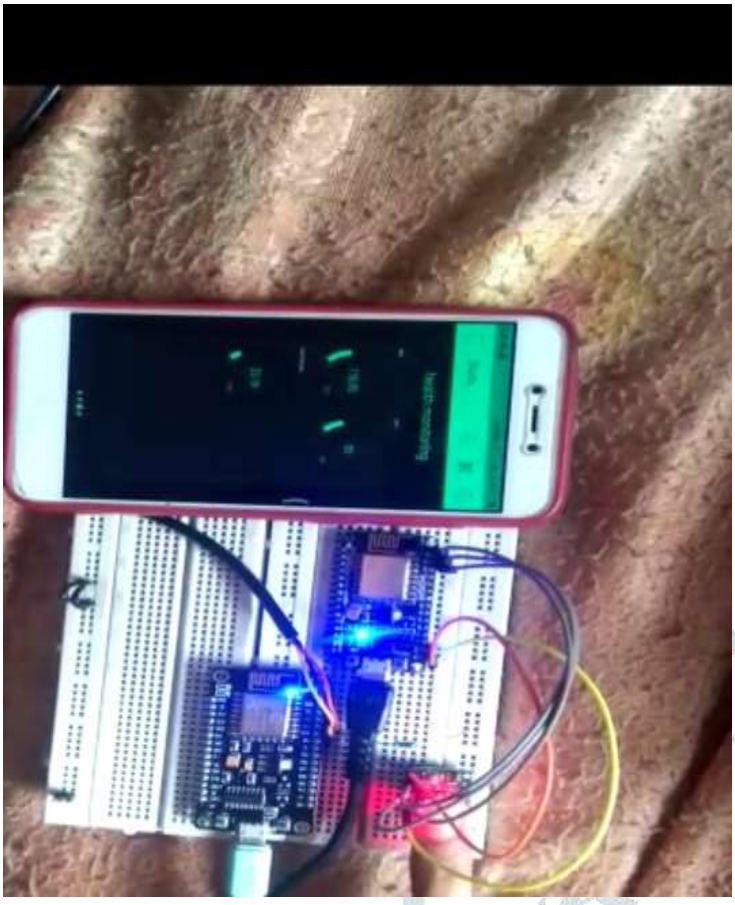
- . The study[1] uses the electronic health sensor platform to monitor health data. The architecture has been divided into three modules that monitor the patient's health remotely by means of sensing modules, principal module and an interaction module using the cloud.
- Sensors like the glucometer, airflow and accelerometer have been applied in the proposed system described in [2]. They focused mainly on cost-effectiveness. The body, which send the data by cloud with zigbees, is fitted with medical sensors as described.
- An additional study on the "real-time, mobile health monitoring app" is a smart telephone-based system that monitors parameters of human health.
- A further apparatus is [5] Health surveillance system consists of a blood pressure sensor, a heartbeat sensor, a lcd, amplified, a GSM module and a microcontroller. Two devices are built-in, one using the GSM and the other using RFID. The third device is FPGA which sends the data transmitted serially to the fixed control station consisting of a LabVIEW GUI PC (Graphical User Interface). Previously used microcontrollers have been monitored in the cardiovascular systems, and after two hours, the report had been sent to the doctor. This device had a drawback because there was a certain time frame set beyond which if a minor heart attack occurred before that 2-hour duration then the report would be sent at its own time which would not solve the problem which we are looking at as proposed in [7].
- The study [9] described in another study supports end-user experience. The Bluetooth module incorporates the 3AHCare monitoring system for ECG, blood pressure, oxygenation of blood, respiration and temperature measurement. With the Android app, this device works as an interface of 3G or WIFI between smartphones and apps. There is therefore no need for communication between devices. Wireless temperature and health surveillance with Zigbee is another device. A transmitter and a recipient would contain this device. ADC, Clock, ZigBee modem would be included in the transmitter. The sender transmits the data to be converted via zibmee. The finger is collected using LED and photo resistance. The data is collected. Not mobility-friendly since it's an enormous display device.
- The items shown in [12] help to monitor physiological and cinematic parameters. It is only designated for the elderly. It uses GPRS for transmitting sensor data as an interface. Parameters like SpO2 and cardiac rates are the main focus. There is no flexible topology system for the network.
- A further study of 'smart mobile health surveillance system' suggests how mobile devices can be integrated and monitored seamlessly in healthcare services.The shortcoming is that the collected data doesn’t represent only the informative data which makes it a bit complex and it also needs large storage capacity as proposed in [13].
- As mentioned in the [14] device Ambient Multi-Perspective System for Residential Health Monitoring – The main idea of developing a system was to approach patients after operations and how they would distribute the extra hospital fee. The device contains the following documents A HIS experimental platform that transmits patient data from an internet connected sensor network via a PC. To exchange emails, SMTP is used. In addition to these three sensor types, physiological parameters, environmental parameters and patient activity are used. CAN is used to build the home network. In addition to this more complex code, software like java is also used in the fundamental background of java. This device is also used for automatic restarting agent and oximeter software agent. This system, in general, is efficient and meets the objective of the public.
- A wireless system for monitoring health contains cardiovascular [18] pulse/heart rate, blood pressure, respiration rate and body temperature, and optical amps are used to ensure the conversion is read properly and adc is available. The oximeter

in this device is cut to the finger to obtain heart rate data.

- This paper[19] highlights the wireless sensing devices that integrate the wireless communication with civil structure sensors. The progress of wireless sensor units is described.
- The device [20] is another The method in which the light incidents on the surface and the contents of the surface are analysed with the aid of the attenuation is near infraround spectroscopy. The haemoglobin values are calculated based on the area oxidised and the area deoxidized using light incidents. Also, NIR window frame is used to monitor muscle metabolism in order to prevent any type of interference due to water or other. A well-researched frame work of the device established is formed in order to make the system more readable by providing the calculation of blood cells with the use of Modified Beer Lambert's Law (MBLL).
- This device described in [21] monitors key parameters and drop detection, together with inclination monitoring, to monitor patients' bedding cases in order to resolve the inconveniences of various studied devices. All parameters are covered, from EECG to GSM/GPRS modem, which are interfaced with the main control unit to alter the caregiver in an emergency and prevent fatal conditions.

IV. Property System and Setup Experimental

Its main objective is to develop and implement an intelligent patient control system in hospitals. An overview of the system is shown in Figure 1. Sensors that record heartbeat and temperature with the body. The room's humidity and temperature are measured by two other sensors inside the patient's home. With a control unit, all four sensor values are computed. Then they are transmitted to the base station through the Things Cloud Internet. The clinician therefore has remote access to these values. Based on the temperature values, the heartbeat and room sensor values, your doctor can determine the patient's condition. An e-mail is sent to the patient.



V. CONCLUSION

Health monitoring system, according to the study, has proven to be a highly effective tool for monitoring health status. As a result, it's easier to keep track of one's own health. When easy-to-use equipment is available that can protect a patient's health, it helps to minimize the amount of time it takes to provide it and report this information to interested parties. As a result of this, the device must be able to move and be agile in a human's body, while also being very peculiar in terms of the monitoring of all the parameters set. Futuristic frameworks for this include a combined device that takes up less space and can be used outdoors without affecting results.

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