Intelligent health monitoring system using NRF

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Abstract - *ICU stands for Intensive Care Unit, a place in the hospital where very ill patients are monitored very closely. Typically, the patient-staff ratio is very low and the LIFE-SAVING EQUIPMENT used is very advanced. Generally ICU is a hospital facility for provision of intensive nursing and medical care of critically ill patients, characterized by high quality and quantity of continuous nursing and medical supervision and by use of sophisticated monitoring and resuscitative equipment .The patients in the ICU need a constant monitoring of their Temperature and heart beat. This project is a working model, which incorporates sensors to measure important parameters namely the Temperature, Respiratory temperature and Heart Beat.*

*Key Words***:** NRF, GSM, Heartbeat sensor, Temperature sensor, Arduino-nano

1. INTRODUCTION

The reason for a patient staying within the hospital isn't that he or she really desires active treatment. Often, the principal reason for a prolonged keep within the hospital is continual observation. In today's world, the utmost use of resource is usually complimented. So, the utilization of wireless technology is increased to fulfill the requirement of device observance. Remote Patient observance (RPM) could be a technology that helps North American nation to observe patient once the patient isn't within the clinic or hospital. It's going to increase access to health services and facilities whereas decreasing price. Heartbeat and blood heat are the key signs that are habitually measured by physicians when the arrival of the patient.[1]

Like pulse, traditional temperature additionally varies from person to person and changes throughout the day. The body temperature is lowest within the early morning and highest within the early evening. the traditional temperature is regarding 37° C or ninety eight.6 ° F. However, it may be as low as 36.1° C (97°F) within the early morning and as high as thirty seven.2⁰ C (99° F) and still be thought of traditional. Thus, the

normal range for temperature is ninety seven to a hundred degrees physicist or 36.1 to 37.8 degrees stargazer. Temperature may be measured by victimisation differing kinds of sensors. These sensors are available in totally different forms like thermocouples, thermistors, resistance temperature detectors (RTD), and integrated circuit (IC) sensors.[2]

This has wiring complexities .Such systems produce difficult wherever the gap amongst System and computer is a lot of. The accessible systems are stupendous in size. General watching of a patient isn't doable once he/she is discharged from hospitals .These systems can't be utilised at singular level .Consequently to get rid of human mistakes and to diminish excessive burden of continually checking patient's health from doctors head, we tend to are proposing health checking framework utilizing GSM.[3] The goal of health watching system is to possess quantitative analysis of essential Physiological factors of patients amid crucial conditions. Pulse rate refers to what percentage times a heart contracts and relaxes during a minute. Pulse rate varies for various age teams. For a person's adult old eighteen r additional years, a traditional resting pulse rate is around seventy two beats per minute (BPM). The functioning of heart is referred to as economical if it's having lower pulse rate once the patient is at rest. Babies have a far higher rate than adults around 120bpm and older youngsters have pulse rate around 90bpm.[4]

1.1 Existed system

Already we have an existing system in hospitals and it is heavy equipment. The cost of this system is high. The quantity of the system in hospitals available is very less in quantity.[4]

Fig.1 existed system

1.2 Proposed system

We are proposing a modified system consists of sensors and here we are using the mesh technology for patient monitoring. In this system we are taking the sensors like hear-beat and temperature measuring for the systems. We are having a complete and continuous monitoring of the patients in hospitals.
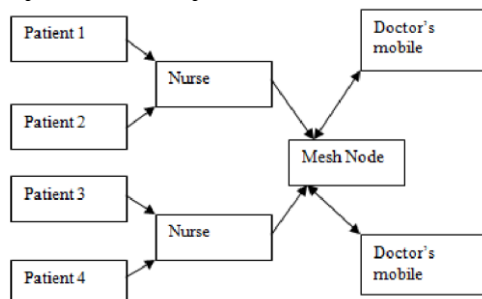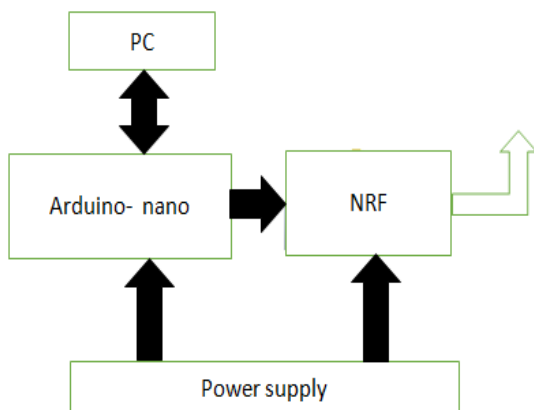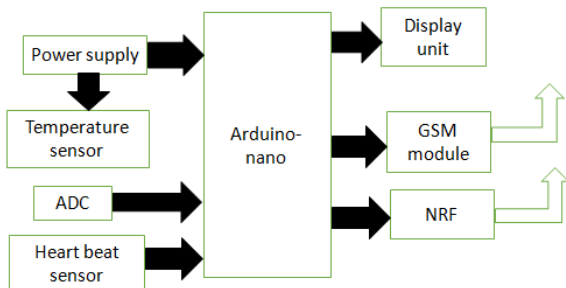

Fig.2 proposed system

2. Block diagram

Fig: Heart beat sensor

Fig: temperature sensor

Table -1: average heart rate

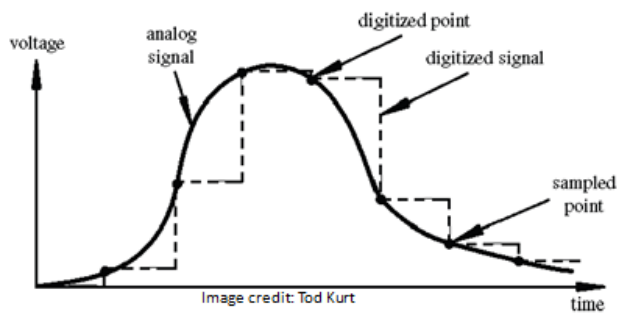| Age	Average heart rate
New born	140
7 years	85-90
14 years	80-85
Adults	70-80

Chart -1: Arduino analog output

Arduino-Nano is a small, complete, and breadboard friendly board based on the ATmega328P.It comes with exactly the same functionality as in Arduino-uno but quite in small size. It comes with an operating voltage of 5V, however, the input voltage can vary from 7 to 12V.Arduino-Nano Pin-out contains 14 digital pins, 8 analog Pins, 2 Reset Pins & 6 Power Pins. Each of these Digital & Analog Pins assigned with multiple functions but their main function is to be configured as input or output. They are acted as input pins when they are interfaced with sensors, but if you are driving some load then use them as output. Functions like pin-Mode () and digital-Write() are used to control the operations of digital pins while analog-Read() is used to control analog pins.

3. CONCLUSION

 We have analyzed the wireless patient monitoring system of temperature and heartbeat for humans using NRF24l01. The heart beat was measured with the help of photodiode and bright LED while the temperature was measured by using precision integrated temperature sensor LM35. Both the data were processed in the arduino-uno and sent to the remote end wirelessly by using NRF transmitter and received at the remote end by using NRF receiver.

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