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# Patient Medication Reminder

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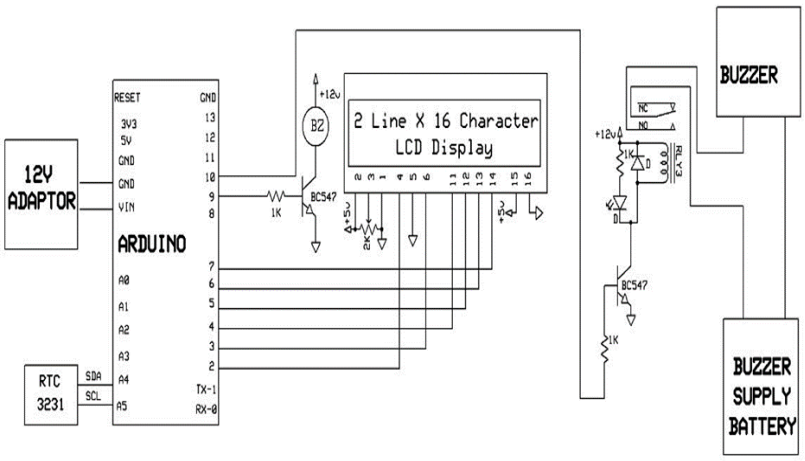
**Abstract:** *Medication management is medical treatment handled by medical therapist that aims to optimize therapeutic outcomes for patients. It is an important topic for treating the elderly who often take multiple medications simultaneously to treat different conditions and symptoms. Medications usually need to be taken in specific doses at set intervals. Missing doses or timing doses incorrectly can cause medical complications. Medication management can include everything from using devices that issue reminders to patients to take their medications to filling pill cases for patients and marking the lid of each compartment to indicate when the contents need to be taken. In this paper, we present a case study of medication reminder system that helps to alert patients who forget to take their medicines at prescribed time. We used HW/SW Co-design approach to allow the hardware and the software of the system designed and implemented in parallel and make sure that the non-functional properties are met.*

**Keywords:** Health system; Medication management; Medication reminder system; HW/SW Co-design; Behaviour driven development

## I. Introduction

While analyzing the project we thought about the importance of the taking medicine on time. There can be a lot of individuals out there who need constant help may it be our elderly people, family members, the ones who have special needs. Elders are more affected by the timing of taking a certain drug than others, in order to prevent any dysfunction or illness timing is a must. We are going to build a Smart medicine Box for Medicine Reminder and Monitoring System. When the pill time has been set, the medicine box will remind clients or patients to take pills utilizing sound and light. For that we use a buzzer & LCD. The name of medicine will display on LED. Our project is to made AVR 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.

## II. Schematic Diagram



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## III. ALGORITHM

1. Start.
2. Raspberry Pi Configuration.
3. GSM Configuration.
4. Extract Time.
5. Check time Range, and here we set the flag for time range. If flag sets at 1 then message will be send otherwise if flag sets at 0 then it will initiated once again and it will go again for time checking.
6. If timer set at within range then text message will be send through GSM module.
7. Also if mobile is Android/smart used then whatsapp message or broadcast message will be sending through Raspberry Pi Module.
8. Stop.

## IV. WORKING

The working of this system is very simple and user-friendly. When the ac mains is switched on, a 12-volt supply is given to the transformer. This voltage is then stepped down to 5 volts and sent to the power supply board. Here, the AC volt is converted to DC using a series of resistors and a rectifier network. The capacitive network then filters the DC voltage; the regulated output is sent finally to the microcontroller board (Semeer Batra, 2015). In the microcontroller board, the AT89S52 microcontroller is pre-embedded with a software program using a Keil compiler. The input of the microcontroller is given from the oscillating crystal 11.0592 via the pins X1, X2(18,19). The entire system is further interfaced to a PC using a MAX 232 port to connect the RS232 cable. A 6 pin cable is used for the interconnection between the LCD and the microcontroller via the pins (22-27). Apart from this, the microcontroller board is embedded with a reset switch. In the microcontroller board, a series of 4 switches and a memory battery are connected to the EEPROM and the DS3231 RTC. Here, the time, date and year along with the entry data for medicines can be given as input to the EEPROM. Now, the RS232 cable is inserted into the RS232 port of the CPU. When this is done, a HyperTerminal window is opened on the monitor. The reset switch has to be turned on at this instant. The monitor then displays a welcome note. The next step is to switch on the "*" (Enter Medicine) switch. When this is pressed, the monitor displays "ENTER MEDICINE" and "TIME." Then, press the "#" key for processing. At the prescribed timings (as prescribed by the doctor/physician) the buzzer gives an alarm, along with the simultaneous display of the name of the medication on the LCD. The alarm can be turned off by pressing the "*" switch once again.

## V. RESULT

When the device is initially powered on, it must be configured through the setup menu. The device has 12 buttons that allow the user to navigate the setup menus. The device is first put into setup mode; this is done by pressing the''*'' button. Once the device is in Setup mode, the user can set the time, and set the time intervals and name of medicine to be taken. This information is then saved to the microcontroller's EEPROM, so configuration only needs to be performed once, even if the device is unplugged temporarily. The device then uses the configuration defined by the user to set up alarms that remind the user to take the appropriate medicine name at the set times. When an alarm is activated, the medicine name is also shown on the LCD screen to set off the alarm; the device counts the time which is input into minutes when the alarm is switch off the device saves that time value. The device then sums the interval specified for the alarm and saves that value as an alarm. For example, if the time is 8 PM and the interval is 2 hours, the device would set the alarm for that particular slot to 10.

## VI. CONCLUSION

Many Medication Reminder Systems have been developed on different platforms. Many of these systems require special hardware devices to remind the patients about the medicine in-take timings. Purchasing new hardware devices becomes costly and more time and money consuming. So in the given work, an attempt has been made to implement a system which will be economical, easily accessible and improves medication adherence. Patient Medication reminder system will reduce the effectiveness of a treatment and imposes a financial burden on healthcare systems. The patients will get the schedule of medicine in-take time with medicine description, starting and ending date of medicine, notification through liquid crystal

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display (LCD), automatic alarm ringing system. The scheduled reminder will suggest the kind of medicine the patient will take at the exact time of the alarm.

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