ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 6, Issue 7, July 2019

# Smart Medicine Box

[1] C.Akshaya, [2]J.Jayasowmiya, [3]P.Kanchana, [4] Dr.J.Raja
[1][2][3] Department Of Electronics And Communication Engineering , Sri Sairam Engineering College,West Tambaram,Chennai.
[4] Professor & Head, Department Of Electronics And Communication Engineering, Sri Sairam Engineering College, West Tambaram,Chennai.

***Abstract* – Most of the people at old age forget to take medicines on time .There should be a means to remind such people to take medicines on time. This project presents a Smart Medicine box to users who regularly take drugs or vitamin supplements, or nurses who take care of the older patients. It would also significantly release the nurses and user's burden on frequently preloading pills for patients users. Our medicine kit has individual compartments that can be filled with medicines and designed in a way to fill medicines when the compartments are empty. When it is time for medication the medicine box drops the pills and sounds an alarm with notification until we take the pills .The setup is interfaced with servo motor and a GSM module to provide notification. The goal of the project is to remind users to take pills regularly and to provide this product at affordable cost. There are several aspects we need to be done in the future to meet the user needs. Firstly, the strategies are to be developed and to modify the device based on the user evaluation results. This includes creating a user manual, choosing a larger LCD display, using a metal or plastic box to cover the entire circuitry and using larger pill boxes.**

**Keywords: Medicine Box, Compartments, Notification, Servo Motor**

## I. INTRODUCTION

With the tremendous growth in medical technology, there is cure for many dreadful diseases through the intake of several new medicines. The number of medicines to be taken by each person has increased. It has become hard for us to remind ourselves to take the medicines at particular time. This Smart Medicine Box helps us in reminding us of the medicine that we should take at that particular time.

## II. PROPOSED SYSTEM

In day together life, People have trouble to remember the pills they need to take from the bag of medicine. Multiple times the problem is the time required to take medicine is not printed on the box of medicine or they couldn't read English. People have also habit to sometimes forget to take pills. Due to this, some medicines were expired. In order to reduce the responsibility of family members the proposed pill box is of great help.

## III. LITERATURE SURVEY

According to World Health Organization, over 80% of the people above the age of 60 years are prescribed medicines that are to be administered 2 - 4 times a day. With the increase in Cardiovascular diseases and Diabetes among the peer group regular medicine administration has become a necessity. But among this another 40-60% is having the issues related to forgetting the taking of medicines at right time. We found several different pillbox products available in the market. The cheapest one was the traditional pillbox, which contained seven boxes for seven different days of a week. Such pillbox normally cost around 200 INR. However, user had to load the pills to the boxes every week. At the time of loading pills in the box, people many time mix their pills with other pills in the same box would increase the risk of making mistakes. Another type of pillbox in the market is also available, which had the sound reminder, and was able to remind the user to take medicine at user specified time but it only remind the user at once a day. The costs of this type of pillbox were so high about 1000 INR, Therefore, we think it was necessary to build a cheap and functional smart Medicine box that could bring more convenience for the user

## IV. COMPONENTS USED IN SMART MEDICINE BOX

**Arduino Uno**

The Arduino Uno is a microcontroller board based on the ATmega328 It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.The Uno differs from

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 6, Issue 7, July 2019

all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.the Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier and the board has the following new features:-1.0 pinout: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V.


**Fig:1 Arduino UNO**

**IR Obstacle Detector**

This is a multipurpose infrared sensor which can be used for obstacle sensing, color detection fire detection, line sensing, etc and also as an encoder sensor. The sensor provides a digital and an analog output. The sensor outputs a logic one(+5V) at the digital output when an object is placed in front of the sensor and a logic zero(0V), when there is no object in front of the sensor. An onboard LED is used to indicate the presence of an object. The sensor outputs an analog voltage between 0V and 5V, corresponding the distance between the sensor and the object at the analog output.

**GSM Module**

The GSM makes use of narrowband Time Division Multiple Access (TDMA) technique for transmitting signals. The GSM was developed using digital technology. It has an ability to carry 64 kbps to 120 Mbps of data rates.A GSM digitizes and compresses data, then sends it down through a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band.The GSM network authenticates the identity of the subscriber through the use of a challenge-response mechanism. A 128-bit random number (RAND) is sent to the MS. The MS computes the 32-bit signed response (SRES) based on the encryption of the random number (RAND) with the authentication algorithm (A3) using the individual subscriber authentication key (Ki). Upon receiving the signed response (SRES) from the subscriber, the GSM network repeats the calculation to verify the identity of the subscriber.

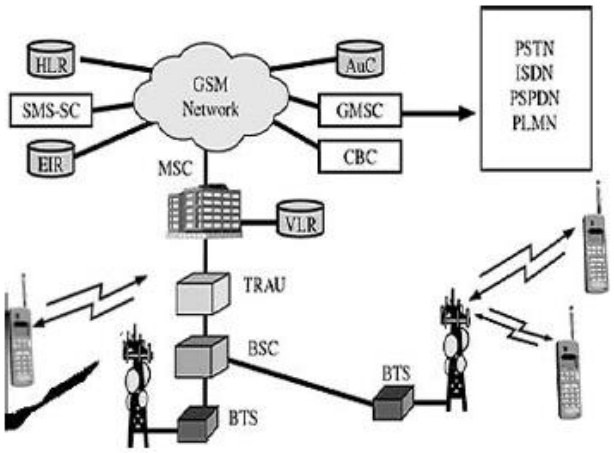


**Fig 2: GSM Architecture**

**LCD Display**

This section describes the operation modes of LCDs, then describes how to program and interface an LCD to PIC Microcontroller.In recent years the LCD is finding widespread use replacing LEDs (seven-segment LEDs or other multi segment LEDs). This is due to the following reasons such as the declining prices of LCDs,The ability to display numbers, characters, and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU (or in some other way) to keep displaying the data.Ease of programming for characters and graphics.The LCD discussed in this section has 14 pins. The function of each pin is given in the table below.While V CC and V SS provide +5V and ground, respectively, V EE is used for controlling LCD contrast.There are two very important registers inside the LCD. The RS pin is used for their selection as follows. If RS=0, the instruction command code register is selected, allowing the user to send a command such as clear display, cursor at home, etc. If RS=1 the data register is selected, allowing the user to send data to be displayed on the LCD.

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 6, Issue 7, July 2019

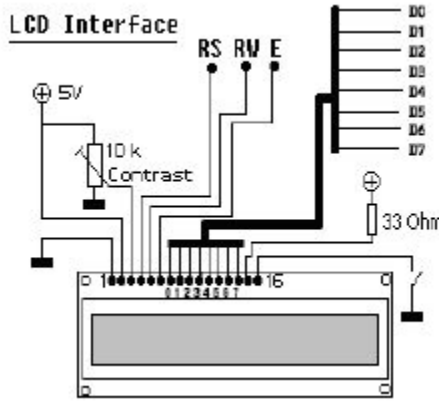


**Fig 3.LCD Interface Diagram**

**BUZZER**

A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven , or game shows .It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound . Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise). Often these units were anchored to a wall or ceiling and used the ceiling or wall as a sounding board.

**Servomotor**

SG90 9 g is a Micro Servo Tiny and lightweight with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.Its specifications areWeight: 9 g ,Dimension: 22.2 x 11.8 x 31 mm approx.,Stall torque: 1.8 kgf·cm Operating speed: 0.1 s/60 degree ,Operating voltage: 4.8 V (~5V) ,Dead band width: 10 µs ,Temperature range: 0 ºC – 55 ºC .

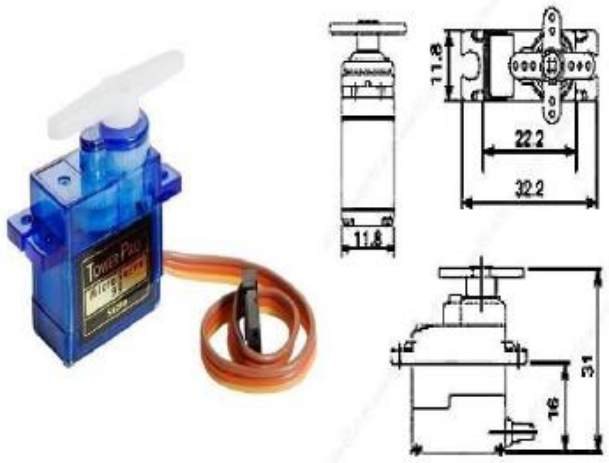


**Fig 4:Servomotor.**

## V.DESCRIPTION

As we switch on our device, the current time and date that is stored and is displayed on LCD. A speaker module is connected to the ATMEGA 328.The alarm time is compared to the current time by the microcontroller and when they match, an interrupt is generated. Then the LED on the pillbox glows and a alarm is also generated indicating which pill should be taken.The sensor output is multiplexed to the controller board via the multiplexer IC. the selector lines receive inputs from the microcontroller.The microcontroller is interfaced with two output modules.The LCD module for display operations and Buzzer for alarm function. Additional switches and push buttons are connected as inputs to adjust the register values.The GSM module is connected via the UART.The GSM module (SIM300) is interfaced to the controller for sending messages to the patient as an alert system. The numbers to be accessed by the GSM is read from the microcontroller's memory.

## VI.RESULT

The result of the project is useful for those people who are taking pills regularly, prescription of medicine is very long and hard to remember for those users.

## VII.FUTURE SCOPE

There are several aspects we need to work on our device in the future to meet the user needs. Firstly, we should develop strategies and modify the device based on the user's evaluation results. This includes creating a user

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 6, Issue 7, July 2019

manual, choosing a large LCD display, using the metal or plastic box cover the entire circuitry placing switch and LCD display on the surface of the box and using the pill boxes. We can also use this sort of implementation, not only in medical applications, but also in industrial and automotive applications where time management is critical.

## VIII. CONCLUSION

There is a great need for timely intake of medicines which is often skipped by many people. This Smart Pill Box helps to remind us to take medicines regularly and also which on time. Thus this implementation, though small and simple, will be a very great and useful step in the field of medicine.This paper has focused on the problems faced by senior citizens concerning adherence to their prescribed medication. It not only aids the elderly who live independently but also the caretakers of the elderly by reminding right amount of medicine at the right time. The smart medicine box has been experimentally proven to work satisfactorily. This medicine box which is a sort of semi-automatic is not only useful for geriatrics but instead it is can prove useful and a user friendly tool for all of us. It provides a greater efficiency to our paper. It helps it to be cost efficient also. The other advantage of this box is that it is very easy to use and the complexity is less.

## IX.ACKNOWLEDGEMENT

We are thankful to DrJ.Raja, HOD Dept. of Electronics and Communication, Sri Sairam Engineering College, Chennai to provide us guidance and encouragement to carrying out this paper work.

## X.REFERENCES

[1].Smart Medication Dispenser: Design, Architecture and Implementation- Pei-Hsuan Tsai, Tsung-Yen Chen, Chi-Ren Yu, Chi-Sheng Shih, Member, IEEE, and Jane W. S. Liu, Fellow, IEEE.

[2].Smart Medication Dispenser: Design, Architecture and Implementation- Pei-Hsuan Tsai, Tsung-Yen Chen, Chi-Ren Yu, Chi Sheng Shih, Member, IEEE, and Jane W. S. Liu, Fellow,IEEE.

[3] "An Electronic Pillbox for Continuous Monitoring of Medication Adherence",Tamara. L.Hayes, Member,IEEE, John M. Hunt, Member IEEE,28th IEEE EMBS Annual International Conference New York City, USA, Aug 30-Sept 3, 2006..

[4] Naga Udayini Nyapathi 1, Bhargavi Pendlimarri 2, Karishma Sk3 , Kavya Ch4," Smart Medicine Box using ARM7 Microcontroller", International Research Journal of Engineering and Technology(IRJET) , Volume: 03 Issue: 05 | May-2016.

[5] Viral Shah, Jigar Shah, Nilesh Singhal, Harsh Shah & Prof. Prashant "Smart Medicine Box", Imperial Journal of Interdisciplinary Research (IJIR), Vol-2, Issue-5 ,2016.