

Automatic Medicine Dispenser

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Abstract - It is critical to administer timely medication to the elderly. The automatic medicine dispenser is made for people who take drugs without the supervision of a doctor. It frees the user from the risky chore of giving the wrong medicine at the wrong time. A NodeMCU ESP8266 (1 no), CD Drivers (4 no), 12V DC Relay (6 no), BC 547, Transistor (6 no), Resistor 1 K ohm (6 no), 1n4007 diode (6), Dot board, 12V 2.5 amp adaptor are the main components of this pharmaceutical dispenser (1 no). For use in construction, foam plastic is used. The general purpose is to make it easier for the user to specify the timings for dispensing multiple pills at specific times. In developing countries, caring for the elderly is a major concern. Family members are in charge of the elderly's care and management. It is difficult for family members to be available all of the time to help the elderly in today's world. In today's society, the majority of families are nuclear. Although the elderly wish to be self-sufficient, their desire for independence is understandable, it is a source of concern for their children. Despite their greatest efforts, the elderly sometimes forget to take their prescription on time. One method for assisting them in taking their medications effectively is to use an automatic medication dispenser. As the expense of in-home medical care rises, it has become increasingly important for people to choose a device that can efficiently manage their drugs. The purpose is served by the automatic drug dispenser.

The main goal is to keep the gadget simple and inexpensive. The software that is being used is dependable and stable. The elderly can benefit from this gadget since it eliminates the need for costly in-home medical care.

Keywords-Dispenser, microcontroller, Blynk app, aurdino uno .

INTRODUCTION

Routine medical checks and other health care services are now being moved from hospitals to patients' homes, which is a promising trend in healthcare. Patients can obtain health care more easily as a result of this, particularly in the event of an emergency. Furthermore, hospitals might reduce their workload by transferring possible and simple chores

to the home environment. One significant benefit is the cost savings. If the proper medicines are taken at the right time, the patient's condition is less likely to deteriorate. Getting the appropriate drug to the right person at the right time is a huge difficulty for the elderly. They could forget to take their medications on time. As a result, poor drug adherence is a significant issue for both the patient and the physician.

A sophisticated healthcare IoT platform that includes an intelligent medical box and a health-monitoring sensor. In the medical industry, IoT-based healthcare services offer a lot of potential.

We discovered that over 60% of persons over the age of 60 have a poor medical history after conducting study.

The main cause of these was a failure to adapt suitable medication. An intelligent home-based smart medical box that can monitor a patient's health by keeping track of medications taken and allowing doctors to view the patient's medical history through the internet.

The primary motivation is to bring the medical and technological fields closer together and create something creative to address the present medical crisis.

OUR PROPOSED SYSTEM

We created a smart pill box to ensure that people take their medications according to the timetable.

The pill box receives the schedule/configuration data via the mobile app (blynk). Node MCU, OLED display, LEDs, buzzer, and buttons are all included in the smart pill box.

The commands in the pill box are shown on the OLED by the Node MCU, which has a built-in Wi-Fi module.

The Wi-Fi module is set up as PILL BOXAP, which means that the IP address is generated on the local network by pairing the PILLBOXAP IP address with the Mobile App.

When the configuration is turned on, the configuration data is sent to the smart pillbox.

At the appointed moment, the concerned LED illuminates with a buzzer.

METHODOLOGY AND IMPLEMENTATION

The complete system is set up in the following way: once the power is turned on, the entire medicine box is initiated. Once initiated, the circuit is set up according to the real time clock. The touch sensor for each slot or box is configured according to the real-time clock to determine how many intervals the box should be initiated. For example, box 1 is set for twelve hours, box 2 for 'n' hours, and so on. This procedure is repeated as many times as necessary. Any other health monitoring sensor can be connected to the NodeMCU ESP8266 board to detect a

diabetic patient's glucose, which can then be stored in the cloud.

DESIGN CONSIDERATIONS

1.HARDWARE COMPONENTS

I. NodeMCU ESP8266- The ESP8266 is a self-contained WiFi networking device that may be used as a bridge between current microcontrollers and WiFi, as well as execute self-contained applications. This module has a built-in USB connector as well as a large number of pin-outs. The Espressif ESP8266 is a microcontroller created by Espressif Systems. You may attach the NodeMCU devkit to your laptop through a micro USB cable and flash it just like an Arduino. It's also breadboard-friendly right away.

II. CD Drivers- Compact discs, usually known as CDs, are compact plastic discs that are used to store and retrieve medications.

III. 12V DC Relay- A DC relay uses a single coil of wire wound around the iron core to make the electromagnet. When the DC coil is energized, the magnetism generated in the core is steady because the DC just keeps going. 12V DC relay switches are the best solution for full voltage applications, as they allow a low current flow circuit to control a high current flow circuit, like a vehicle's horn, headlights, auxiliary lamps, fan motors, blower motors and countless pieces of equipment existing on vehicles today. the relay has 12V

trigger voltage we have used a +12V DC supply to one end of the coil and the other end to ground through a switch.

IV. BC 547 Transistor- BC547 is an NPN transistor hence the collector and emitter will be left open (Reverse biased) when the base pin is held at ground and will be closed (Forward biased) when a signal is provided to base pin. BC547 has a gain value of 110 to 800, this value determines the amplification capacity of the transistor.

V. Resistor 1 K ohm- A resistor lowers (or resists) current flow. The resistance is measured in ohms and is expressed as a number. A 1k resistor, for example, has a value of 1,000 ohms. So a resistor with a value of 7000 ohms is also known as a 7K resistor..

VI. 1n4007 diode-1N4007 is a member of the 1N400X silicon family. It is a general-purpose rectifying diode used in electrical products to convert alternating current signals (AC) to direct current signals (DC). 1 denotes a single intersection. N stands for semiconductor diode, and 4007 is the diode's unique identification number. The 1N4007 is a rectifier diode with a PN junction. These types of diodes only allow electrical current to travel in one way.

VII. Dot board- Perfboard is a prototyping material for electronic circuitry (also called DOT PCB). It's a thin, stiff sheet with holes pre-drilled at regular intervals throughout a grid, often a square grid with spacing of 0.1 inch (2.54

mm). Round or square copper pads encircle the holes, but bare boards are also available. Printed circuit boards (PCBs) are at the heart of nearly every Internet of Things (IoT) gadget. PCBs that are well-designed are required for successful IoT products.

VIII. 12V 2.5 amp adaptor-

A 12V DC device necessitates the use of a 12V DC adaptor. Because the greater amperage (amp) power source doesn't have to work as hard to handle a smaller load, it will run cooler and more consistently. The difference between a DC adaptor and an AC adaptor is that a DC adaptor transforms AC electricity into DC electricity.

2.SOFTWARE COMPONENTS

- Blynk App with IOT
- Aurdino UNO Software

1. Blynk App with IOT- Blynk is a platform that allows you to control Arduino, Raspberry Pi, and other devices via the Internet using IOS and Android apps. It's a digital dashboard where you may drag and drop widgets to create a graphic interface for your project.

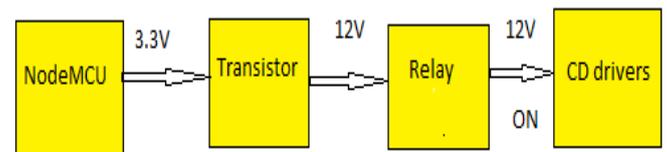
Create an account and log in after downloading the app.

The following page appears after a successful login.

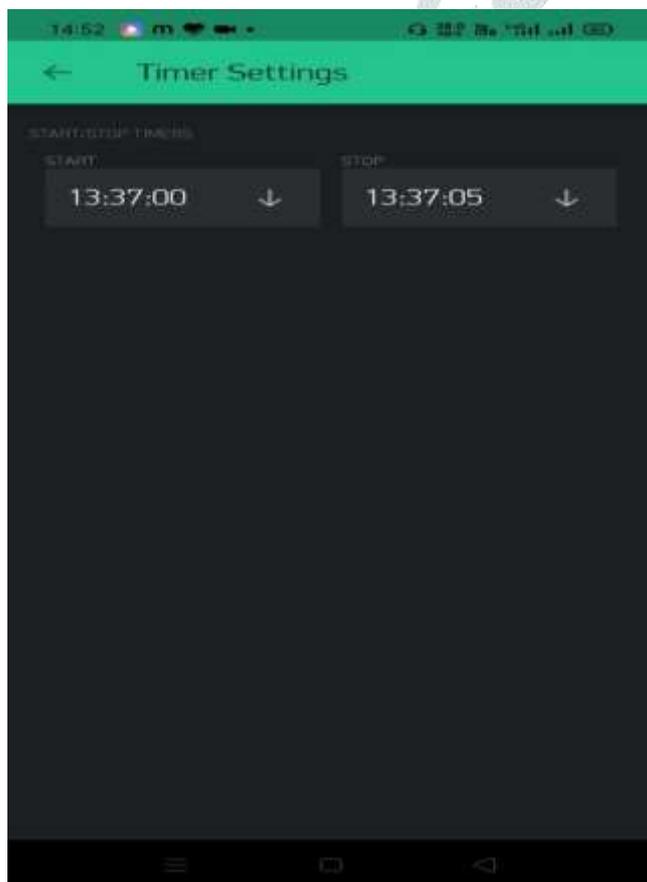


2. Aurdino uno software- The Arduino UNO is an Arduino standard board. UNO is an Italian word that signifies "one." The first release of Arduino software was given the designation UNO. It was also Arduino's first USB-connected board. It is regarded as a powerful board that is employed in a variety of tasks.

BLOCK DIAGRAM OF INTERNAL CIRCUIT DIAGRAM

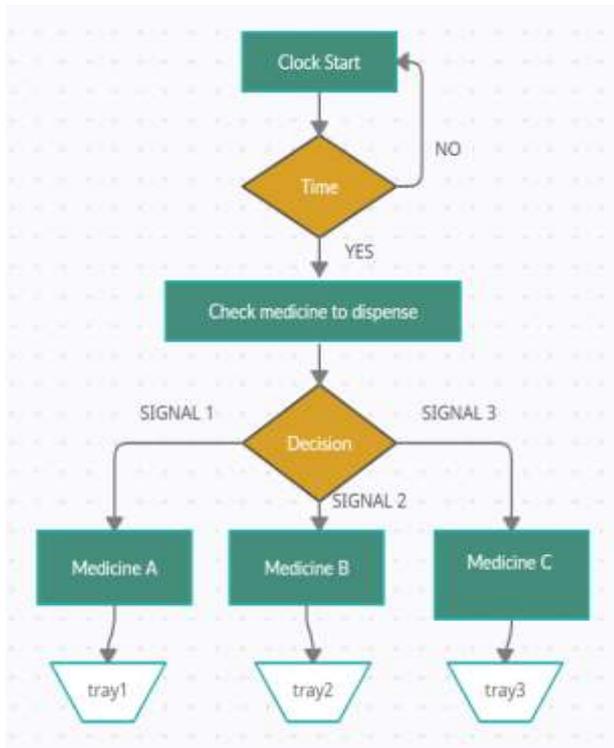


INTERNAL CIRCUIT DIAGRAM



A programmable WIFI module is included in the NodeMCU microcontroller. A transistor is a semiconductive device that transfers a weak signal from a low-to-high-resistance circuit. This means that the microcontroller's output is just 3.3V, but the CD drivers used as trays only work at 12V. As a result, the transistor takes the input from the NodeMCU and outputs 12V to the relay. A relay is an electrically controlled switch that is used to regulate a circuit using an independent low-power signal. That is, the relay receives the transistor's input and opens the trays at the predetermined time.

FLOWCHART



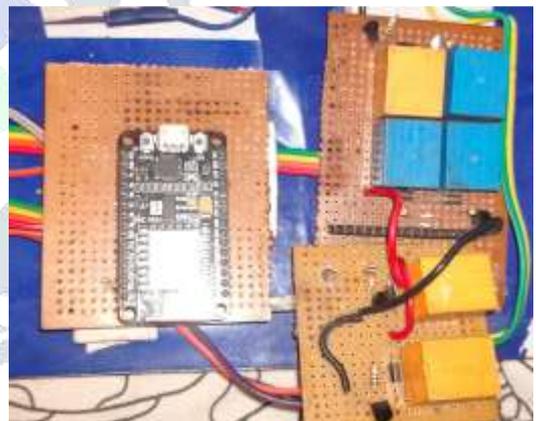
EXPLANATION

If we enter some credentials and login to the Blynk app, the below screen appears, which includes the current time, date, individual box timings, and button on-off. If the start time is set to 13:37:00, the box will be opened, and if the end time is set to 13:37:05, the box will be open for that length of time before closing automatically. Each box is treated the same way. The time restriction between boxes should be at least 1 minute. We can customise the box's start and finish times to suit our needs (the time we want the box to remain opened). When we have to take many medicines at once, we schedule them according to the amount of time we need to take each one. We can preserve the same timings for the night time and so on if it's done for, say, after lunch meds. We must first turn on the phone's hotspot and feed electricity to the device, after which the gadget's wifi will automatically connect to the phone's hotspot.

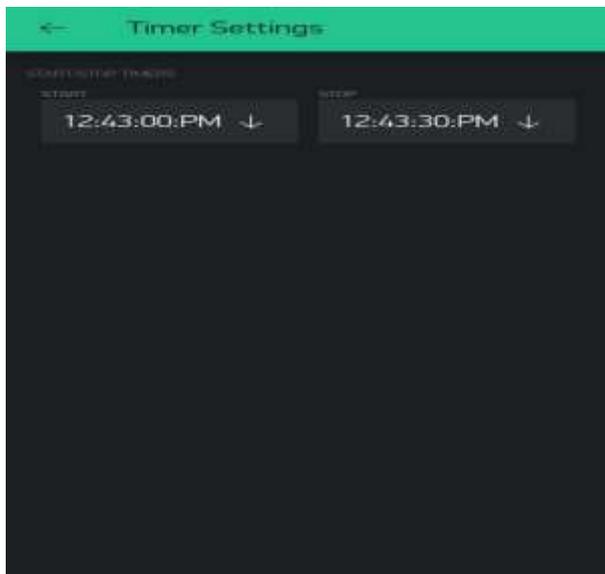
RESULT



This is the medicine dispenser which we get after successful result



This is the circuit for the device.



The box/trays come out according to the start and finish times, and after that period of time has passed, we can take our medicines on time without the chance of forgetting them, which could become a major problem.

CONCLUSION

This approach can assist doctors in easily monitoring a large number of patients' health and keeping track of their daily medical doses. This medication box is an active assistive project that goes beyond the traditional passive methods of assisting a patient and keeping track of his or her health.

REFERENCES

- [1] W. Antoun, A. Abdo, S. Al-Yaman, A. Kassem, M. Hamad and C. ElMou Cary, "Smart Medicine Dispenser (SMD)," 2018 IEEE 4th Middle East Conference on Biomedical Engineering (MECBME), 2018, pp. 20-23, doi: 10.1109/MECBME.2018.8402399.
- [2] Jyothis Philip , Feba Mary Abraham , Ken Kurian Giboy , B J Feslina, Teena Rajan, 2020, Automatic Medicine Dispenser using IoT, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 09, Issue 08 (August 2020).

[3] Mukund, S. (2012). Design of Automatic Medication Dispenser. Computer Science & Information Technology. 2. 251-257. 10.5121/csit.2012.2324.

[4] Natarajan Meghanathan, et al. (Eds): SIPM, FCST, ITCA, WSE, ACSIT, CS & IT 06, pp. 251–257, 2012.© CS & IT-CSCP 2012.

[5] W. Antoun, A. Abdo, S. Al-Yaman, A. Kassem, M. Hamad and C. ElMougary, "Smart Medicine Dispenser (SMD)," 2018 IEEE 4th Middle East Conference on Biomedical Engineering (MECBME), 2018, pp. 20-23, doi: 10.1109/MECBME.2018.8402399.

