Medication Alerts and Supervisory of Health Using IOT

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Abstract - The health and wellness sector are critical to human society and as such should be one of the first to receive the benefits of upcoming technologies like IoT. Some of the Internet of Medical Things (IoMT) are connected to IoT networks to monitor the day-to-day activities of the patients. Recently there has been attempts to design new medical devices which monitor the medications and help aged people for a better assisted living. In this project, one such attempt is made to design a multipurpose intelligent device named MEDIBOX which helps the patients take their medications at the right time. This box is a proficient system which maintains the parameters like temperature and humidity in a controlled range recommended by the drug manufacturer and thus maintains the potency of the medicines even if the patient is travelling. Related to this, we have developed a web server which is capable of cloud-based installation and monitoring that store and controls the MEDIBOX functionality for further analysis and future modification in design aspects.

Index Terms - Thermoelectric Peltier Cooling, Heartbeat Sensor, Temperature Sensor, Node MCU, Lcd 16x2.

I. INTRODUCTION

If the patient sufferings from the disease where it is compulsory to take medicine at proper time, in this paper we have review the technology of home health care system among them a medicine reminder system and some improvement regarding authentication have well focused. Generally, for home-based health care the arrangement includes communications, imaging, sensing and human computer interaction technologies embattled at diagnosis, treatment and monitoring patients without disturbing the quality of lifestyle. It can be possible the development of a low-cost medical sensing, communication and analytics device that is real-time monitoring internet allowed patients physical conditions. Because of healthcare reforms, digital medical records have facilitated the widespread availability of publicly available, statistical data. Feeding the pool of mounting data is the patient doctor interaction Physicians assess the patient's complaint and prescribe a course of action.

The data collected provides the basis for a decision support tool for patients to compare Prescription Drug Plans based on a patient's individual situation and preferences. The tool will provide explicit information that will assist the patient in determining the most suitable prescription drug plan, considering the individual importance of plan features. Utilizing historic data, comparisons on Prescription spending will be made to past patients who have a similar health profile as identified by the current patient.

II.PROPOSED SYSTEM

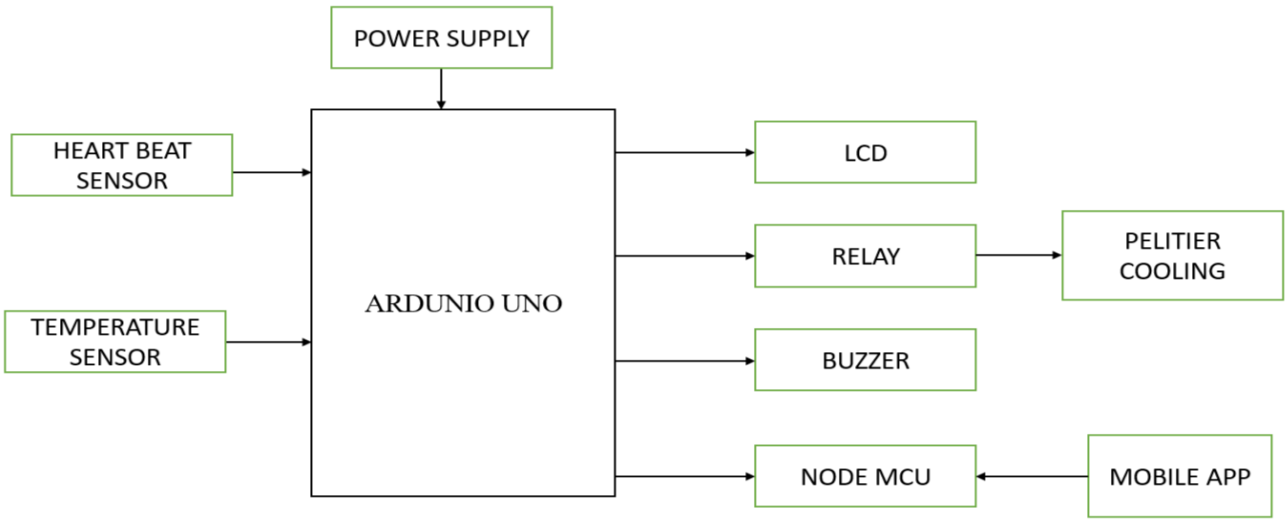

Fig: Block Diagram for proposed System

AURDINO UNO:

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards

PELTIER COOLING:

Thermoelectric cooling uses the Peltier effect to create a heat flux at the junction of two different types of materials. A Peltier cooler, heater, or thermoelectric heat pump is a solid-state active heat pump which transfers heat from one side of the device to the other, with consumption of electrical energy, depending on the direction of the current. Such an instrument is also called a Peltier device, Peltier heat pump, solid state refrigerator, or thermoelectric cooler (TEC) and occasionally a thermoelectric battery.

Relay:

A relay is an electromechanical switch, which perform ON and OFF operations without any human interaction. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. When this relay allows power supply through it solenoid acts as unlock state by that door can be opened otherwise it remains in locked state.

BUZZER:

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarms, timers and confirmation of user input such as a mouse click or keystroke. A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a bee

LCD:

A **liquid-crystal display** (**LCD**) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and seven-segment displays, as in a digital clock.

HEARTBEAT SENSOR:

heartbeat sensor is based on the principle of photoplethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (avascular region). In the case of applications where the heart pulse rate is to be monitored, the timing of the pulses is more important. The flow of blood volume is decided by the rate of heart pulses and since light is absorbed by the blood, the signal pulses are equivalent to the heartbeat pulses.

TEMPERATURE SENSOR:

In this tutorial, we will use pre-wired and waterproof version of the DS18B20 digital temperature sensor. This sensor is handy when you want to measure temperature of the place which is far away, or in wet condition. Because the sensor is digital, we don't get signal degradation over a long distance. This 1-wire digital temperature sensor is fairly precise (i.e. + or – 0.5-degree Celsius).

BLYNK MOBILE APP:

Blynk is a mobile application which was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things. All controlling and monitoring takes place through this application.

POWER SUPPLY:

We have used chloride safe power sealed acid battery. Having 12v,7Ah. These batteries are rechargeable. This is connected to the filter to remove harmonics and in turn given to the regulator that regulated output is supplied to the components.

NODE MCU:

The Node MCU (***N***ode ***M***icro***c***ontroller ***U***nit) is an open-source software and hardware development environment built around an inexpensive System-on-a-Chip (SoC) called the ESP8266. The ESP8266, designed and manufactured by Espressif Systems, contains the crucial elements of a computer: CPU, RAM, networking (WIFI), and even a modern operating system and SDK. That makes it an excellent choice for Internet of Things (IoT) projects of all kinds. However, as a chip, the ESP8266 is also hard to access and use. You must solder wires, with the appropriate analog voltage, to its pins for the simplest tasks such as powering it on or sending a keystroke to the "computer" on the chip. You also have to program it in low-level machine instructions that can be interpreted by the chip hardware. This level of integration is not a problem using the ESP8266 as an embedded controller chip in mass-produced electronics. It is a huge burden for hobbyists, hackers, or students who want to experiment with it in their own IoT projects.

III.MTHODOLOGY

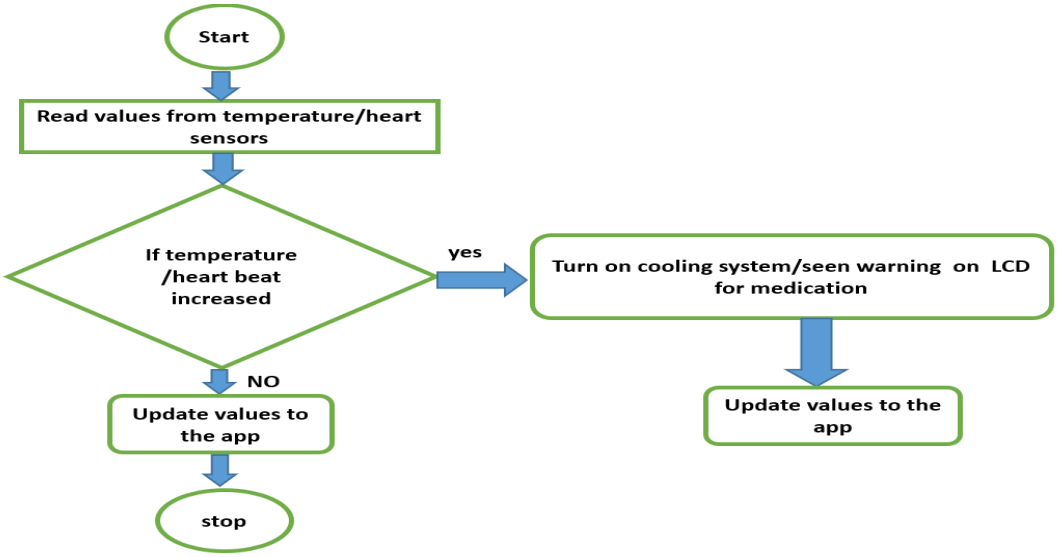

Fig 2: Flow Chart

IV.WORKING

The proposed system works as when switched ON the kit it shows the temperature on the Medi box and make temperature decrease in the Medi box. In this system implemented above 25 degrees as threshold value for turning ON the cooling system below 25 degrees the cooling system will turned OFF. The Thermoelectric Peltier cooling system works as one side cooling part so we attached cooling part to inside the Medi box. Another side heating part is connected to heating dissipation fan for dissolving heating issues in the system. The temperature sensor for ON/OFF operations we use DS18B20 Temperature sensor is commonly used for measuring temperature /humidity inside the box giving accurate values in the box the resultant values are shows in the 16x2 Lcd (Liquid crystal display) is a flat panel display. electronic visual display that uses the light modulating properties of liquid crystals. liquid crystals do not emit light directly.16x2 means that 20 characters can be displayed in each row of the 16x2 LCD.The heartbeat sensor is used for detecting the person's heart rate, this sensor is designed to give digital output heart beat when a finger is placed on it. when the heartbeat detector starts working the light emitting detector (LED) blinks simultaneously for every heartbeat. The output of this Led flash is in digital form.The buzzer is an audio signaling device may be mechanical or electromechanical device. Which is used for altering for taking medicines in time for diagnosing to people. Make sounds for every medication in real time we implement the time as per delaying time to make alerting sounds for medication.The Node MCU (Micro Controller Unit) is an open-source software and hardware development environment built around an inexpensive System-on-a-Chip (SoC) called the ESP8266. The ESP8266, designed and manufactured by Espressif Systems, contains the crucial elements of a computer: CPU, RAM, networking (Wi Fi), and even a modern operating system and SDK (software development kit). That makes it an excellent choice for the Internet of Things (IoT) projects of all kinds. Node MCUIs used connecting all devices with the WIFI it provides access to the GPIO (General Purpose Input/Output) the Node MCU and Aurdino both are connected for protocol (TCP/IP) transferring components.

Bylnk App, Bylnk server, Bylnk Libraries all are aimed for to simplify for mobile and web applications for the Internet of Things. The application should develop as per user wants system. The app is connected through the Node MCU sharing the information through Internet connectivity (WIFI) to control the kit with that information and observing the resultant values.

V.CONCLUSION

In this paper, we have proposed a Medication Alerts and Supervisory of Health Using IOT Technology. The proposed system is designed to serve aged peoples and independently living patients, to notify about the medications that to be taken at different intervals. The temperature sensor monitors the temperature inside the medicine box and Peltier cooling system with heat sink is used to maintain the temperature inside the box. An app is specially designed for this project with which user can monitor the temperature of medicine box and heartbeat of patient and can remind the patient to take medicine on time. For home health care various technology have evolved as review considered, in this paper medicine, its scheduling has well focused which is beneficial to improve efficiency of prescribed drug and reduce economic factor. To improve the existing home health care technique number of monitoring technology has observed which leads to home health monitoring system. The monitoring system can be implemented with sensing element and wireless module which should need to secure so that message containing the health-related information should not be corrupt.

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