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MEDICATION ALERTS AND SUPERVISORY OF HEALTH USING IOT

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Abstract: **- The proposed system helps in measuring body temperature and heart beat through sensors besides reminding the medicines at appropriate time. All these things are carried by the help of Arduino, sensors, GSM module etc. This project renders people by giving timely alerts. The digital world ideas in which distinct sensors and LPU (local processing units) are interconnected for data sharing is implemented in numerous industries during these days. Medical drugs take part a key role for prohibiting and healing many infections or diseases. Most of the dangerous and high-risk diseases can be healed by taking appropriate medication. The system will give alert to the patient on time for their prescription and comprises of IoT medication reminder system. It will give an alert to the patient to take medicine on time by presenting them audio and visual warn.**

Index Terms **– Medication alerts, Supervisory of health, Arduino, RTC, GSM etc.**

1. INTRODUCTION

There are so many natural and unnatural disasters which may cause harm to humans and other living things. Of these fire is one of the major threat, which may cause huge damages [6]. Forest fire, short circuits and other situations creates large amount of fire and explosions. The major reasons of fire accidents are due to malfunctions of electrical equipment and wiring, improper handling of flammable materials, human errors and carelessness. The delayed actions and prevention against fire accidents may lead to large economic losses and even deaths to many. Older sensor based systems needs close proximity for detection and preventive measures like water spraying [3].

Then some more accurate systems like optical sensors to detect light and flame came. Advanced techniques like image processing, pattern recognition, transfer learning [20], computer vision, neural network etc. made it possible to detect images with most accuracy from images and even videos now. Thus CNN based fire detection provides a cost effective and accurate fire detection and it even gives possibilities to early stage prediction of fire which helps to prevent forest fires.

Ever since human being started building structures by using of wood rather than stone, fire has become the part of the total process. In actual case, there are many examples of fire outbreaks which causes a huge destruction latest example in india as capital New delhi where 27 peoples have to lose their life and more than 12 peoples got heavily injured as well as in lucknow city more than 12 fire incidents happen not as large a fire as the one in Chicago the year before or the fire that was ravage San Francisco just over three decades later Firefighting calls for capabilities in combating, extinguishing, and stopping hearth place, working and retaining hearth place branch device and quarters, and vast education in acting firefighting activities. Nowadays, many industries and residential have installed related fire safety and control arrangements such as fire alarm, fire extinguisher, water sprinkling supply system. But in actual practice these all-fire alarm and controlling systems they are not that much capable enough to take necessary action when fire is started that's why to protect life. The new way to avoid all the losses is to respond to emergency situations as quickly as possible. So, at that point comes the need of a upgraded fire detection systems. This project therefore look for to design an Arduino Fire Alarm and Controlling systems that will monitor the presence of significant quantity of tempreture and smoke and activate alarms and along with that switch off the mains of the building, send an SMS to respective send an SMS alert and location and extinguish the fire as a safety measure to contain the situation

The organizational framework of this study divides the research work in the different sections. The Literature survey is presented in section 2. Further, in section 3 shown Existing System is discussed and in section 4 shown in proposed system, In section 5 Experimental Results work is shown. Conclusion and future work are presented by last sections 6.

2. LITERATURE SURVEY

The proposed system of IoT is making powerful incursion in the medical field with the development of applicable sensors and devices. It is to make a convenient design that the sufferers can aware to take their regular medicines on time. The system includes chip, buzzer, and power supply. The connection contains sensors with the essential hardware components. All these modules are incorporate with the controller and implement using protocol such as I2C and SPI. The system is linked to the Wi-Fi and it will post all the information to cloud technology. The information stored in the memory card will transmit to the mobile application which acts as an approval for addressing through the internet [1].

Design of IoT structure is to establish medicine intake adherence where medicine intake action is allowed to

protect adherence. Moving signals are obtained from the wristwatch, using the acceleration sensor in the watch. The obtained information are send to the wireless system pouring water into the glass and take the medicine from the blister package can be performed by swapping their order. After identifying medicine intake, which type of medicine is taken will be find using RFID tags rested on the blister package. This system can be commercialized as a mobile application along with particular use of hardware [2].

It shows a device that is collected by various components that are direct by Arduino. There are various types of communication in each section. It might be one or two ways. The Arduino transmits instruction to the different section but also obtain information from them. When the alarm is set in the correct time and controller acquires the hour from the RTC. The alert will be informed to the doctor or the caretaker. Through all this operation the accurate hour will be displayed on the LCD and when the alarm is fixed it shows the details about the right dosage [3].

This system uses proposed module of Raspberry Pi. It is given to 5 V and 2 A power adapter if handled with coaxial cable. When the system is connected to the mobile, the cable will be changed by a USB Wi-Fi dongle suited with the Raspberry Pi. The internet link is initially required to renovate, enrich and download vital collections for the Raspberry Pi. The GPO of Raspberry Pi is attached to the LED's that is required to light up the correct dosage that is to be taken at the time and buzzer is further linked to the GPO of Raspberry Pi. It acts as audio alert to tell the patient to take up the right dosage. Although the patient takes a specific tablet, it is necessary to confirm their activity. The email alerting is conveyed to the patient and caretakers by default. Therefore, it is essential for the cellular phone to have gateway to the internet [4].

The proposed module can be divided into hardware and software. The software section will do the residue portion of the task, and that is to mention patients to take their medication along with how many tablets are expected to have. The alert can be set by using web app. The software need users to login, therefore the medicine can be connected with the calendar. Additionally, it will allocate a color to each medicine and when it's time for the alert, an LED of that color will be shifted on indicating that the correct time to take the tablets. The features are under no circumstances and can be easily accessible by the user. It is also useful for the working people with a hectic schedule by sending alert on the system [5].

3. EXISTING SYSTEM

In the existing system of the smart medicine remainder box it will blink led, based on the medicine number along with a buzzer. In this also they have used the arduino and an RTC module to get the current time and an LCD display and push buttons to set and observe the time. When it's time to take medicine, the buzzer will alarm along with the led blink. The main drawback in this is if the person is far away from the system, he won't get to know that it is medicine taking time.

4. PROPOSED SYSTEM

The main objective of our proposed system is to create a user-friendly design that the patients can use as a reminder alert to take their daily medication on time. In this based on time message will be sent to the user about medicines. Here time is fixed in web server, based on that message will be sent. Here we are monitoring health parameters like Heartbeat and Temperature of the person. All these parameters are updated to web server.

A. Block Diagram

This paper proposes a system for medication alerts and health supervision using IoT technology. The system is based on Arduino microcontroller, heart rate sensor, temperature sensor, RTC module, switch, GSM module, LCD display, and LED indicators. The system is designed to monitor the vital signs of patients and send alerts to caregivers in case of abnormal readings. The system also provides medication reminders to patients through LCD display and LED indicators. The proposed system can be useful in improving patient outcomes by ensuring timely medication intake and providing continuous monitoring of vital signs. The use of IoT technology makes the system more efficient and cost-effective than traditional monitoring systems. The system can be easily integrated into existing healthcare infrastructure and has the potential to revolutionize the way healthcare is delivered.

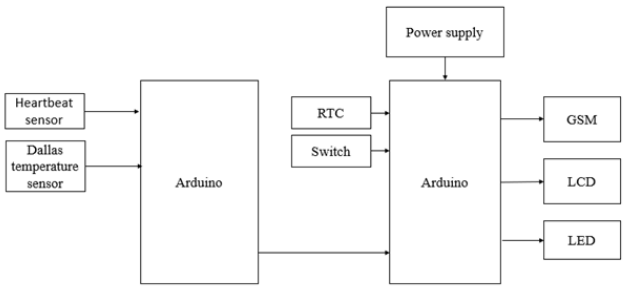

Fig.1: Proposed Block Diagram

A. METHDOLOGY

The operation for medication alerts and supervisory of health using IoT using Arduino, heart rate sensor, temperature sensor, RTC module, switch, GSM, LCD, and LED can be achieved through the following steps:

1. Set up the Arduino board and connect the heart rate sensor, temperature sensor, RTC module, switch, GSM module, LCD, and LED to the appropriate pins on the board.
2. Write the code in the Arduino IDE to read the heart rate and temperature values from the sensors, display the time from the RTC module on the LCD, and control the LED based on the switch input.
3. Set up a cloud-based database to store the sensor data and send alerts to the user's mobile phone if the heart rate or temperature values are outside the normal range.
4. Connect the GSM module to the Arduino board and use it to send SMS messages to the user's mobile phone if the

heart rate or temperature values are abnormal or if it is time to take medication.

5. Display the medication schedule on the LCD and use the switch to mark when the medication has been taken.
6. Continuously monitor the heart rate and temperature values and update the database with new readings.
7. Use data analytics tools to analyze the sensor data and identify trends or patterns that may indicate a potential health issue.

Overall, this system can help individuals monitor their health and medication schedule more effectively by providing real-time alerts and reminders through IoT technology.

B. HARDWARE DESCRIPTION

1. Arduino Uno

Arduino Uno shown in figure is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller shown in fig.2.

Fig.2: Arduino Micro Controller

2. *Dallas Temperature Sensor*

One-wire temperature sensors like the DS18B20 are devices that can measure temperature with a minimal amount of hardware and wiring. These sensors use a digital protocol to send accurate temperature readings directly to your development board without the need of an analog to digital converter or other extra hardware. It works on the principle of direct conversion of temperature into a digital value. Like, it changes a bit in 9. 10, 11, and 12 bits as temperature changes in values 0.5 ° C. 0.25°C,1.25 and 0.0625°C respectively. Shown in fig.3

Fig.3 Dallas Temperature Sensor

D. Heart Beat Sensor

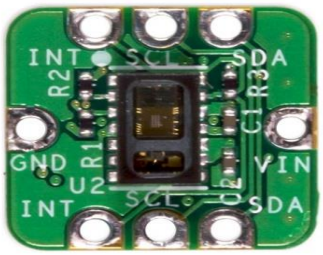

Fig.4 Heartbeat sensor

Figure 4 shows pulse oximeter . The heart rate measure kit can be used to monitor heart rate of maternal. The result can be displayed on a screen via the serial port. It is designed to give digital output of heart beat when a finger is placed on it. Operating voltage is +5V regulated and the operating current 100mA. The entire system is a high sensitivity, low power consumption and portable.

4. Power Supply

Power Supply shown in figure 5 The system is powered by a battery source of 9 V that is connected to the input pin of voltage regulator (L7805) to get a proper output voltage at the output pin of voltage regulator equal to 5 V or to step down the voltage from 9 V to 5 V, which is required for Arduino microcontroller.

Fig.5: Power Supply

8. LCD Display

LCD stands for liquid crystal display, which is used to show the status of an application, displaying values, debugging a program, etc.A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols.

This LCD has two registers, namely, Command and Data. Shown in fig.6.

Fig.6: 16x2 LCD Display

9.GSM

GSM shown in Fig.7 is a mobile communication modem; it is stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.

Fig.7: GSM

RTC Module

RTC module shown in figure 8 is a single packaged module which integrated RTC IC, oscillator circuit and master clock. There is no need for oscillator circuit design and frequency. An RTC module keeps track of time once an initial time input is provided to it. This input can come from several sources. The RTC module usually comes with its own crystal oscillator, and even its own battery, so that the timekeeping continues, even if there is a power disturbance on the Arduino.

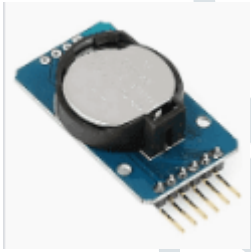

Fig.8: RTC Module

5. EXPERIMENTAL RESULTS

The MEDICATION ALERTS AND SUPERVISORY OF HEALTH USING IOT system that you described uses a combination of hardware components and software to monitor a patient's vital signs and alert healthcare providers when necessary.

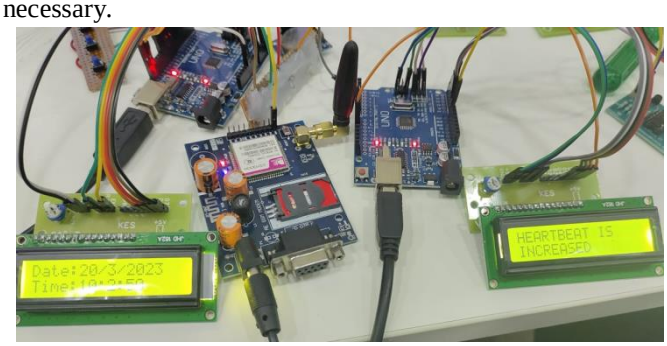

Fig.9 Experimental setup

The Arduino is a microcontroller board that serves as the main control unit for the system. It is responsible for processing input from the various sensors and triggering alerts when necessary.

The temperature sensor is used to monitor the patient's body temperature, which is an important indicator of their health status. It measures the temperature of the patient and sends the data to the Arduino for processing.

The heart rate sensor is used to monitor the patient's heart rate, which is also a critical indicator of their health. It measures the patient's heart rate and sends the data to the Arduino for processing.

The RTC (Real-Time Clock) module is used to keep track of the current time and date. This is important for accurately timestamping the data from the sensors and for triggering alerts at specific times.

The GSM module is used to send alerts to healthcare providers. When the system detects a problem with the patient's vital signs, it sends a message to a designated phone number or email address, alerting healthcare providers to take action.

The LCD display is used to provide a visual interface for healthcare providers to view the patient's vital signs and current status. It displays the patient's temperature, heart rate, and any alerts or messages that have been sent.

The LED indicator is used to provide a visual indication of the system's status. It can be programmed to light up or blink in different colors to indicate when the system is functioning normally or when there is a problem that requires attention.

Overall, the MEDICATION ALERTS AND SUPERVISORY OF HEALTH USING IOT system is designed to provide continuous monitoring of a patient's vital signs and to alert healthcare providers when necessary, helping to improve patient outcomes and ensure timely medical intervention when needed.

6. CONCLUSION

In conclusion, the MEDICATION ALERTS AND SUPERVISORY OF HEALTH USING IOT system is a powerful tool that can be used to improve patient care and outcomes. By using a combination of hardware components and software, the system is able to monitor a patient's vital signs in real-time and alert healthcare providers when necessary. The use of an Arduino microcontroller board, temperature and heart rate sensors, an RTC module, GSM, LCD display, and LED indicator allows the system to be highly customizable and adaptable to the needs of individual patients and healthcare providers.

Future Scope

The system could be enhanced by incorporating machine learning algorithms to better analyze and predict patient health patterns, helping to identify potential health risks and prevent medical emergencies before they occur.

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