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# Automatic Drug Dispenser

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***Abstract:** In today's hectic day, taking medicines intime is challenge in everyday life. prescribed drug dosage schedule must be followed strictly. person have to take medicine safely and effectively. and automatic drug dispenser is important tool for the caregivers who have to manage the medicine schedule different times during the day for their loved once and also it will notify if patients does not take medicine.*
*This tool is giving multiple medicine at different times during the day. there is lower possibility that medication error, take their medicines correctly on time, and that buzzer reminds them to take the medicine. our project is made for reduce the risk, reduce human errors, helps elderly and disabled patients. medicine dispenser improve lower healthcare cost in today's society. it play most important role in improving patient health.*

## I. INTRUDUCTION

A medicine dispenser is a device that automatically delivers the prescribed or pre-set medication to the patient at scheduled time.it enhance compliance with prescribed medication.it usually includes features like medicine schedules, alerts for medicines and if they don't take medicine it will notify the caregivers.

The device helps patients take their medicines correct time, prescribed one, safely, improve patients health, make them more satisfied with this device and reduce the cost, making it an important device for health care. the automatic drug dispenser delivers the predetermined medicine into a compartment at scheduled time, caregivers manually make this schedule and it will notify the patients when it's time to take the medicine. typically it sounds a loud buzzer to remind patient and if the medicine not taken on time it will generate a notification to the caregivers.

The goal of this project is to build a medical dispenser with modern functions that helps to take medicine accurately and effectively. the device is user friendly and focus on accessibility. lower healthcare costs and improve patients health by ensuring medicines are taken correctly and reduce the risks.

Offering an easy-to-use and trustworthy medication management system, we aim to help patients take control over their treatment and improving their healthcare experience.

## II. LITERATURE SURVEY

[1] Designed an intelligent medicine dispenser with motion detection and missed-dose handling to enhance patient safety. Nigade et al. [2] Developed an automated medication dispenser with an alert mechanism to ensure timely reminders and reduce human dependency. [3], Focusing on reliable medication management. [4] Introduced a smart pill box healthcare system aimed at improving patient compliance through scheduled alerts.

## III. SYSTEM ARCHITECTURE

In the block diagram, the system includes Arduino, RTC, LCD display, DC power supply, buzzer, keypad, Wi-Fi module, motor, and the medicine dispenser. Arduino works as the main controller of the system. The RTC keeps track of the current time and sends it to the Arduino, while the LCD shows the time and other information to the user. Using the keypad, we can set different medicine timings.

When the real time matches the set time, the Arduino turns on the buzzer to remind the user. Once the user presses the button, the buzzer stops and the required pill is dispensed. The system works using a power supply, and the RTC has its own small battery so it continues to keep time even if the power goes off.

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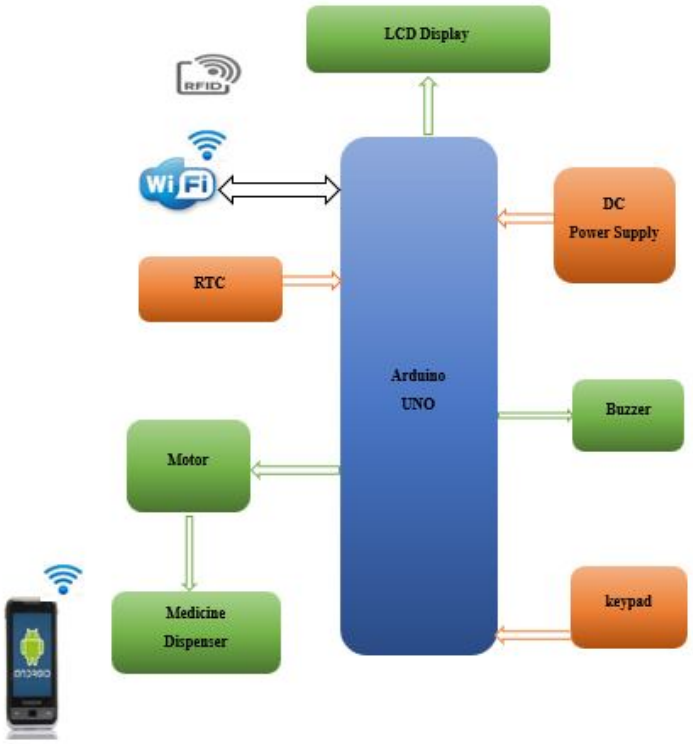



Fig 1 : Block Diagram

## IV. COMPONENTS

*1) Arduino UNO*

Arduino Uno is a widely used microcontroller development board based on the ATmega328P. It operates at 5V with a clock speed of 16 MHz. The board has 14 digital I/O pins (6 PWM) and 6 analog input pins, making it suitable for connecting sensors and output devices. It can be programmed using the Arduino IDE through a USB cable and can also be powered by an external power supply. Important features include a USB interface, reset button, voltage regulator, and crystal oscillator. Due to its simplicity, low cost, and strong community support, Arduino Uno is widely used in electronics.




Fig 2 : Arudino Uno

*2) RTC DS3231*

The DS3231 is a highly accurate real-time clock (RTC) module used to keep track of time and date continuously. It communicates with the microcontroller using the I2C interface and stores information such as seconds, minutes, hours, day, date, month, and year. The DS3231 has an in-built crystal oscillator and temperature compensation, which makes it more accurate than other RTC modules. It also has a battery backup, so it continues to keep time even when the main power is switched off. This module automatically adjusts the number of days in each month .

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Fig 3 : RTC

*3) LCD Display*

An LCD (Liquid Crystal Display) is a flat display screen that works using liquid crystals placed between two glass layers. When electricity is applied, these crystals change their light passing properties and form characters or images on the screen. LCDs are thin, lightweight, and use less power compared to old CRT displays. Because of these advantages, LCDs are commonly used in calculators, watches, mobile phones, laptops, and many electronic projects to display information.




Fig 4 : LCD

*4) DC Power Supply*

A DC power supply is used to convert the 230V AC from the mains into a safe DC voltage needed for electronic circuits. First, the 230V AC is stepped down to a lower AC voltage using a transformer. Then this AC is converted into DC using a bridge rectifier circuit. After rectification, a filter is used to remove ripples and make the DC smoother. Finally, a voltage regulator is used to get a constant 5V DC output, which can safely power devices like Arduino, sensors, and other electronic components

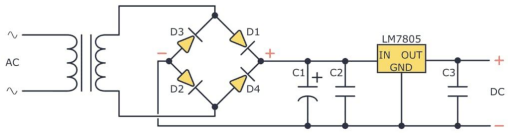



Fig 5 : power supply

*5) Buzzer*

A buzzer is an electronic sound device used to produce alert or warning sounds to a user. It works by converting electrical signals into sound and usually operates on DC supply. Buzzers are commonly used in alarms, timers, computers, printers, and various electronic projects.



Fig 6 : Buzzer

*6) Keypad*

In our automatic drug dispenser project, we use a 1×4 keypad as the input device. It consists of four push buttons arranged in a single row. This keypad is used to set and adjust functions such as medicine time, schedule selection. When a button is pressed, it sends a signal to the microcontroller to perform the required operation.

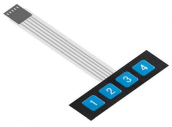



Fig 7 : Keypad

*7) Wi-fi ESP8266*

The ESP8266 is a low-cost Wi-Fi module used to connect electronic devices to the internet. It allows a microcontroller to send and receive data wirelessly through Wi-Fi. The module supports standard TCP/IP communication and can easily connect to a Wi-Fi network.

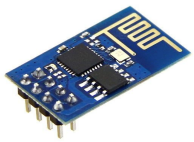


Fig 9 : WIFI

*8) Servo Motor*

A servo motor is a special type of motor that can rotate to a specific angle with high accuracy. It has a motor along with a position sensor, so it always knows how much it has turned.



Fig 10 : Servo motor

## V. WORKING

The automatic drug dispenser works by storing medicines in different compartments and supplying them to the user at the correct time . The system mainly uses an Arduino as the brain of the system, along with an RTC (Real Time Clock) module that continuously keeps track of the current time. The user sets the required medicine timings using the keypad, and these timings are displayed on the LCD screen. Once the set time and the current time match, the Arduino sends a signal to the servomotor to rotate the dispenser and release the appropriate medicine dose into the output slot. At the same time, a buzzer starts ringing to alert the patient that it is time to take the medicine, and in advanced systems, Wi-Fi can also send a notification to caretakers . This system helps patients, especially elderly people or those with busy schedules, to take their medicines correctly and on time, reducing the chances of missing doses and improving medication management

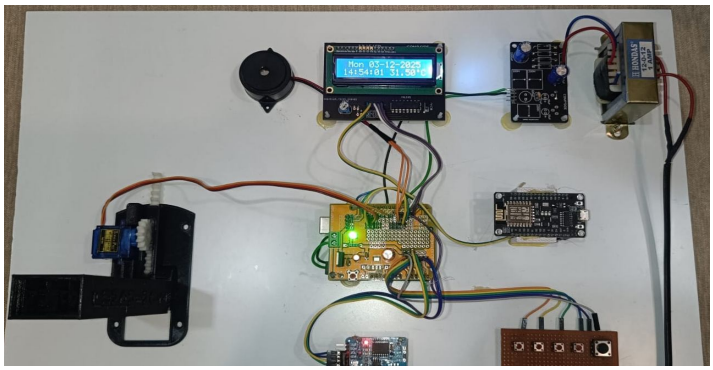


Fig 11 : Automatic Drug Dispenser

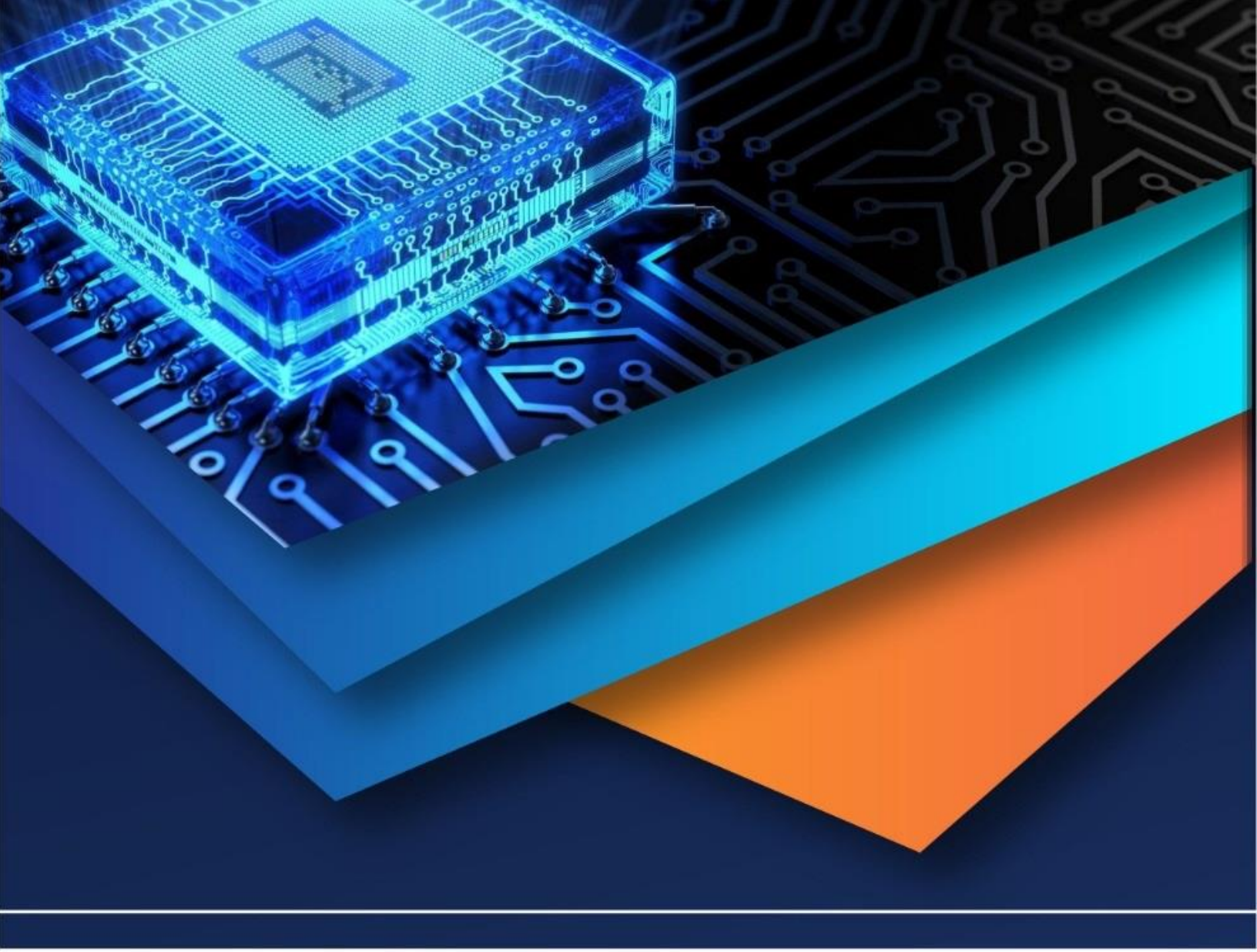
## VI. CONCLUSION

The project goal is to give practical and efficient medication management by using Automatic drug Dispenser, it supports patients and caregivers. Pill dispenser helps patients to take the correct medicine at right time, and patients take their medicines regularly and on time. it reduces the chances of incorrect or missed medicines. Patients follow their treatment correctly and improve their health. it specially useful for the chronic illnesses people and who take multiple medicines. it enhance patient safety, By programming the dispenser release medicines at a fixed times, avoided overdosing, in addition it is remove the human errors.

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