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SMART MEDICATION DISPENSER

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Abstract:

We all know at least one person who must take medication in the form of pills or tablets in order to live a healthy life in this day and age of modern medicine, when humans are mostly dependent on the use of pills or tablets. In this project, we're primarily concerned with ensuring that your loved ones, who may be elderly, experiencing memory loss, or struggling to remember their medication schedule, take their pills on time, all over the world, with the help of a smart medication dispenser that works on a schedule. This project involves designing and building the final product's body as well as its component pieces. We always want the people we care about to be fit and healthy. And what would happen if they fall unwell and neglect to take their medication on schedule? Surely we would be concerned? Reminding every patient to take their medication on time can be challenging in hospitals due to the large number of patients. In the past, people had to actively remind themselves to take their medications on schedule. it is not the case in the digital age, and we can accomplish it using machines. Smart Medicine Reminder has a very broad range of applications that physicians can utilize in hospitals, at home, and in many other settings. There are numerous approaches to reminding When it comes to prompting, there are numerous approaches to do so Put it on show, Notify via phone or email, Making use of mobile applications, The buzzer sounds, Using WiFi and Bluetooth, Receive a call, Remember the current time and the medication time for the following day.

Key Words: Medication Schedule, Reminder Methods, Digital Age, Healthcare, Smart Medication Dispenser

1. Introduction

Building a smart medicine box with a microcontroller and GSM is our major ECE project. Users who routinely take pharmaceuticals or vitamin supplements are the target audience for our medicine box. It is essential for patients with certain chronic illnesses, such as HIV/AIDS, cancer, diabetes, and tuberculosis, to take all prescribed medications on schedule. Even one missed dose can cause the treatment to fail and have a negative impact on the patient's health. For some patients, a smart medicine box can literally save their lives. Many studies have been conducted in an effort to solve this issue. Given the rapid advancement of technology and the widespread usage of mobile phones, using a smart phone The programmable Smart Medicine Box is an advancement over the conventional medicine box. Reminds patients to take their medications, which can sometimes be a lifesaver. The user can take their medications on schedule thanks to the light and sound reminder. The advanced feature of the smart medicine box is that it will send a message to the user's phone to remind them to take their pills, even if they forget. It's a dual reminder system where the user receives a buzzer reminder for the dosage and a text message on their phone. This approach has a high working efficiency because there is a lower likelihood of a missed dose.

2. Concept And Ideas

Medical reminders operate on the fundamental principle of mobile applications. Since mobile phones are carried by everyone in the present world and these applications can be accessed through them. Throughout this decade, mobile phones have become the most indispensable and easily navigable device. The concept of using a mobile phone as a medication reminder has gained traction as the number of mobile phone users has increased.

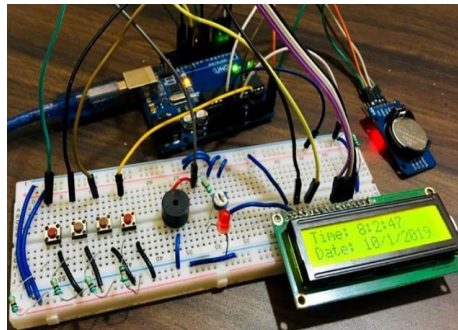


Fig 1: Medicine Reminder using Arduino

Numerous mobile phone reminders have been created and introduced to the market. Examples of medication reminders include the GCM reminder, The Widget application-based medication reminder, the In-House Drug Management System based on RFID technology, and the Sap med application. Medical reminders operate on the fundamental principle of mobile applications. We have read a few study papers about medication reminders that work with smart phones and give people medical support as they take their medications.

Our study is based on the analysis of research papers such as A Mobile Health Application for Outpatients Medication Management [1, 2], Implementation of Cloud Messaging System Based on GCM Service [3], Application of RFID Technology for In-House Drug Management System [4], and Smart Phone Based Medicine In-take Scheduler, Reminder, and Monitor [2]. GCM-based smart phone-based medication reminders[5]. Our Smart Medicine Box's main idea is to assist the user in taking their medication on time by using a buzzer and light.

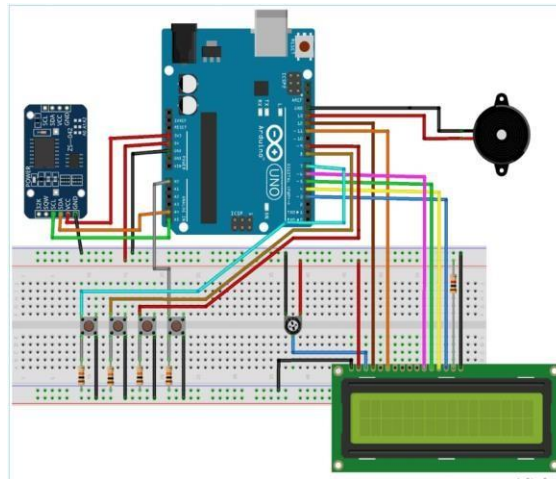


Fig 2: Smart medicine Box Circuit diagram

To minimize errors, the LED will indicate which box the pill should be taken from at that particular moment. Our research on the mentioned articles and research papers prompts us to employ mobile phones in our project, which improves its operational efficiency. To add this

feature, which reminds the user to take his medication, we employed GSM. The message is sent to his mobile phone. The Smart Medicine Box reduces the need for elderly people to rely on others for medical care since it is straightforward to use, efficient in its operation. Its light, sound, and message reduce the possibility of error and lightweight, making it convenient to store and transport. Even those without literacy skills can use this box and benefit from the reminder system with just one trial.

3. Methodology

The 5V supply is used to power the pill reminder alarm. Upon booting up, "Welcome to Circuit Digest" appears as a greeting. Three displays will alternate on the LCD screen by default. "Stay Healthy, Get Well Soon" is how the message appears on the first screen. The second screen is a help screen that instructs you to choose a time slot to be reminded of (once, twice, or three times per day) by pressing the select push button. Program users can modify the time slot and set it up appropriately. We currently have this set for three different times: 8 a.m., 2 p.m., and 8 p.m.

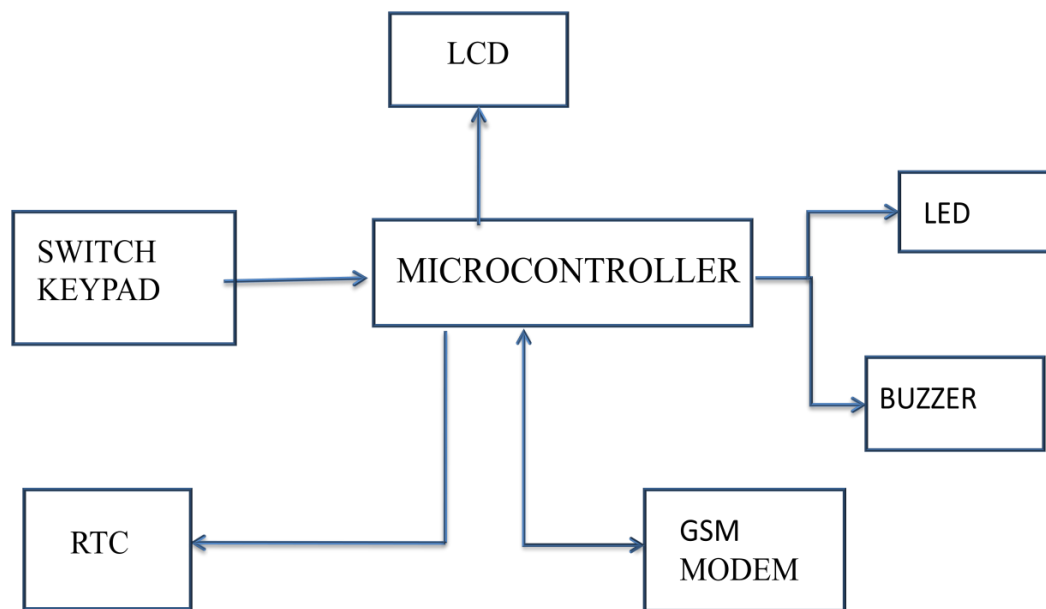


Fig 3: Hardware system block diagram

Three modes have been created from our time slots. When the user clicks the first push button, Mode 1 selects to take medication once day at 8 a.m. When the user clicks the second push button, Mode 2 selects to take medication twice a day at 8 a.m. and 8 p.m. If the user hits the third push button, Mode 3 selects to take the medication three times a day at 8 a.m., 2 p.m., and 8p.m.

A function to snooze the buzzer for ten minutes can also be added (not included in this project). The user's input is captured and the time is deducted from the RTC when they push buttons to pick the appropriate slots. The buzzer will begin to sound when the chosen time slot and the current time coincide. By pushing the STOP button, the user can silence the buzzer.

For the following slot reminder, the same procedure is used. The video provided at the conclusion of this article shows the entire procedure.

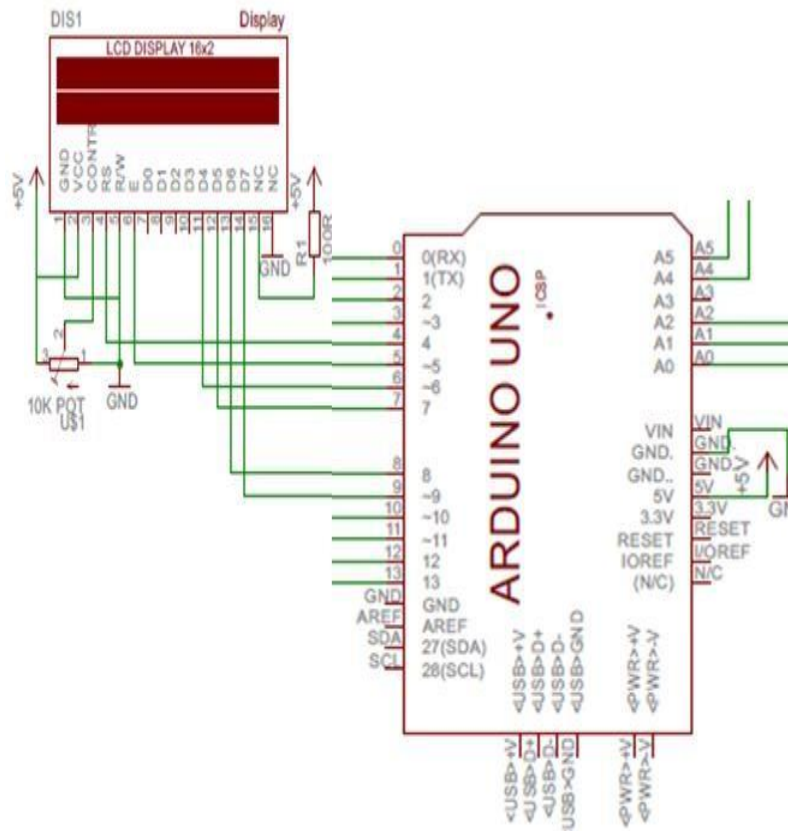


Fig 4: circuit diagram

4. Conclusion

In order to satisfy user needs, we will need to improve our product in a few areas in the future. First, we ought to devise plans and adjust the apparatus in light of the findings of the user assessment. This entails writing an instruction manual, selecting a larger LCD display, adding a loud buzzer, and increasing the quantity of sub-boxes. Our project can be adjusted to allow blind persons to use the system for their medical treatment by utilizing sensors as well. We may add more capabilities to the system by modifying the Arduino programming so that it is compatible with mobile phone applications. If the reminder system calls rather than sends messages, system performance may be improved.

If the reminder could be sent via phone call instead of text message on a smart phone, the smart phone-based medication reminder feature could be improved. There will be a lower likelihood of missing the dose on time thanks to this call-based notice. People receive a ton of messages on their phones every day, and occasionally they would rather ignore them. Call medication reminders are essential in this situation since they force the user to check their phone at the end of the day, which lowers the likelihood that they will miss a dose. If the medication reminder notifies the user to restock on tablets prior to their expiration, it can further enhance its functionality and allow treatment to continue uninterrupted.

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