

# Human Health Monitoring System

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**Abstract:** Health has prime importance in our day-to-day life. Sound health is necessary to do the daily work properly. This project aims at developing a system which gives body temperature and heart rate using LM35 and pulse sensor respectively. These sensors are interfaced with controller Arduino uno board. Wireless data transmission done by Arduino through wifi module.ESP8266 is used for wireless data transmission on IoT platform i.e. WebHost. Data visualization is done on WebHost. So that record of data can be stored over period of time .This data stored on web server so that it can be seen to who logged.

**Keywords:** Health monitoring system, controller, pulse sensor, temperature sensor, IOT

## I. INTRODUCTION

Healthcare is given the extreme importance now a- days by each country with the advent of the novel corona virus. Health is always a major concern in every growth the human race is advancing in terms of technology. Like the recent corona virus attack that has ruined the economy of China to an extent is an example how health care has become of major importance. In such areas where the epidemic is spread, it is always a better idea to monitor these patients using remote health monitoring technology. So Internet of Things (IoT) based health monitoring system is the current solution for it.

Internet of Things (IoT) is the new revolution of internet which is the growing research area especially in the health care. With the increase in use of wearable sensors and the smart phones, these remote health care monitoring has evolved in such a pace. IoT monitoring of health helps in preventing the spread of disease as well as to get a proper diagnosis of the state of health, even if the doctor is at far distance. Remote Patient Monitoring arrangement empowers observation of patients outside of customary clinical settings (e.g. at home), which expands access to human services offices at bring down expenses. The core objective of this project is the design and implementation of a smart patient health tracking system that uses sensors to track patient health and uses internet to inform their loved ones in case of any issues.

The objective of developing monitoring systems is to reduce health care costs by reducing physician office visits, hospitalizations, and diagnostic testing procedure. This also comes into account especially when certain epidemic is spread in an area where the reach of doctors is impossible. So to avoid the spread of disease, if a smart sensor is given to patients, who can be monitored from a distance would be a practical solution to save many lives.

## II. MOTIVATION

The reality of modern medicine is that there are many more patients than doctors who are able to help them. The recent pandemic has proven that the world isn't ready for emergencies of that sort and that there is a global need for qualified doctors. The technology can support the medical staff available and lighten the burden. As for health monitoring, there are two main ways that technology can make doctors more efficient:

1. With Human monitoring system, there is no need to process a large amount of data manually and the doctors can save time and effort.
2. The health monitoring software may also free up more beds in hospitals that can be occupied by patients who need urgent help. After analyzing health indicators with the help of IOT, the system may suggest that a certain patient can be discharged and recover at home while receiving medical advice remotely. This allows doctors to focus on people whose lives are in danger. Also, the human monitoring system can help patients recover after surgery or heart attacks while staying at home and in touch with a doctor.

5 reasons to build a Human Monitoring System are:

1. Real-time health monitoring system using IoT can help doctors prioritize patients, and provide urgent care to those who are in the most danger thereby saving lives.
2. More competent patient management can help utilize the resources of the hospital more wisely and save money.
3. It is easy to use the system for patients and medical professionals.
4. The remote health monitoring system is especially useful to monitor patients with chronic diseases. Most chronic diseases are incurable, so it is necessary to monitor the state of the patient while at home, and quickly respond if health indicators worsen
5. The health monitoring system is convenient and portable so it is very convenient for doctors to manage patients and it is also very easy for patients to monitor their own health while staying at home.

In rural hospitals, the facilities for health caring are limited. The poor quality of health management enables issues in health care system Everyone should get the knowledge of own health as easy and early as possible. Also it should be worth for each .Latest report of The India Spend analysis of data says that the 500,000 doctors shortage in India. WHO defines the doctor patient ratio will be 1:1000 which has been failed in India. In developing countries there is lack of resources and management to reach out the problems of individuals. A common man cannot afford the expensive and daily check up for his health. For this purpose various systems which give easy and assured caring unit has been developed. Theses system reduces time with safely handled equipment.

### III. HARDWARE IMPLIMENTATION AND WORKING

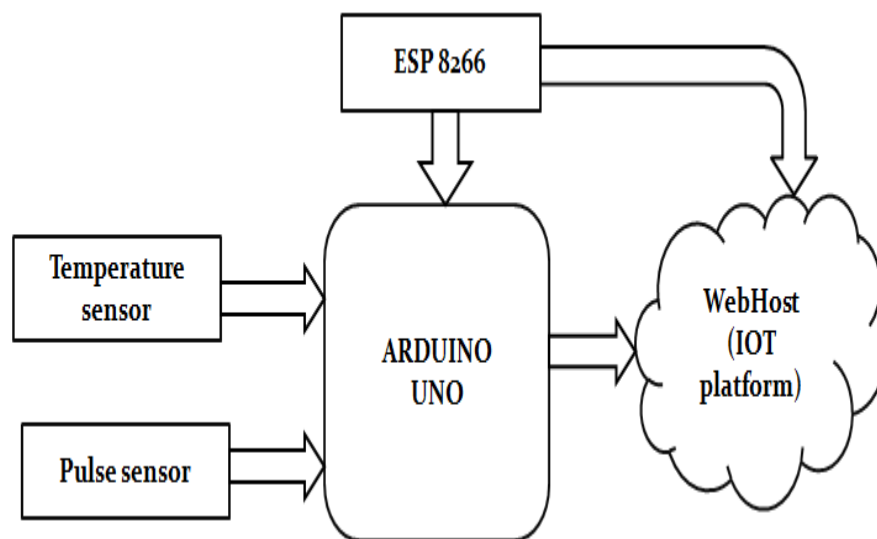


Fig. 1 Block Diagram

The system can be distinguished into three parts, mainly:

1. **Sensor Module:** The sensors are wired which are used to collect data from the patient's body and the environment by gathering physiological signs. The sensors LM35 for temperature and a pulse sensor is used. The collected data is then processed via an ESP8266 and processed to gateway servers.
2. **Data Processing Module:** The arduino uno and the wi-fi module(ESP8266) are the parts used in this area. The arduino uno converts the data into desired format and via the wi-fi module it is sent to Iot platform.
3. **WEB User Interface:** For the web user interface, Web host is used for the graphical interpretation, and display of collected results. It shows the current status and process of transactions. The HTTP protocol provides easy connectivity for the correspondence between a Wi-Fi module and the web server.

#### IV. COMPONENTS USED

1. **ARDUINO UNO** : Arduino uno is microcontroller based on ATmega 328. Simulation is done on Arduino IDE software. The ATmega 16U2 provides serial data to the main processor and has a built-in USB peripheral. Arduino Uno power cable Standard A-B USB cable. It has 14 digital I/O pins.
2. **TEMPERATURE SENSOR** : LM35 sensor is used for measurement of body temperature. Sensor is put in contact with body and it senses body temperature. It is calibrated linearly in Celsius. It has low self heating capability. Also it doesn't require external calibration.
3. **PULSE SENSOR** : Pulse sensor is designed to give analog output of heart beat when a finger is placed on sensor. It starts working; LED on top side will start blinking with each heart beat. To see the sensor output, output pin of sensor is connected to controller. The working principle of sensor is based on light modulation by blood flow through nerves at each heart pulse.
4. **WIFI MODULE** : The ESP8266 wifi module is a self contained SOC with incorporated TCP/IP protocol stack that can offer any controller access to wifi network. It uses 802.11 b/g/n protocols. Standby power consumption is less than 0.1mW.
5. **IOT PLATFORM** :
  - a) Use the WebHost platform to send data to the cloud from any Internet-enabled device.
  - b) You can then configure actions and alerts based on your real-time data and unlock the value of your data through visual tools.
  - c) Use the WebHost offers a platform for developers that enable them to easily capture sensors data.

#### V. APPLICATIONS

- The system is super fine in rural areas as there would be no need for the patients to get their continuous follow-up.
- Used to transfer the information from the transmitter side to the receiver side wirelessly.
- User friendly and bridges gap between doctor and patients.
- Applicable in every hospitals.
- Intensive care can be possible.
- It can be also used in old age homes to monitor the various parameters of a sick person in old age homes.

#### VI. CONCLUSION

The system introduced smart healthcare to monitor the basic important signs of patients like heart rate and body temperature. The rate of success between the observed data and actual data is approximately greater than 95% for all cases of the developed healthcare system. Authentic medical staff can view and track the data in real-time even though the patients perform the tests outside of the hospital. The system can also benefit nurses and doctors in situations of epidemics or crises as raw medical data can be analyzed in a short time. The developed prototype is very simple to design and use. The system is very useful in the case of infectious disease like a novel coronavirus (COVID-19) treatment. The developed system will improve the current healthcare system that may protect lots of lives from death.

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