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Smart Medicine Box Using IoT

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ABSTRACT: We have proposed an Smart medicine box. Our medicine box is targeted on users who regularly take drugs or vitamin supplements or nurses who take care of the older or patients. Our main aim is to make a smart medicine box for those users who regularly take medicine and the prescription of their medicine is very long as it is hard to remember to patients and also for their care taker. Also Old age patients suffer from problems of forget to take pills on proper time which causes certain health issues for patients having Permanent diseases like diabetes, blood pressure, breathing problem, heart problems, cancer diseases etc. We saw these problems in hospitals & people around us who have such kind of diseases and thus based on these two problems we made smart medicine box which solve these problems by Setting up time table of prescribed medicines through push buttons as given in prescription. Present time will be saved in RTC module and notification time will be saved in EEPROM. Therefore at the time of taking medicine system will display the Bright light in certain pill boxes. So, patient can know the specific number of box from which he has to take out medicines. All pill boxes are pre-loaded in the system which patient needs to take at given time. And our system has quality that it can sense if the patient had taken out pills from the box or not. The medicine box is programmable that allows nurses or users to specify the pill quantity to take and the serve time for each day.

KEYWORDS: Smart medicine box, Arduino UNO Setting up time table, Bright light, Notification sound, Servo motor, DS1307 RTC.

I. INTRODUCTION

A medicine box has been designed to address a pressing problem faced by the society. The population of older people is increasing rapidly and is people grow older they develop memory difficulties. So older people might forget to take their medications on time Or forget take they have already taken their medications. The design criterion includes low cost, ease of use, reliability and compatibility with different cabinet types. This is programmable this allows users to specific medicine quantity and day to take medicine and serve times for each day. The medicine box will remind users or patient to take medicine using in alarm. The smart medicine box would significantly release nurses or users burden by reminding about the medicine to be consumed.

II. RELATED WORK

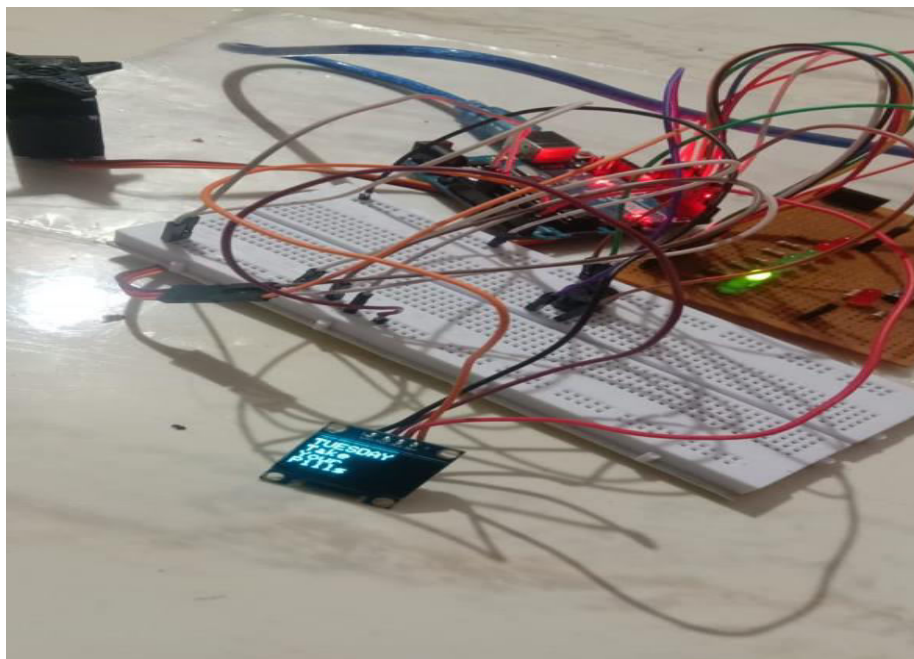
In day-to-day life most of the people need to take medicines which was not there in past couple of years and the reason behind this is diseases are increasing in large amount. So sooner or later many people come in contact with these diseases. Some diseases are temporary diseases while many are permanent life threatening diseases. Life threatening 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 be in advice of Doctor who tells 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 changes the prescription of medicine patients have to remember the new schedule of medicine. This problem of forgetting 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 project is to made Arduino-Uno based Smart medicine box which uses

Real time clock. The new awaited feature in our project is our system is sensible that patient has taken medicine or not and thus the patient can't postpone the time on which he needs to take pills. It is compulsory for the patient to take pills from the box at the right time otherwise our systems continues to make large sound until the medicine is taken out from the box. This notification feature adds life years to the patient and thus this thing is not available in any device which is the necessity for present days.

III. METHODOLOGY

All the components and hardware's like GSM, sensors, LED, Buzzed, servo motor ado used . Program debugging none powerful in this method, an Android based application is used for the patient. Smart medicine box application along with the GSM module of the box makes the medicine box to be accessible form a few distance adapt as well. The application also give the patient notification pried to the dosage alarm. This demands will demand the patient to take medicine competently.

IV. EXPERIMENTAL RESULTS



Working Principle

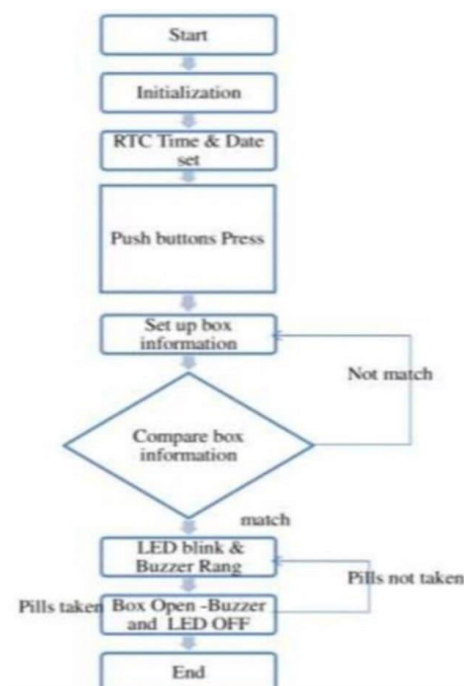
We made schematic in software PROTEUS 8 and will check simulation in it. Firstly we add all part from library of Arduino and RTC module. We also add other part resistors, LED, Buzzer etc. Power supply is applied to the Arduino module. All modules including RTC, Buzzer, LED, etc. are connected with Arduino. We used Arduino Uno in system. RTC is always working whether external power supply is applied to it or not. RTC module contains a 3V CMOS cell. We also connected certain boxes in which user will load the pills. When system gets started time and date will show . Through push buttons we can enter in the menu of setting time of pills prescription. Using another push buttons names increment and next we can set the time of prescription of medicine. At the time we set, buzzer will rang and LED's will blink in the desired box notifying the user to open that box and take out pills from that box in which LED blinks. Buzzer and LED will turn off when user opens the box otherwise buzzer and LED will continuously notify until the time is passed of taking medicine. If the user open and closes the box immediately, system once again starts generating loud sound and forces the user to take pills again. The information of boxes will be stored in structs. For each box, we have a struct to store their

information. The struct contains four variables that indicate which day this medicine should be taken, how many times per day it should be taken, the amount it should be taken each time and a variable that using later by function that control the LEDs to indicate whether the LED of this box should be light up. The real time clock running in our system is implemented by using MCU 16-bits timer to generate 1-second base. Firstly, we will open the compare match interrupt service routine, and set the compare value to 249. Also, we scale the running frequency of timer1 to 1/64. Then, the interval time between each interrupt routine is 0.001 second. We have a volatile variable to run the clock function every 1000 interrupt routines. Then, in the clock function, it will run like a clock. We have separated variable for two digits of seconds, minutes and one variable for hours. We also have a variable for the weekdays. We also store the year information because we think it is necessary.

ALGORITHM

The following algorithms show how the smart medicine box would work

1. Start
2. Initialization
3. RTC Time and Date set
4. Push buttons press
5. Set up box information
6. Compare box information
7. LED blink and Buzzer ring
8. Box open- Buzzer and LED off
9. END





Who Need It?

- Patients that take multiple medicines
- Complex medication schedule
- Brain injury
- Daily task reminder
- Dementia
- Old age people

IV. RESULTS

A prototype of the system was successfully implemented and the device was able to remind the patient when manual entry of data was done. All the specifications of the device are programmable to suit the users requirement making it easy to implement and flexible system.

V. CONCLUSION

The solution of this complication is supplemented by the development of an advanced technology supported medicine box called the Smart pill box. This technology is derived by combining the two vintage experiments from our technical education. The smartness of the pillbox is achieved using cost effective slot sensing techniques like capacitance based slot sensing. These simple efficient techniques are supported by advancements like GSM technology to bridge the gap in communication between the supplier or the chemist and the customer or patient, thus aiding the patient.

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