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PATIENT'S HEALTHCARE MONITORING SYSTEM IN AMBULANCE USING IOT

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Abstract: In the Development of technology and ever ready of internet makes the world smaller.IOT is a new developing technology which encompasses mechanics such as smart home, smart farming, industrial internet, connected health etc., One of the IOT application in healthcare is to monitor the patient's health condition continuously using sensors. With the help of IOT, the monitored values are updated in webpage where it is stored and analyzed. The noticeable challenge in the execution of Internet of things for healthcare application is monitoring the patient's health status from various places. In this paper explains about monitoring patient's Heartbeat, Blood pressure and body Temperature using Raspberry Pi kit. This proposed system is very efficient with enhanced patient experience, reduced errors, improved disease management and decreased costs. It will be useful for rescue people from an abnormal condition.

Keywords: Heartbeat sensor, Temperature sensor, Blood pressure sensor, Raspberry pi, Internet of things, Analog to digital converter.

I. INTRODUCTION

The growth of "Internet of Things" is changing the world tremendously in recent years.IOT in this project helps enormously to save the patient's life and make the operation easier. The applications of IOT can be grouped into many like Transport and logistics, Healthcare, Smart Environment, Personal and social. The strength of IOT has high impact on everyday's life. The role of various domains is remarkably high in all the above fields. In this Project sensor are used to monitor the patient health condition. The sensors are Heartbeat sensor, Blood Pressure Sensor, Temperature Sensor.

The major part of this system is Raspberry Pi which acts as a mini-computer in this project. It is designed for the Linux Operating system and the main advantage of using Raspberry Pi is at very low cost and small in size. It allows to interfacing with the sensors with the General Purpose Input Output Pins. The Working of the Raspberry Pi is to collect the data from the sensors (heartbeat, temperature, blood pressure) to transfer wirelessly through the Internet of Things website.

II. PROPOSED SYSTEM

This System uses an ADC as a key to interface to the sensors such as blood Pressure sensor, heartbeat sensor and temperature sensor .The ADC function is to convert the analog input to the digital output. The digital output of the ADC passes to the Raspberry Pi General Input Output Pins (GPIO pins).The values from the sensors will be automatically updated in the monitoring screen for every second. This can be used for communicating with the nearby hospitals.

A. *Abbreviations and Acronyms*

GPIO –General Purpose Input Output
ADC-Analog to Digital Converter
LAN-Local Area Network
USB-Universal Serial Bus
UART-Universal Asynchronous Receiver Transmitter
SDIO-Serial Data Input Output

III. METHODOLOGY

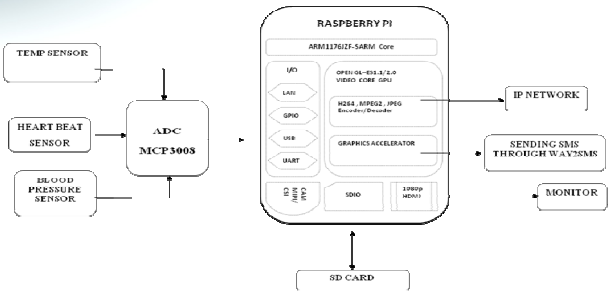

Fig. 1. Block Diagram of Patient Healthcare monitoring syste

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A.LM35 TEMPERATURE SENSOR:

The LM35 is an accurate integrated circuit used to measure temperature in volts which is proportional to the Celsius temperature. It can be measured with more precision than the thermistor.It is low cost and low output impedance.LM35 operates from 0 to 30volts and draws only 60uA from supply. It operates over - 55 to +150˚C temperature range

B.HEARTBEAT SENSOR:

The heartbeat pulse sensor consists of LED (Light emitting Diode) and Photo Diode. It gives digital output when a finger is placed between Photo Diode and LED heartbeat sensor. The digital sensor is connected to raspberry pi to measure the BPM (Beats per Minute).It causes a variation in the flow of blood to different regions of the body. When a tissue is placed, the light is illuminated which is emitted by LED. The light is absorbed by the blood and transmitted light is received by the light detector. The absorbed light depends on the blood volume in the tissue. The digital output of the sensor is given to the Raspberry pi.

C.BLOODPRESSURE SENSOR:

The blood pressure sensor is a apparatus used to measures the blood pressure in arteries and it pumps the blood in everypart of the body.Our heartbeats contracts and pushes blood to the body, it creates force that is pressure on arteries.The blood pressure is recorded and the output is given to the raspberry pi where the data can be stored and can be retrieved later.

D.RASPBERRY PI:

The Raspberry Pi is a small single board computer that connected to a system monitor to display the digital output .The Raspberry Pi 3 model B has a 1.2GHz 64-bit ARMv8 processor with 1GBRAM.The ADC and the sensors are interfaced to the Raspberry Pi in which it is connected to a monitor screen of a computer. The digital output values will be automatically updated in a screen continuously for every second.

IV. EXPERIMENTAL SETUP

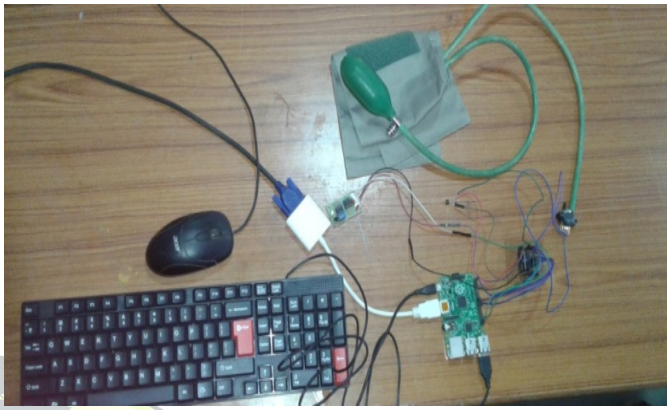

Fig 2. experimental setup

The three sensors are connected with the ADC in which the analog input values of temperature, blood Pressure and heartbeat are been converted into digital output values. The ADC (Analog to Digital Converter) is been interfaced with the Raspberry Pi.The converted digital output values are been passed into Raspberry Pi in which the values are been automatically updated in the monitoring screen for every seconds. The values shown in the monitoring screen is been sent to a nearby hospitals through SMS or a Mail Alert using IOT. Here LED is used for communicating purposes in order to know whether there is an availability or not which is been used in our project to save the precious time of a patient's life.

V. RESULTS AND DISCUSSION

The conventional output is Raspberry Pi collects and stores the data through the sensors attached. The monitored data is transferred to the hospital through SMS or Mail Alert using IOT. The information provided to the hospital will help to make pre-arrangements according to the patient's health status in which the Patient's life can be saved.

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Fig 3. program of the project

VI. CONCLUSION

Creative uses of IOT technology in Patient's Healthcare System have enabled the low-cost, small in size, reduce manpower, saving time and communicate in long distances. The live promote data sent through the ambulance to the hospital helps in keeping track of patient's health status and reach the hospital without any time delay. Thus the Patient's Healthcare System effectively uses internet to monitor the patient's health condition and save lives on time.

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