IOT Based Patient Health Monitoring And Smart Medicine Box

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ABSTRACT

With swiftly growing population, it has come extremely delicate to cover as well as look after the health of the cases who suffer from habitual conditions especially in the case of aged people who find it delicate to look after their own characters. Hence we have come up with a smart system that can cover the health and the case's capsule. A smart sensor will continuously cover the health of the case and shoot the readings to the Arduino board. The Arduino board will also be connived with boxes that will contain specified medicines for the case. Each box will have its own timing information which will be continuously compared to real world time. If the information matches the alarm will start to ring and will remind the case to take his medicine.

INTRODUCTION

Now a day's trend in healthcare is to move routine medical checks and other health care services from sanitarium to the home terrain. A ultramodern healthcare IoT platform with an intelligent drug box along with detectors for health monitoring and opinion is proposed then. The life expectation of the human has been increased because of the advances in the drugs. For utmost cases, cases will forget to take the drugs at the specified time. As a design, the anticipated remedy becomes veritably delicate for senior people to follow a drug that has inadequate knowledge. The people who need to take lots of drugs daily will find it delicate to flash back the time and drug details. For those people, drug input at the right time is the veritably most important thing. Home healthcare plays a major part in reducing the consumption of treatment. People can get the services fluently through advanced health care technologies. Through IoT, we can give better treatment because medical fields are more functional than other fields. So IOT is stopgap in the healthcare field. In real- time monitoring, cases can ameliorate their quality of health.

LITERATURE SURVEY

W. Antoun et al..[1] The technique of the suggested prototype system is described in this section. The SMD design and its external peripherals are explained. In this study, we developed an Android application that is in charge of managing the entire system. F. Kleinsinger et al..[2]proposed.'ssystem, Thescience of human behavioural modification can be used to help patients adopt healthier lifestyles and create healthy habits in order to help patients adhere to taking their prescriptions more consistently. K. Karthikeyan et al..[3] A study suggested deploying a separate bot to oversee the administration of medications. The bot will move to the user's home and dispense the necessary medications in accordance with the user's preprogrammed orders.. Latif, G. et.al..[4] proposed design After seeing so many of these cases the correct person must take the correct pill at the correct time, otherwise taking an incorrect one or not taking one at all may expose thepatient to several dangerous situations, ranging from mild health issues up to death. Neiman, A. B. et.al..[5] Given a purpose, the Internet of Things (IoT) is not only a concept but an architecture that facilitates the interconnection between people, systems, and devices of any kind. When the resources amalgamate with respective people, it can solve issues known to humanity for several years. Medication non adherence is expected for patients with chronic infections, concerning as many as 40% to 50% of patients prescribed medications to manage chronic conditions like diabetes or hypertension. Pandey, P. et.al..[6] Design proposed system Smart Medicine Dispenser (SMD) was also developed, containing all the recommended dosages for a fortnight or a month and dispensing them at the correct timings with the correct quantity. Rao, A. et.al..[7]methodology of proposed system. An IoT-based programmable innovative medicine kit guides users/nurses to manage the precise medication at the correct time schedules through a unique alarm system that includes buzzers, mobile notifications, and LED signals on the equipment sections. The parts containing suitable tablets are unlocked at the prearranged time.Samhitha, S.et.al..[8] Proposed prototype system. In the study, NodeMCU ESP8266, an Android; microcontroller with an inbuilt Wi-Fi component, is utilized for development. The Xcluma 28Ybj-48 stepper motor is used to rotate the medicine container. The stored history is also displayed to the user, which has the list of alarms successfully given the alarm, and the rotation of the container completed successfully. A medical alert is sent to the caretaker via a notification using the Android Application if the medicine is not taken within a specified time and specified dosage.Salama, Dr-Diaa&Abd-ELfattah, Mohamed et.al..[9]Proposed prototype system. After seeing so manyof these cases,the correct person must take the correct pill at the

correct time, otherwisetaking an incorrect one or not taking one at all may expose thepatient to several dangerous situations, ranging from mildhealth issues up to death. Shaikh S.A.et.al..[10]Designed The Medicine reminder system consists of a pillbox provided with a set of compartments. It is designed in such a way that normal people can use it easily for their medication. The pill box's control system consists of LEDs for giving visual alerts to the patient for medicine. There is a buzzer in the system which alerts the patient in audio form.

EXISTING SCHEME

In Existing system, case needs to get rehabilitated for regular monitoring of the case. It isn't possible once he she is discharged from the sanitarium. This system can not be used at home. The being systems are measuring the health parameters of the case and shoot it through break freak, Bluetooth protocol etc., These are used for only short range communication to transfer the data. Not all the time the croaker can cost these details. The block illustration of patient monitoring system is shown in figure. Then three IoT biomedical detectors named as temperature detectors, blood pressure detectors and palpitation rate detectors are connected to AVR regulator. They will smell medical parameters with respect to the three detector also with the help of MQTT(Communication Que Telemetric Transfer) publish- subscribe protocol the information of the case is transferred on pall through wi- fi module and using
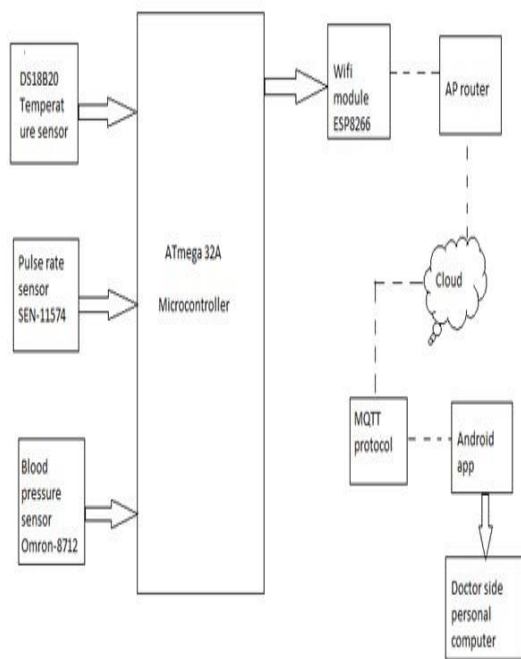

Fig.no:1-Block Diagram of Existing System

PROPOSED SCHEME

A smart system that will continuously cover the case's health with the help of a detector and also at the same time will cover the patient diurnal cure of drug. Each drug box will have its own set of timing information which will be compared to a real worldclock. However, the buzzer will go out and thereby remind the case to take his/ her drug, If the information matches. A data will also be maintained regarding the case's health and his diurnal input of drugs. Propose a smart system that will continuously cover the case's health with the help of a detector and also at the same time will cover the cases daily cure of drug Each drug box will have its own set of timing information which will be compared to a real worldclock. However, the buzzer will go out and thereby remind the case to take his/ her drug A data

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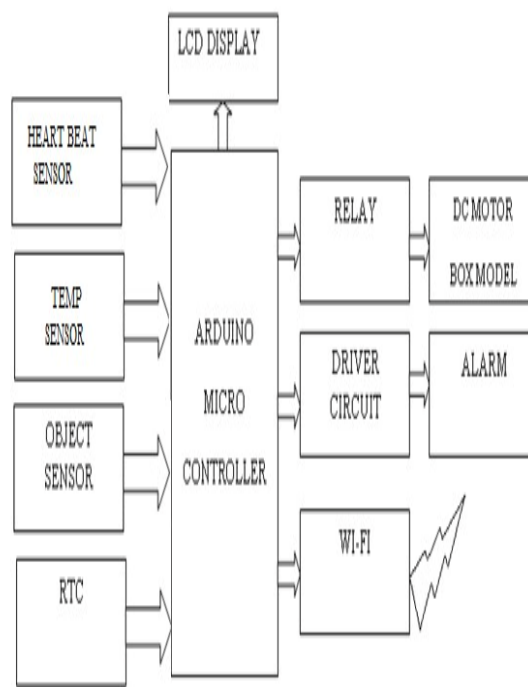
PROPOSED BLOCK DIAGRAM

Fig.no:2-proposed block diagram

ARDUINO UNO

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. 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; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.
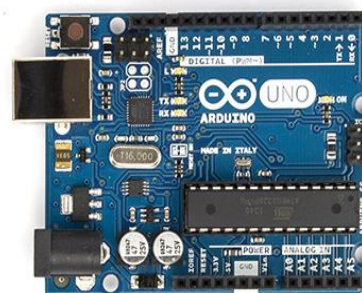

Fig.no:3-Arduino UNO

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.In the UNO you can find two 6 pin connectors. One is near the USB – TTL Chip and the other one is at the end of the board. These pins are used to program those two microcontrollers. The USB – TTL chip on this board is an ATMgega16U. The connector marked as 1 is used to program

the USB-TTL firmware into this chip. And the connector marked as 2 is used to burn the bootloader into the ATMega328 microcontroller. Arduino UNO ISCP Pins Reset Button. As the name indicates this tactile switch is used to reset the ATMega328 microcontroller. It's connected to the PC6/Reset pin, which is pulled up through a 10K.

LCD DISPLAY

Fig.no:4-LED Display

A **liquid crystal display** (**LCD**) is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs do not emit light directly.They are used in a wide range of applications including: computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. LCDs have displaced cathode ray tube(CRT) displays in most applications. They are usually more compact, lightweight, portable, less expensive, more reliable, and easier on the eyes. They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they cannot suffer image burn-in.LCDs are more energy efficient and offer safer disposal than CRTs. Its low electrical power consumption enables it to be used in battery-powered electronic equipment. It is an electronically-modulated optical device made up of any number of pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in colour or monochrome.

HEART BEAT SENSOR

Fig.no:5-Heart beat sensor

A device for holding a heartbeat sensor in a relatively fixed relationship with respect to the end of a user's fingertip. More particularly, a device is disclosed wherein a single sheet of resilient material is formed into a base portion for holding the heartbeat sensor and three resilient bands that extend upwardly therefrom. The bands are adapted to grip the user's fingertip. In one embodiment of the invention, the bands and base portion define a U-shaped channel of constant cross-sectional area. In this embodiment a holding structure for the heartbeat sensor is wedge-shaped, the wedge-shaped holding structure being adapted to be held by the base portion so that the cross-sectional area defined by each band and the wedge-shaped holding structure decreases along the longitudinal length of the base portion. In another embodiment of the invention, each band defines a smaller cross-sectional area with respect to the base portion. Thus both embodiments result in more pressure being applied to the sensor at the portion of the user's fingertip closest to the end.The invention provides a device for holding a heartbeat

sensor in a relatively fixed relationship with respect to a user's fingertip. The device includes a base portion for holding the heartbeat sensor, and a pressure producing means connected to the base portion for holding the user's fingertip against the heartbeat sensor, the pressure producing means including means for causing pressure between the heartbeat sensor and the user's fingertip to be greater at the portion of the user's fingertip closest to the end than at the portion of the user's fingertip furthest from the end.

TEMPERATURE SENSOR

Fig.no:6-temperature sensor

A thermistor is a type of resistor whose resistance varies with temperature. The word is a portmanteau of *thermal* and *resistor*. Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements. Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure metals. The temperature response is also different; RTDs are useful over larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range [usually −90 °C to 130 °C].

RTC

Fig.no:7-RTC

A **real-time clock** (**RTC**) is a computerclock (most often in the form of an integrated circuit) that keeps track of the current time. Although the term often refers to the devices in personal computers, servers and embedded systems, RTCs are present in almost any electronic device which needs to keep accur.

ALARM

An **alarm** gives an audible or visual warning about a problem or condition.

BUZZER

Buzzer is used to alert and warn those working nearby of danger, a buzzer is utilised in conjunction with a beeping sound. The system's output is a buzzer. The buzzer makes a beep-beep sound to signal danger. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automobile electronic equipment, telephones, timers, and other electronic products for sound devices. 5 volts of an active buzzer Rated power may be instantly connected to a continuous sound. This section's sensor expansion module and the board work together to create a straightforward circuit design.

Fig.no:8-Buzzer

RELAY:

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are doublethrow (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical.

The coil of a relay passes a relatively large current, typically 30mA for a 12V relay, but it can be as much as 100mA for relays designed to operate from lower voltages. Most ICs (chips) cannot provide this current and a transistor is usually used to amplify the small IC current to the larger value required for the relay coil. The maximum output current for the popular 555 timer IC is 200mA so these devices can supply relay coils directly without amplification.

Relays are usually SPDT or DPDT but they can have many more sets of switch contacts, for example relays with 4 sets of changeover contacts are readily available. Most relays are designed for PCB mounting but you can solder wires directly to the pins providing youtake care to avoid melting the plastic case of the relay. The animated picture shows a working relay with its coil and switch contacts. You can see a lever on the left being attracted by magnetism when the coil is switched on. This lever moves the switch contacts. There is one set of contacts (SPDT) in the foreground and another behind them, making the relay DPDT.

WORKING

IOT based smart medical box will continuously monitor the health of the patient and send the readings to the Arduino board. The Arduino will also be interfaced sensor and boxes that will contain prescribed medicine for the patient. Each box will have its own timing information which will be continuously compared to Real Time Clock (RTC). If the information matches the alarm will start to ringing and will remind the patient to take his medicine. In this system the parameters are collected from the sensors are analyzed if any abnormal reading are found in Pulse or Temperature this system will inform the Doctor using IOT and will active the Medical Box depend upon its need.

CONCLUSION

Health IOT thus helps the hospital authorities to have continuous monitoring on the patients as well as it reminds the patient to have the medicines in time. So the doctor can have direct view over his patients by this. Thus the medication procedures can be shifted from hospital centric to home centric. Earlier the medicine box proposed with heartbeat sensor, temperature sensors and object based sensors. These sensors may have less reliability because of ambient light and improper calibration problems. So, the proposed relay is rugged in operation which is operated by means of DC motors. The DC motors are having controlled signal from Arduino microcontroller.

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