

## SMART PILLBOX

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**Abstract** - In this day-to-day life most of the people from young age to old age forget to take medicines on time. The elder people also forget to take medicines at particular time. The old age people will always have a big list of prescription of medicines to consume in a day. Hence it is difficult for old age people and also their care takers to remember such sort of list. Due to intake of such a large number of medicines, there may be confusion and also they may consume wrong medicines, which sometimes cause damage to their health. There should be a means to always remind people to take medicines on time. To overcome these problems we made a SMART PILLBOX which reminds people to take medicines at particular times of day. It contains a box with three columns. Therefore, we can set a particular time to each column and fill them with the medicines required. We use RTC module to set time for these columns. So at the time of taking medicine, notification sound such as buzzer and display of light is generated at that particular time. Because of this, the person can know from which box he has to take medicines. This box also has a refilling option, when the box is empty it gives an alert to user to fill the box with red light and buzzer as notifications. Therefore, this smart pillbox helps in reducing the medical errors by helping people to take medicines at particular time.

**Key Words:** Smart PillBox, Led Lights, Buzzer, Sensors, RTC module.

### 1. INTRODUCTION

In this fast running world along with an increase in technology, numerous diseases are increased. Because people don't have time to take care of their health. These kinds of diseases may be temporary or permanent. The temporary kind of diseases can be reduced by taking medicines. The permanent diseases are mixed in with blood, to survive these we need to take medicines at right times regularly. If we neglect or forgot to take medicines, it causes a serious problem for the patient. In these type of diseases people need to take a large number of medicines, this may also cause an intake of wrong medicine. Even the temporary diseases also turn into permanent diseases, if medicines are not taken properly. Therefore, regular intake of medicines is important in both diseases. Hence, we made a SMART PILL BOX to reduce these kind of damages caused to health by wrong intake of medicines. This project is designed to make smart pillbox based on Arduino Uno that uses Real-Time Clock. The patient must take medicines, as the box makes the sound. They cannot postpone their time of taking medicines, once it is set to its proper time. Due to this box it

is not difficult for a person who doesn't remind to take medicines.

### 2. EXISTING SYSTEM

Most of the people forget to take medicines at regular time. As there is a regular increase in diseases, timely medication is important to cure these diseases. As the list of consuming of pills increases, we cannot remember which tablets need to be taken at which time. Not only older people, elder people also have a problem in remembering these many medicines. Which cause in wrong intake of medicines, also damages health of people.

### 3. PROPOSED SYSTEM

There are pillboxes which are used manually, that has boxes with day names present on it. But it doesn't give any notification sound or light. So this box doesn't prevent any type of medical errors. Therefore, we made a smart pill box that is based on Arduino board and uses Real-Time Clock. The Box has three columns and each box has a led. At the particular time the buzzer and led are generated, so that the people get notified and take medicines at that time. This box reduces the responsibility of the family members, as it helps people to take medicines at particular time. We also give another notification after particular time, if we miss the medicine. We also have a refilling option in case of an empty box.

### 4. IMPLEMENTATION

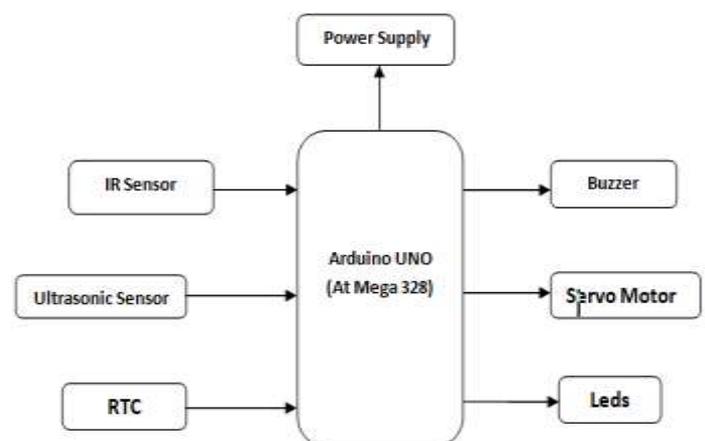


Fig-1: Block Diagram of Smart Pillbox

#### 4.1 Arduino Uno

The Arduino is an ATmega328 based microcontroller module. It has fourteen computerized input/output pins (of which six can be utilized as PWM outputs), six simple sources of info, a USB association and a reset button. It contains everything you need to help the microcontroller; just attach it to a USB device for initialization.



**Fig-2:** Arduino Board

#### 4.2 IR Sensor

An infrared sensor is an electronic device that emits to detect certain aspects of the environment. An IR sensor can measure an object's heat as well as to detect motion. These types of sensors only test infrared radiation, rather than transmitting it, which is called a passive IR sensor. We use this sensor for detecting the person.



**Fig-3:** IR sensor

#### 4.3 Ultrasonic Sensor

An ultrasonic sensor is a sensor that uses ultrasonic sound waves to gauge the distance to an object. An ultrasonic sensor sends and receives ultrasonic pulses which relay information about the proximity of an object. This sensor measures the distance to an object by measuring lapses in time between the ultrasonic waves being sent and received. In our project, this is used to calculate the distance for refilling.



**Fig-4:** Ultrasonic sensor

#### 4.4 RTC Module

The DS3231 RTC module Precise Real-Time Clock Module could even be a low-cost, extremely accurate I2C real-time clock (RTC) with built-in temperature-compensated quartz oscillator (TCXO) and crystal. This system integrates a battery input and ensures reliable timekeeping when the device's main power is disturbed. We use this to calculate the real time.



**Fig-5:** RTC module

#### 4.5 Servo Motor

A servo motor is a tool that can move or rotate an object with great accuracy. When you want to rotate an object at a specific angle or distance, then you use servo motor. It's made of a basic engine running through the servo mechanism. If the motor is used is DC driven then it is called the DC servo motor and if the motor is AC powered it is called the AC servo motor. During a small and lightweight kit, we'll get a really high torque servo motor. The servo motor is used to open the lid at 90° when the individual is identified by an IR sensor.



**Fig-6:** Servo motor

#### 4.6 Buzzer

Buzzer is a mechanical or electromechanical audio-signaling device. We are using buzzer as output device in this project. The buzzer generates at the particular time in order to give an indication to the user to take pills.



**Fig -7:** Buzzer

#### 4.7 LED Lights

The light emitting diode (LED) is a light source with a semiconductor that emits light as the current flows through it. In our project we use the Yellow LED light for the proper indication to open the lid and therefore the Red LED light for the refilling the pills within the box.



**Fig-8:** LED lights

#### 5. CONCLUSION

Many people don't remember to take pills due to their busy life. This paper helps us in an efficient way to take pills at a particular time in order to maintain good health. We made a smart pillbox that is based on Arduino board and uses Real-Time Clock. This Box contains three columns and each box has a led. At the particular time the buzzer and led are generated, so that the people get notified and take medicines at time. Because of this project medical errors of people are reduced and help people to lead a healthy life.

#### ACKNOWLEDGEMENT

We express our sincere gratitude to our guide, Assistant Professor K.Sandeep for suggestions and support during every stage of this work. We also convey our deep sense of gratitude to Dr.S.Suresh, Head of Computer Science and Technology department and our special thanks to the Principal, Dr. Ravi Kadiyala for giving an opportunity to do this project.

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