IoT Driven Smart Pill Box to Remind of Consumption

Nausheen Fatima[1], Praveen Hipparge[2]

[1]Department of ECE, Mtech(VLSI &ES)Sharnbasva University Kalaburagi, Karnataka, India
[2]Professor, Department of ECE, Sharnbasva University Kalaburagi, Karnataka, India

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Abstract - *Smart prescription box used for those clients who normally take drugs and the course of action of their answer be extended as it be difficult to recall to patients what's more designed for their parental figure. In like way Old age patients practice the abhorrent effect of issue of negligence toward get pills on credible time which cause unsure therapeutic issues designed for patients have Permanent sicknesses like diabetes, circulatory strain, breathing issue, heart issues, destructive improvement illnesses, and so forth.*

We saw such kinds of problems in hospitals & people around us who have such kind of diseases and thus based on these problems we made smart medicine box which solve these problems by updating the time table of prescribed medicines through push buttons as given in prescription. Existing time will be saved in RTC module and notification time will be saved in EEPROM. Accordingly at the time of taking medication framework make Notification sound and exhibit the Bright light what's more forewarning through speaker. All pill boxes be pre-stacked inside the structure which patient wants to get at set point in time. Moreover, our structure have superiority that it be capable of perceive whether the patient have taken out pills from the container or not. one more bit of breathing space of our framework combines of Sensing limit if the patient undertakings toward yield the time of removing cure by from the blue opening plus shutting the prescription boxes toward stop the sound.

*Key Words***: Smart medicine box, Old age patients, Permanent diseases, Setting up time table, Bright light, Notification sound, Sensing capability**

1. INTRODUCTION

In everyday life most of the people need to take medicines which was not there in past couple of years and the reason behind this is diseases are increasing in large amount. So early or lately many people come in contact with these diseases. Some diseases are not permanent diseases while many are permanent life threatening diseases. Life comminatory diseases gets mixes with the human body in such a way that they can't leave the body ever and they increases in rapid time. Life span of humans became less because of such diseases and to overcome or to live a better life we need to take medicines regularly and also in large amount. We need to take advice of Doctor who guide us to take desired pills in desired way so that patients face problems like forgetting pills to take at right time and also when Doctor modifies the prescription of medicine patients have to remember the new schedule of medicine. This problem of omitting to take pills at right time, taking wrong medicines and accidentally taking of expired medicine causes health issues of patient and this leads to suffer from unhealthy life.

Our assignment be in the direction of made Arduino-Uno based Smart medicine box which uses Real time clock. The new foreseen component in our undertaking is our system is sensible that patient has taken medication or not and thusly the patient can't defer the time on which he needs to take pills. It is compulsory for the patient to take pills from the compartment at the lucky time commonly our systems continues making colossal sound until the medicine is taken out from the container. This notice part adds life years to the patient and thus this thing isn't available in any device which is the requirement for present days.

1.2 PROBLEM STATEMENT

As pills intake place such an important role in everyday today life there has been the past years an increase in the number of medical neglect cases related to incorrect medication given to patients, such as the case of the nurse who gave a patient a wrong prescription that was not prescribed by the doctor, leading to the patient's health issues or may be death .

Various wrong pills being confirmation through patients be realized by patients themselves, particularly by old developed people, since the senior people needs to take unmistakable prescription at different events. Observing medicine confirmation can transform into a troublesome experience for the status people. This may be a direct result of low vision, memory issues or Logical absence of capacity which make them difficult to recall which pill is to be taken at what time .After watching such countless. It is significant so as to the right capsule be in use by the perfect individual at the opportune time, else it may prompts authentic restorative issues, going from smooth medicinal issues up to death.

1.3 Objectives

The main objective of our project is to solve the above mentioned problems by developing and designing a tool which will helps the owner to track every pill intake in an easy and simple way, which does not required any training or complex learning in order to operate the device. This device will be an intelligent pill box.

1.4 MOTIVATION

Looking in the information we found that the greater part of the passings are caused on the grounds that the patient do not take their drugs in the right amount. They either take overdose of medications thinking or they take under measurement of drugs which prompts a few ineffective wellbeing suggestions. And furthermore a few patients couldn't ready to manage the cost of a Caretaker, so dealing with cost viability. we thought of the plan to make a Pill update which is low on Cost and simple to be dealt with by a normal Intelligent patient.

2. PROPOSED SYSTEM

Smart medicine reminder system be intended used for helping elderly folks individuals in dealing with themselves in taking their prescriptions at the right time and in the right sum. It has been seen that individuals when all is said in done disregard their wellbeing and offer inclination to different thing than taking their medications. This is additionally the reason they neglect to take as much time as is needed.

Many health maintenance organizations, health practitioners and medical researchers have realized that increased use of patient reminders can significantly increase the treatment of chronic illness and delivery of medical services to the patients who need it. However, many patients and especially old people, do not take their medicines in the correct quantity. They either take overdose of medicines thinking it will help them heal faster, or they fear the doctor has prescribed a larger quantity than required and take under dosage of medicines.

The medicine reminder system will have one responsibility and that would be to remind the user that he is due for taking the medicine. We are trying to make sure that the user never forgets to take the medicine and hence we do the reminder in two ways. One is that we have visual indicator which would be the light along with the speaker. We also felt that if a person is not sitting close to pill box he may not notice the lights and does not hear the speaker hence we have also added a buzzer which will give a loud auditory indication that the medicine needs to be taken. In the case if guardian is outside, we have a mobile app which will give details about whether the patient has taken medicine or not for that time. The mobile application can be installed in the android devices. Apart from this we also have Heart beat sensor and temperature sensor which moniters the pulse rate and temperature of the patient.

2.1 BLOCK DIAGRAM

RECEIVER

ANDROID APPLICATION FOR MEDICINE TIME SET
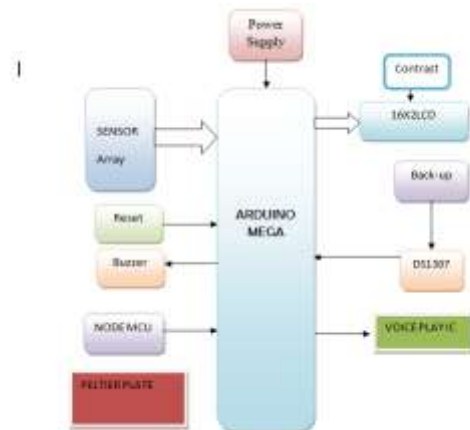
3. WORKING

 This module will take action each time a pill needs to be intake by the patient as it will be the module in charge of reminding of pills. The system will work as normal Digital clock by default. The Real time clock inside the LPC2148 will update the registers. The registers are then loaded to the RAM of the LCD and hence displayed on the Screen.

The Medicine reminder is set for 3 times a day. Based on this individual alarm is set by the same operation. When the time register value equals the Alarm register value, the Buzzer and the LED sends the command for calling the user by blinking of LED and with sound of the buzzer. Then the box will open and message is displayed on the LCD screen as "Time to take pill 1" When the box is opened, a delay timer is set for 1 minutes. The buzzer and LED will remain ON until the patient has taken the pill. As soon as the patient takes the pill the door will close after the delay of few seconds. The result is updated on the mobile application with the color of bar changing to green indicating that the patient has taken the pill.

Similar operation is performed, and if the patient has not taken his pill, the buzzer will sound and LED will blink and mobile application is updated with Red color of the bar indicating that the patient has not taken his pill.

Fig-1 Android mobile application display

The above fig 1 demonstrates the portable application. Here we need to give the data i,e the time with respect to the pill when it is to be taken. at the point when the RTC times match will the Application time then the Buzzer and LED will Turn ON. When the pill is taken the red shading bar will transforms into Green showing that the pill has been taken.

Fig-2 Time for Pill 1   Fig-3 Pill 1 Taken

Fig 2 shows the LCD displaying information about pill i.e "Time to take Box 1 pill" and fig 3 shows that the patient has taken his pill which is indicated by the green color of first bar

Fig-4 Time for Pill 2   Fig-5 Pill 2 Taken

Fig 5 shows the LCD displaying information about pill i.e "Time to take Box 2 pill" and fig 5 shows that the patient has taken his pill which is indicated by the green color of second bar.

Fig-6 Time for Pill 3   Fig-7 Pill 3 Taken

Fig 6 shows the LCD displaying information about pill i.e "Time to take Box 3 pill" and fig 7 shows that the patient has taken his pill which is indicated by the green color of third bar

4. FLOW CHART
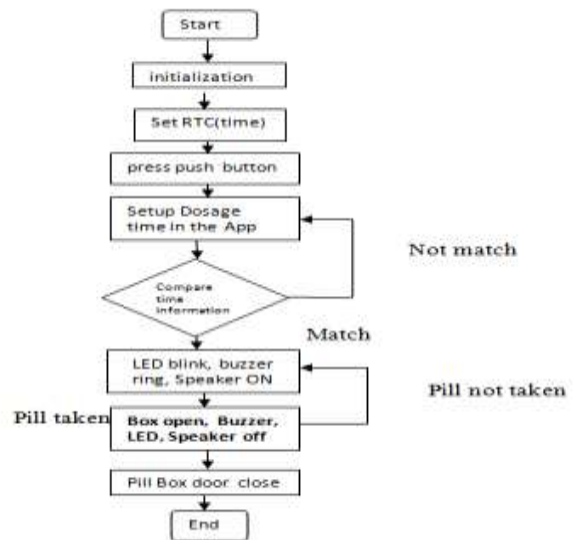
5. ALGORITHM

1. Start step
2. Initialize RTC,LCD
3. Set RTC time
4. Press the push button from Arduino mega
5. Set the dosage time in the mobile application
6. The RTC time is compare with the mobile app time
7. If the time is match LED blinks, buzzer rings and speaker On and pill box is open
8. If the time is not match go to step 6
9. once the pill is taken Buzzer, LED, Speaker turns off
10. if pill not taken go to step 7
11. pill box is closed
12. end

6. APPLICATIONS

- It very well may be a real existence guardian angel at time, as it reminds patient to take prescriptions
- It very well may be utilized as Modern Smart Medical hardware.
- It very well may be utilized in medicinal services offices, for example, Hospitals and drug stores
- It very well may be utilized in homes for maturity individuals

7. ADVANTAGES

- Cost efficient: It is moderate contrast with different items accessible in the market.
- Accurate result: LED squints, Buzzer rings at appropriate time which encourages the patient to take drug at legitimate time.
- It needs less upkeep, it is one time speculation a while later it very well may be utilized continuously.

8. RESULT

Fig-8 Implementation of the Proposed System

The drug update framework serves dependable updates, has a decent and simple to utilize UI and supports a great deal of highlights clinging to medications. The medication update box isn't at all confounding and can be effectively comprehended by the client. The best piece of the application is that the time must be entered just once. On presenting the Time once, the information is matched up; This takes into consideration simple updates and helps the patient in taking his pill effectively.

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