Advanced Medical box for Distance Patient Supervising Using RTOS

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Abstract- A desirable system should be capable of taking care of the patients from all aspects, covering personalized medication, important signs observation, on-the-scene designation and interaction with remote physicians. The project provides AN experimental plan of patient's health condition. the platform involves 1) AN open-platform-based intelligent medication box (iMedBox) with increased property and interchange ability for the mixing of devices and services, 2) intelligent pharmaceutical packaging (iMedPack) with communication capability enabled by ZigBee and feat capability enabled by purposeful materials, and 3) versatile and wearable bio-medical device (Bio-Patch) enabled by the progressive inkjet printing technology and system-on-chip. The planned platform seamlessly fuses IoT devices (e.g., wearable sensors, intelligent medication packages, etc.) with in-home aid services (e.g., telemedicine) for improved user expertise and repair potency. The practicableness of the enforced iHome Health-IoT platform has been well-tried in field trials. This project gives the perfect timing with the output at the real time if the patient has taken the tablet or not. This system act as a real time medical reminder system.

Keywords- Arduino UNO, real time medical reminder, iMedPack, ZigBee, Healthcare-IOT.

I.   INTRODUCTION

In daily life most of the folks got to take medicines that wasn't there in past number of years and therefore the reason behind this is diseases area unit increasing in great deal. Thus sooner or later many folks are available in contact with these diseases. Some diseases area unit temporary diseases whereas several area unit permanent life threatening diseases. Life threatening diseases gets mixes with the human body in such the way that they can't leave the body ever and that they will increase in fast time. Life of humans became less because of such diseases and to beat or to measure a higher life we'd like to require medicines frequently and conjointly in great deal. We need to be in recommendation of Doctor WHO tells US to require desired pills in desired manner in order that patients face issues like forgetting pills to require at right time and conjointly once Doctor changes the prescription drugs of drugs of medication patients need to bear in mind the new schedule of medicine. This drawback of forgetting to require pills at right time, taking wrong medicines and accidentally taking of expired medicine causes health problems with patient and this ends up in suffer from unhealthy life. Our project is to try and made Arduino-Uno based mostly Smart drugs box that uses Real clock. The new expected feature in our project is our system is wise that patient has taken drugs or not and therefore the patient can't put off the time on that he must take pills. It's required for the patient to take pills from the box at the proper time otherwise our systems continues to create giant sound till the medication is taken out from the box. This notification feature adds life years to the patient and therefore this factor isn't obtainable in any device that is that the necessity for gift days.

a.   Remote Monitoring

The proposed system includes an intelligent medical reminder system which will automatically switch on the light when the patient has to take the medicine and as the patient take the meditation they will press the switch the physical button which gives the reply to the reminder that patient has taken the tablet or not. The status is being given using the IEEE 802.11 b/g/n standard on the web page stored in the server. Through this the person can monitor and remind the patient to take the medicine in time with a real time medical reminder kit.

II.   SYSTEM DESIGN&ARCHITECTURE

A.   System Architecture

In the proposed system the combination of the Arduino with ESP8266 Wi-Fi module is made in which it has three LED's which represents the medical reminder of the person. The person will give the reminder to the patient by using a Wireless Local Area Network (WLAN) from where we will have three buttons, when pressed it will automatically switch ON the LED remotely to give the indication to the patient to take the medicine. As the patient gets the reminder they will take the medicine when patient has taken the medicine a physical switch will be at the patient, as the patent take the meditation they will press the button to reply back that they have taken the meditation.

The remote controlling of the person's medical reminder is monitored by the web page which can be accessed by the IP address of the NodeMCU as it act as the server.

Bio –Patch with imedi Pack:

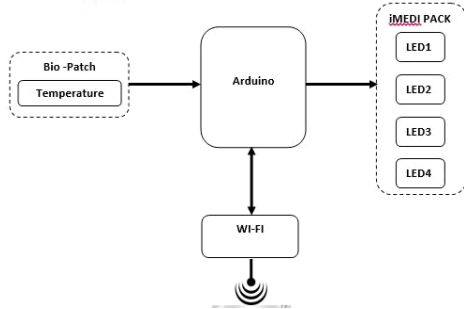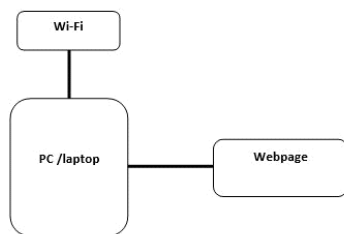Fig.1: Medical Reminder

iMediBox with IOT

Fig.2: Patient Reminder

The heart of this system is the core module which is realized using the Arduino UNO, its responsibilities include, and acquiring the power consumption, processing the acquired electrical devices, NodeMCU is requires to transmit the information to the user using IP protocol.

III. SYSTEM DESCRIPTION

This section gives an overview of the various concepts, components and modules of the proposed system.

A. ARDUINO UNO

Arduino is a single-board microcontroller meant to make the application more accessible which are interactive objects and its surroundings. The hardware features with an open-source hardware board designed around an 8-bit Atmel AVR microcontroller or a 32-bit Atmel ARM. Current models consists a USB interface, 6 analog input pins and 14 digital I/O pins that allows the user to attach various extension boards. The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable or with a AC-to-DC adapter or battery. Arduino Uno Board varies from all other boards and they will not use the FTDI USB-to-serial

driver chip in them. It is featured by the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. It also supports serial communication using Tx and Rx pins.

Fig.3: ARDUINO UNO

B. NodeMCU

NodeMCU is an open source LUA based firmware developed for ESP8266 Wi-Fi chip. By exploring functionality with ESP8266 chip, NodeMCU firmware comes with ESP8266 Development board/kit i.e. NodeMCU Development board. NodeMCU is an inexpensive and powerful development chip that have good I/O capabilities with GPIO pins and can also communicate with other devices using WiFi. This makes it ideal for our use to prototype in small-scale IoT applications.

Fig.4: NodeMCU

In this we will be using serial communication i.e. Tx and Rx to communicate with the Arduino-UNO.

C. Working of the iMedBox Kit

Reminder and the patient will be connected to each other with the wireless modem. The person will give the reminder to the patient by using a Wireless Local Area Network (WLAN) from where we will have three buttons in the server part i.e. in the NodeMCU, when pressed it will automatically switch ON the LED remotely to give the indication to the patient to take the medicine. The patient will have the LED's which will be connected to the Arduino. As the patient gets the reminder

they will take the medicine when patient has taken the medicine a physical switch will be at the patient, as the patient take the meditation they will press the button to reply back that they have taken the meditation. This kit works as a real time meditation reminder.

IV.   HARDWARE IMPLEMENTATION

This section emphasizes on the actual hardware implementation of the proposed system, the various modules, components, peripherals and the interconnections between them are discussed here.

The first stage of the implementation is to prepare Arduino Uno with the development of the set of instructions with the embedded C, here it is given a power supply of 5Volts.

The server side will be the reminder and at the patient side there will be LED's which will give the reminder for taking the medicines which are connected to the Arduino UNO microcontroller which take all the data from the server and is connected to the NodeMCU with the serial communication, where NodeMCU collect all the information and transmits it as a wireless communication medium.

Using Embedded C programming language the set of instruction is given in such a way that it will automatically collects the information from the sensor and transmits it using the IEEE 802.11 standard.

V.   PRINCIPLE OF OPERATION

The main purpose of this project is to give real time medicine reminder of the person with wireless medium using IEEE 802.11 standard. Here NodeMCU which consist of the ESP8266 module is used. The ESP8266 SoC contains a fully functional WiFi Stack and TCP/IP Stack that allows any Microcontroller to get connected to WiFi Network. With Software Development Kits (SDKs), you can directly program the ESP8266's on-chip Microcontroller, without the need for an external Microcontroller. Now Embedded C programming language is used to program the Arduino UNO it is given with set of instruction which will collect the information from the sensors and send it to the NodeMCU using serial communication. Now NodeMCU will act as server, the information which it received from the serial communication will transfer through the IP protocol a small web page is designed in which the reminder will press the buttons at the time of meditation which will give the indication through the LED's for the medication as the patient take the meditation they will press the button and a reply will be sent back to the server that the patient has taken the medicine.

VI.   CONCLUSION

The goal of our project is to provide healthy and tension free life to those users who are taking regularly pills and to provide this product at affordable cost also. Our project is also reusable by exchanging those other medicine box that has only alerting system and are non-usable or unaffordable compare to our product. This project works in real time instead of using the manual method of forgetting the medicine or someone has to give the medicine to take care of them. Main advantage is the wireless communication which will host a web page in the server in order to have a communication between the patient and the reminder.

VII.   REFERENCES

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