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Patient Health Monitoring System Using IoT

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Abstract - This paper proposed an answer and method to observe the patient health. This system introduced health-related sensors to observe the patient's health, we can easily provide real-time information available or user and can send them to alert in critical condition over the internet. Patients need proper time and proper help, so first we need to check the continuous patient health system. The fixed monitoring system is been used only when a patient is lying on a bed, this system developed for home use only, when the patient is not in critical condition but needs to be time monitored by a doctor or user member. In that critical condition, the details are sent to the doctor or user member. So that we can make easily and save many lives by providing them this service.

***Key Words*:** Internet of Things, Node McU, OLED, wifi module ESP8266, Patient Health Monitoring sensors.

1. INTRODUCTION

IoT can be defined as the wireless network which is connected to share information and use to interact and produce new information to record and analyze it. The user enables to improve health-related risks and reduce healthcare costs by collecting, recording, analyzing, and sharing large data streams in real-time and efficiently. The design of an IoT-based health monitoring system for emergency medical services and household patients.

The proposed outcome of the project is to give proper medical services to patients by connecting and collecting data information through a health monitoring system which would include patient's heart rate, blood pressure, and Body temperature, and send an emergency alert to the patient's doctor with his current status and full medical information. The idea of this project came so to reduce the headache of a patient to visit the doctor every time he needs to check his blood pressure, heartbeat rate, temperature, etc.

2. LITERATURE SURVEY:

"An Embedded, GSM-based, Multiparameter, Real-time Patient Monitoring System and Control –An Implementation for ICU Patients".

Implementation is a system in which reliable and efficient time using remote patient monitoring system that can help in providing better patient care to develop. This system enables expert doctors to monitor vital parameters body temperature, blood pressure, and heart rate of patients in remote areas of the hospital as well as can monitor the patient when he gets to recover from the hospital. The system provides feedback to control the dosage of medicine to the patient as per the doctor prescribed and giving the response to the health and condition SMS received by the doctor. Mobile phones are used to measure the parameters through SMS to clinical analysis or diagnostics. The time is used to monitor the parameter for the doctor to control the action taken by him. He gives the higher priority which is in need and which develop a unique system.

"IoT based Smart HealthCare Kit":

The system is to provide the better and most efficient health services to the patients by implementing network information so that the experts and doctors could make use of this data and provide a fast and efficient solution. The final model shall be well equipped with the latest features where the doctor can examine the patient from anywhere and anytime. Emergency mail or Sms used to send the data to the doctor with the patient's current status and full medical information can also be worked on. The proposed model can also be deployed as a mobile app so that the model becomes more safety and easy to use anywhere across the globe.

3. PROPOSED METHODOLOGY

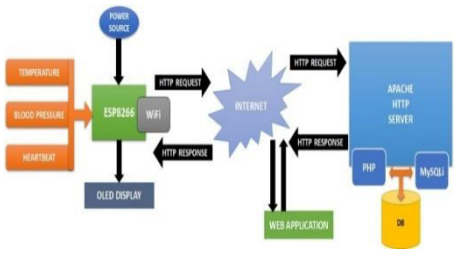

Fig 1. Block diagram of a patient health monitoring system

In this project, we are implementing a patient health monitoring system arranged in the number of sensors, the main purpose of the project to observe all health parameters and alert to patient's doctor with his current status and full medical information. The idea of this project came so to reduce the headache of the patient to visit the doctor every time he needs to check his blood pressure, heartbeat rate, temperature, etc. The hardware contains a temperature sensor, heartbeat sensor, blood pressure sensor, Node MCU, OLED, wi-fi module (ESP8266).

1.1 NODE MCU

All the calculated data by Node MCU which is Proposed to wifi module which is stored on an IoT (Internet of Things) server. Using IoT to Node MCU (Node Micro Controller) is an open-source software and hardware development environment that is built around a very inexpensive System-on-a-chip (SoC) called the ESP8266.

1.2 OLED Display

OLED (Organic Light Emitting Diode)

1.3 Wi-Fi MODULE (ESP8266)

The ESP8266 module is a low-cost wifi microchip, this small module allows the microcontroller to connect to a wifi network. The ESP8266 wifi module is a self-contained SOC with an integrated TCP/IP protocol stack that can give any microcontroller access to your wifi network.

1.4 SENSORS

1.Blood Pressure Sensor:

The pressure sensor is pressed directly against the skin to measure the pressure pulse wave and calculate the blood pressure.

2.Temperature Sensor:

A temperature sensor is an electronic device that measures the temperature of the body and converts input data into electronic data to record monitor or single temperature changes.

3.Heartbeat Sensor:

The heart rate pulses cause a variation in the flow of blood to a different region of the body.

4. SYSTEM IMPLEMENTATION

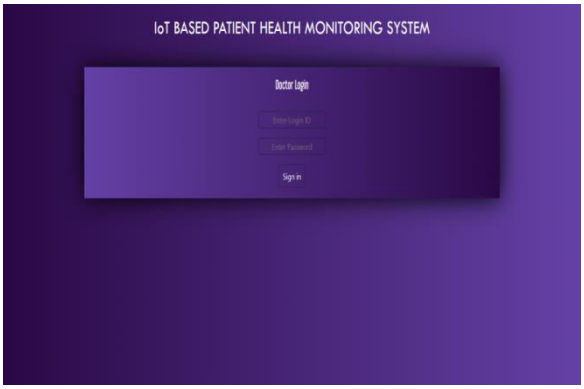

Fig 2. System web portal Login Page

The index or the Home page of the web portal consists of various tabs including the Login, Password, Sign in. In the Login tab, the user can log in to the web portal as a patient or as a doctor as per the credentials given.

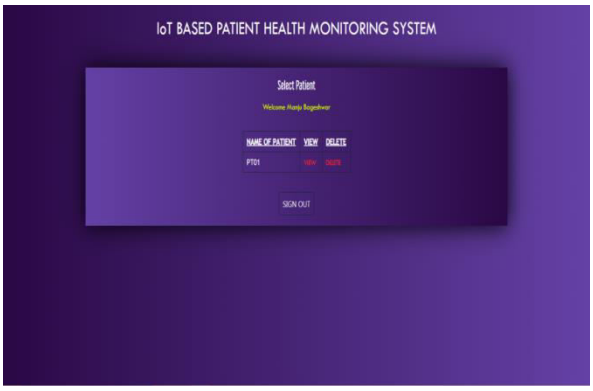

Fig 3. System web portal Admin Page

After sign in there is another web portal that shows patient information like Name of patient, view, Delete. Click on the patient view option it shows particular patient records and measured parameters like Heartbeat, Temperature, Blood Pressure, and also Date and Time of monitoring parameters

Fig 4. System web portal uploading data

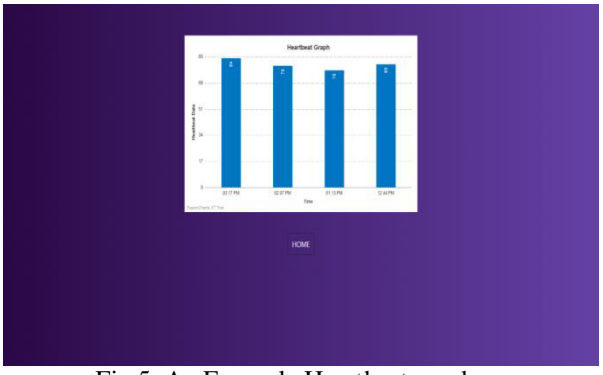

Fig 5. An Example Heartbeat graph

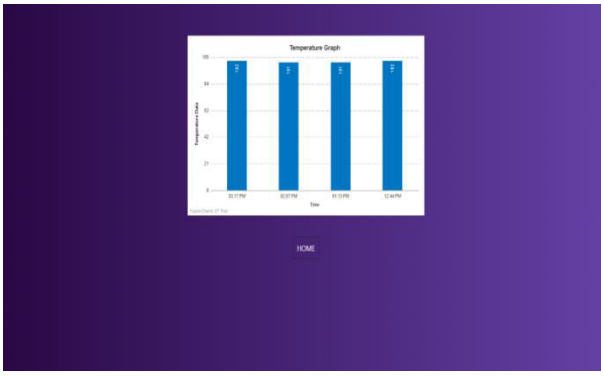

Fig 6. An Example Temperature graph

The data from various sensors are being uploaded into the database server from which the data is further used to plot graphs and analyzed the health reports. The database has full details and records with the history of every patient through which a statistical graph is plotted in real-time which is used for patients' further analysis and tracking. The model is finally deployed over a normal person and his heart rate and temperature details are merged on a real-time graph.

4.1 WORKING

The main objective of this project is to development of an online monitoring and controlling system. In this project I am proposed an IoT-based patient health monitoring system, outcome of the project is to give proper and efficient medical services to patients by connecting and collecting data information through health status. The patient is connected with a health monitoring system that consists of needed health parameters. Then sensors as input data fed to the ESP8266 will be processed the all data and display on the OLED display. Using internet HTTP requests to the server to accept the data. APACHE HTTP server, in this project, consists of a web portal login page, the index or home page of the web portal consists of various tabs including the login, password, sign-in. A user can log in to the web page as a patient or as a doctor. when the user login this page its output is displayed in the mobile application unit. It is a wireless device, the cost of cable is reduced here. It helps continuous monitoring of the vital signs of a patient over long periods. Until an abnormal condition is captured and hence critical situations can be overcome. This intelligent monitoring system provides long-term monitoring capability useful for the staff in the hospitals and reduces their workload. We can use in Intensive Care Units (ICU), Hospital, Home, Old age Home, Ambulances, etc.

5. CONCLUSION

In this system of the Patient health monitoring system can be daily monitored, recorded, and stored as data-based in emergencies. An IoT device can be combined with cloud computing so that the database can share in the hospital for intense care and treatment.

6. ACKNOWLEDGMENT

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