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Health Monitoring (Temp, Spo2, pulse on IOT, Mobile Application)

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Abstract: Nowadays, heart diseases are considered to be the primary reasons for unexpected deaths. Thus, various medical devices have been developed by engineers to diagnose and scrutinize various diseases. Healthcare has become one of the most substantial issues for both individuals and government due to brisk growth in human population and medical expenditure. Many patients suffer from heart problems causing some critical threats to their life, therefore they need continuous monitoring by a traditional monitoring system such as heartbeats which is the most important technique used in measuring the electrical activity of the heart, this technique is available only in the hospital which is very costly and far for remote patients.

The development of wireless technologies enables to build a network of connected devices via the internet. The implementation of the proposed healthcare system enables the doctor to monitor the patient's remotely using IoT Blynk application installed on his smartphone for processing and visualizing the patient's heartbeat signal. The monitoring process can be done at anytime and anywhere without the need for the hospital.

keywords- Health Monitoring, Mobile Application, Internet Of Things.

I. INTRODUCTION

The increased use of mobile technologies and smart devices in the area of health has caused great impact on the world. Health experts are increasingly taking advantage of the benefits these technologies bring, thus generating a significant improvement in health care in clinical settings. Likewise, countless ordinary users are being served from the advantages of the M-Health (Mobile Health) applications and E-Health (health care supported by ICT) to improve, help and assist their health.

According to the constitutions of World Health Organization (WHO) the highest attainable standard of health is a fundamental right for an individual. As we are truly inspired by this, we attempt to propose an innovative system that puts forward a smart patient health tracking system that uses sensors to track patient vital parameters and uses internet to update the doctors so that they can help in case of any issues at the earliest preventing death rates. Patient Health monitoring using IoT is a technology to enable monitoring of patients outside of conventional clinical settings (e.g. in the home), which may increase access to care and decrease healthcare delivery costs. This can significantly improve an individual's quality of life. It allows patients to maintain independence, prevent complications, and minimize personal costs. This system facilitates these goals by delivering care right to the home. In addition, patients and their family members feel comfort knowing that they are being monitored and will be supported if a problem arises.

For this study secondary data has been collected. From the website of KSE the monthly stock prices for the sample firms are obtained from Jan 2010 to Dec 2014. And from the website of SBP the data for the macroeconomic variables are collected for the period of five years. The time series monthly data is collected on stock prices for sample firmsand relative macroeconomic variables for the period of 5 years. The data collection period is ranging from January 2010 to Dec 2014. Monthly prices of KSE - 100 Index is taken from yahoo finance.

II. LITERATURE SURVEY

1.G. Ismaeel and E. K. Jabar. intended to reach mhealth by designing a health care system for pregnant women using Mobile GIS. This system enables the pregnant woman which needs advice, revision and succoring (from their home) to register in maternity care center via the web interface by sending SMS to the system server including her ID, phone number, name, age, as well as locating the position using a mobile built-in GPRS technique.

2.B. M. Lee and J. Ouyang. designed an intelligent service model for healthcare. A collaboration protocol has been proposed to send and receive the factors related to the risks between IoT healthcare devices. The collaboration protocol is an application protocol consisting of many events which are applied to organize the flow of data between IoT's devices, the boot event initializes all the IoT's devices in the system by broadcasting join message.

3.A. Ahamed et al. [14] implemented a low-cost ECG monitoring system. This system consists of four units, an ECG acquisition unit senses the patient's ECG data signal by using the Bio Protech T716 electrode, this data is transferred to the amplifier input. Signal conditioning unit uses the AD620 amplifier as well as many other techniques to get a pure data signal by amplifying the data signal and reducing the noise

4.B. Padmavathi and S. T. Rana. [8] designed and implemented a framework for IoT based healthcare solution based on cloud computing. This framework includes five layers. Data processing layer identifies and locates the data from sensor-based technology by using RFID, ZigBee, NFC, Barcode technologies and digital cameras

III. RESEARCH METHODOLOGY

It is a co-design methodology based system. We are using hardware and software both simultaneously to perform patient health monitoring system.As we have to design IOT system, we need a controller with Wi-Fi connectivity. So we select ESP8266 based NodeMcu. It will connected to sensors and LCD display. Nodemcu will read data from temperature sensor DS18b20 with one wire protocol and upload data to iot cloud. After this controller will read data from another sensors one by one and upload data to iot cloud. On getting all parameter, we can monitor it via mobile application. We will use blynk IOT cloud for monitoring and controlling interface.

These all sensor will connected to the Node MCU controller which will take sensors data and provided it to the LCD interfaced module. Node MCU controller has inbuilt Wi-Fi facility to connect with internet and give access to IOT devices. Blynk application will use to connect mobile or laptop to IOT. This application provide user interface to monitor different parameters from remote distance.

IV. PROPOSED SYSTEM

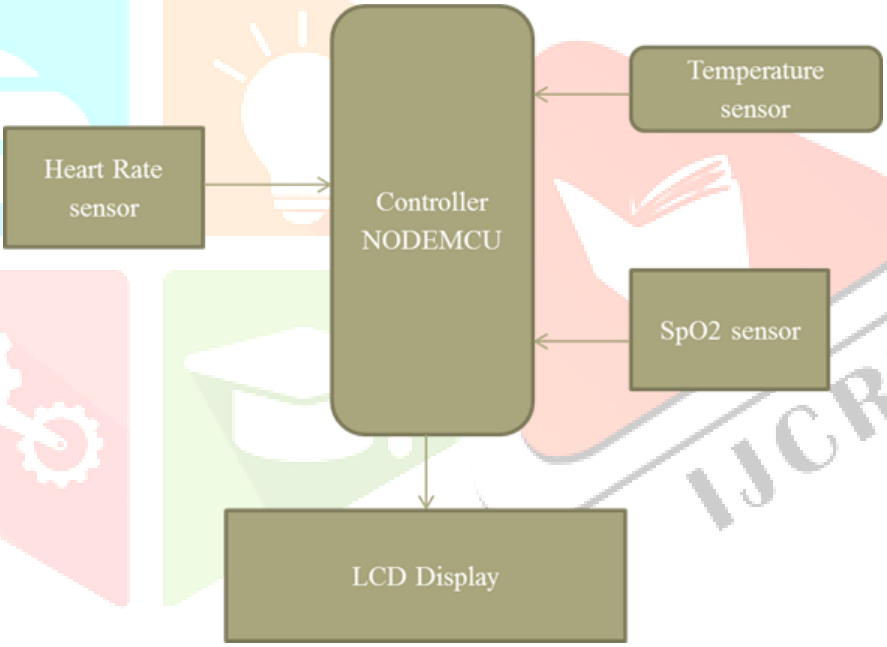

Fig.1.block diagram

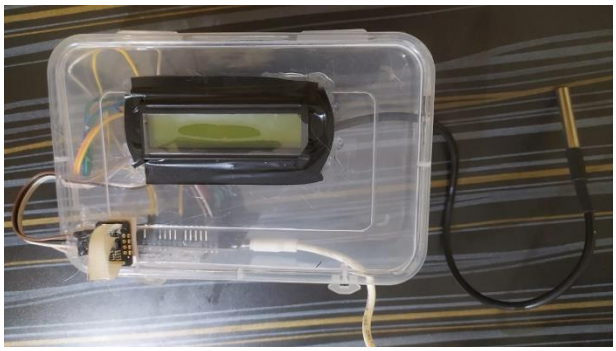

Fig.1.2. Original Circuit diagram

V. CIRCUIT DESCRIPTION

The components used in circuit diagram are NodeMCU controller, heart rate sensor, one wire temperature sensor and LCD display with I2C module. One wire temperature sensor is used to detect temperature of patient. The output of sensor is given to the controller at pin D5 which is a digital pin. As the output of sensor will be in two states hence we are using digital pin D5 to read sensor's output to process further and generate or displayed output at LCD. The heart rate sensor is a commonly used heart beats measurement and SPO2 measurement. This sensor come with I2C module. I2C module has 4pins which are connected to the digital pins of controller. SCL and SDA pins of module are connected at D1 and D2 pins respectively. Rest 2 pins are ground and supply pins which are connected to ground and supply pins of controller. All sensors value will be indicating on LCD display which is connected to the controller via I2C module which convert serial data from controller to parallel data for LCD display. I2C module has 4pins which are connected to the digital pins of controller. SCL and SDA pins of module are connected at D1 and D2 pins respectively. Rest 2 pins are ground and supply pins which are connected to ground and supply pins of controller.

VI. RESULTS AND CONCLUSION

This is an important sensor based project which has the latest technology implemented in it. And it has many applications & advantages.

We have successfully connected heart rate sensor and one wire temperature sensor with NodeMCU controller and also interfaced LCD with controller via I2C module.

The output of sensors is successfully displayed on LCD display as shown in above diagram.

These are the readings of our health monitoring device.

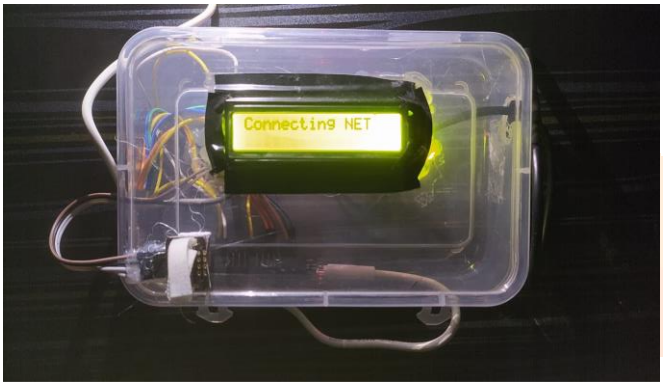

Fig.1.3. Internet Connection

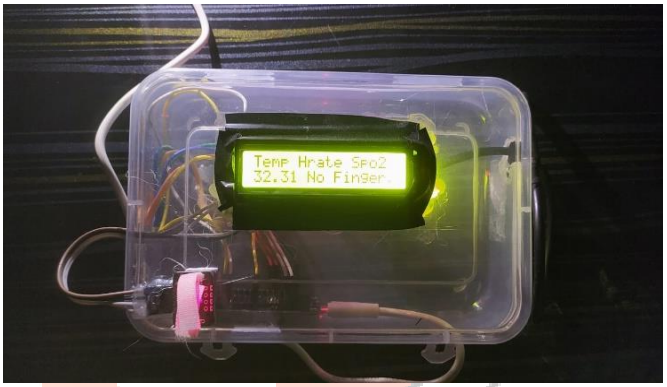

Fig.1.4 Readings Without Finger

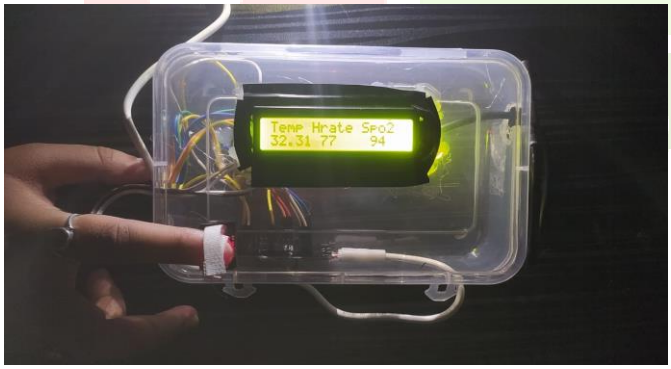

Fig1.5 Readings With Finger

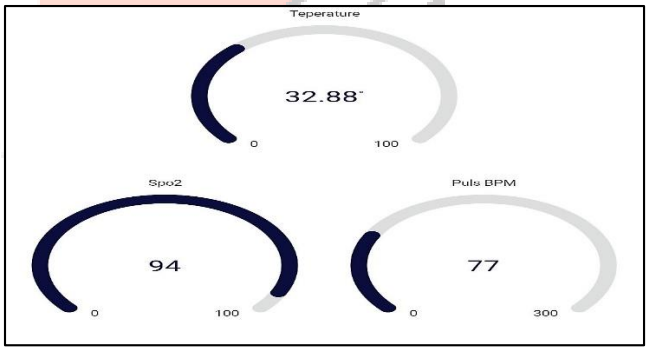

Fig.1.6 Readings on Blynk Application

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