

# Smart HealthCare Monitoring System Using IOT and Android

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**Abstract :** In today's bus world, it is very difficult for the doctor to manage the time and attend many patient at a time. Sometimes, in case of emergency patient can't wait for appointment or sometimes doctor's need to retrieve patient's info so we are proposing the system which uses IOT and automatically monitor the patients health parameter such as temperature, ECG pulses, blood pressure, heartbeat and also it will keep doctor updated at anytime. Doctor can see the status of any patient and it will alert doctor in case of emergency. The system will reduce dehectic paper work which is observed during physical appointment.

**IndexTerms - HealthCare, Temprature, ECG, Heartbeat, BP, Realtime Database, Android Application.**

## INTRODUCTION

In rural area most of the peoples does not gets appropriate approach to health monitoring and clinics. So it is necessary to design the effective health monitoring system. A tiny wireless device is a resolution bound with IOT can form a conceivable way to regulate patients distantly rather than dating the actual clinic. The unusual tiny transducers are transplant into the human to aggregate the details through which system get human fitness data security and for analysis for treatment. The collected data is then send to remote station via divergent communication technologies like Wi-Fi network with Internet. Health is one of the global issues for mankind. According to the Constitution of the World Health Organization (WHO), the biggest achievable health standards are the fundamental rights of individuals.

A modernized medical system must provide better medical services anytime, anywhere, in a more economical and a user friendly form. In traditional approaches, health care workers play a major role. They need to visit the patient for the essential diagnosis and advices. There are two basic problems related in this approach. Initially, medical staff must always be near to the patient all the time and secondly patients are connected to bedside biomedical equipment for a certain duration of time while they are hospitalized. In order to solve these two problems, various patient-oriented techniques had been proposed. By applying the recompenses of modern bio instrumentation, computers, and telecommunications technologies, modern patient monitoring system (PMS) require to record, display, and transmit physiological data from patient's body at any time.

## RELEVANCE

A health system, also sometimes referred to as health care system or as healthcare system, is the organization of people, institutions, and resources that deliver health care services to meet the health needs of target populations. There is a wide variety of health systems around the World, with as many histories and organizational structures as there are nations. Implicitly, Nations must design and develop health systems in accordance with their needs and resources, Although common elements in virtually all health systems are primary healthcare and public Health measures.

## REVIEW OF LITERATURE

India's poor tribal people have far worse health indicators than the general population. Because of drinking contaminated water, the tribal's face health problems, such as the prevalence of disease, like malaria, cholera, tuberculosis, diarrhea and jaundice, problems associated with malnutrition like iron deficiency and anemia, low levels of life expectancy, etc. This basically results in the low health status of rural areas in India. This paper mainly deals with the ways in which the biomedical system can be monitored using IOT. It mainly works as a connectivity as a method of E-Health Care. The system can also reduce the stress of a rural people to reach for a medical care and doctor. It works on to check the purity of water by applying a sensor. This can result in the source of easy availability of a medical facility. **KEYWORDS:** Internet of Things (IOT), Temperature sensor, Heart bit Sensor, ECG Sensor module, WIFI module[1].

In the latest technology, NFC (Near Field Communication) is a recently growing technology for communication for short range which is aimed to augment existing near field technologies such as RFID (Radio Frequency Identification). In this paper, we have to propose a system which describes how an android application is used as our own NFC tag writer to write patient unique id in NFC tag. Doctors using NFC enabled smart phones to retrieve patient information when placed near NFC tag. This proposed system uses an android smart phone which automatically monitors the patients status and keeps the doctor/nurse updated and maintained through logs that are stored on a cloud server and also alerts are generated through /Email in case of emergency/detection of death of any patient. This system helps in reducing the paper work required during the registration of the patient and also eliminates the disadvantages of using RFID based system. **Keywords:** NFC tags, web server, NFC enabled smart phone, Android application.[2].

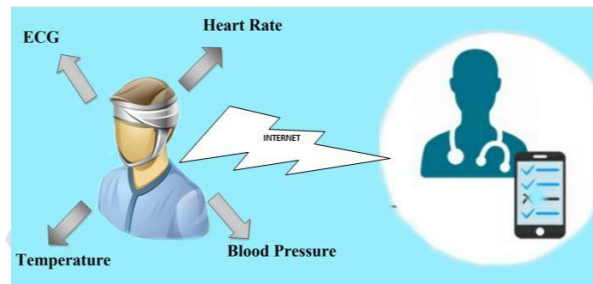
In the recent development of, Internet of things (IOT) makes all objects interconnected and it has been recognized as the technical revolution. One of the application is in health care to monitor the patient health status internet of things makes medical equipments more efficient by allowing real time monitoring of patient health, In which acquire data of patient's and reduce the human errors. In internet of things patient's parameters get transmitted through medical devices via a gateway, where it is stored and analyzed. The significant challenges in the implementation of internet of things for healthcare applications are monitoring all patients from various places. Thus internet of things in the medical field brings out the solutions for effective patient monitoring at reduced cost and also reduces the trade-off between patient outcome and disease management. In this paper discuss about, monitoring

patient's body temperature and heart beat using arduino board. Index Terms:- IOT, Arduino Board, Sensors, Bluetooth, Patients, health care.[3].

In the recent years wireless technology has increasing for the need of upholding various sectors .In these recent years IoT graped the most of industrial area specially automation and control. Biomedical is one of recent trend to provide better health care. Not only in hospitals but also the personal health caring facilities are opened by the IoT technology. So having a smart system various parameters are observed that consumes power, cost and increase efficiency .In according to this smart system , this paper is reviewed. In traditional method, doctors play an important role in health check up. For this process requires a lot of time for registration, appointment and then check up. Also reports are generated later. Due to this lengthy process working people tend to ignore the checkups or postpone it. This modern approach reduces time consumption in the process.[4].

### PROPOSED SYSTEM

Here proposed system is designed to reduce the difficulties of rural people. It merges the idea of an active E-Health Care System. The system mainly reduces the human effort by connecting to people from distant places. The sensors play a major role in this human health care facility. Temperature sensors (LM-335) are used to measure the body temperature of a patient., a heartbeat sensor is used to measure the pulse of the human body. Also, a ECG sensor module (AD-8232) is interfaced, it is used to measure the rhythm of heart and blood flow through it. These sensors are together interfaced with ATMEGA328 Microcontroller. Then, a server and web page part is introduced with respect to IOT which acts as a link between the patient and doctor.



### WORKING OF PROJECT

The sensing devices from the patient are connected to the Microcontroller System which is programmed to convert the sensed data from the patient to readable signals and then transfer the signal wirelessly to IOT or the doctor's checking.

#### **Heart rate sensor :**

In this project technique of measuring the heart rate through a fingertip. While the heart is beating, it is actually pumping blood throughout the body, and that makes the blood volume inside the finger.

#### **Temperature sensor :**

The LM335 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in Celsius).

#### **ECG Sensor Module :**

This electrical activity can be charted as an ECG or Electrocardiogram and output as an analogy reading. Ecgs can be extremely noisy, the AD8232 Single Lead Heart Rate Monitor acts as an op amp to help obtain a clear signal from the PR and QT Intervals easily.

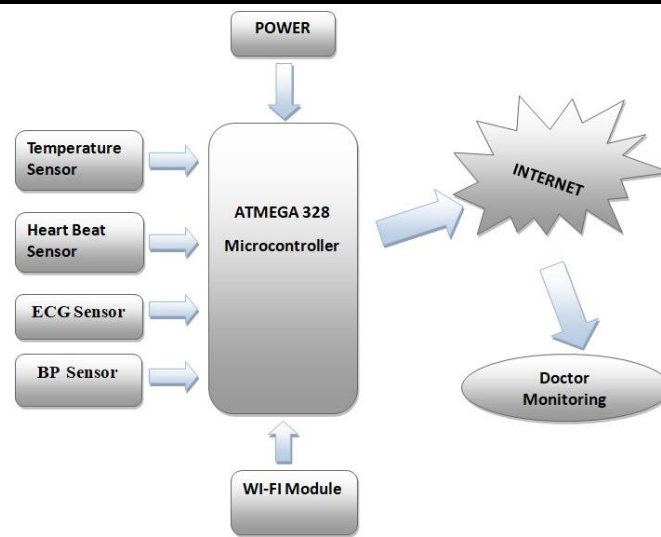
#### **Blood Pressure sensor :**

The Blood Pressure Sensor is a non-invasive sensor designed to measure human blood pressure. It measures systolic, diastolic and mean arterial pressure utilizing the oscillometric technique. Pulse rate is also reported.

The data transmission components on the system are responsible for conveying records of the patient from the patient's house (or any remote location) to the data centre of the hospital with assured security and privacy, ideally in real-time. The information hubs that collect sensor data and analyze it and then communicate it to the IP address, which is created to send the details about the patient condition to doctor. Gateways can be designed for the clinic to transfer the data. Medical device designers can also use this platform to create remote-access devices for remote monitoring.

### SYSTEM ARCHITECTURE

In this project ATMEGA328 microcontroller is use as a main controller. The power supply circuit is used to provide 5V DC to the microcontroller and other components from 230v AC source. The sensors like temperature sensor, heart beat sensor, ECG sensor and BP sensor are connected to the microcontroller. The outputs of these sensors are either analog or digital in nature but it doesn't need any interfacing circuit or IC to connect with microcontroller. Hence these sensors are directly connected to the microcontroller. The Wi-Fi module is connected to the microcontroller to upload all the patient health parameter over internet. All the data are uploaded on server database(Firebase) to store all the data. Continuously these data are sending to doctor's mobile. Android app has facility to continuous monitoring the data and it is accessible by only authorized persons. The data from temperature, ECG, BP and respiration sensor is updated automatically on android app.



## CONCLUSION

The important parameters of the patient body such as temperature, ECG, Blood Pressure and Heart rate are checked by the respective sensors. The measured parameters are transmitted to the cloud through the Wi-Fi module. Finally we can see the analysis of patient body parameter on mobile phone user as well as laptop user through browser. Only authorized person(Doctor) has access to this data.

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