



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 4, April 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.379



9940 572 462



6381 907 438



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IOT-Based Automatic Medicine Dispenser

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ABSTRACT: The IoT Medicine Dispenser with ESP32 is an innovative healthcare solution designed to address the challenge of medication adherence among patients. Medication non-adherence is a widespread issue, leading to suboptimal treatment outcomes and increased healthcare costs. This project leverages the capabilities of the ESP32 microcontroller and IoT technology to create a smart medication dispenser that helps patients take their medications on time and in the correct dosage.

KEYWORDS: IOT, Medicine Dispenser, ESP32, Internet of things

I. INTRODUCTION

In an era marked by the convergence of healthcare and cutting-edge technology, the IoT Medicine Dispenser with ESP32 emerges as a beacon of innovation, revolutionizing how patients manage their medication regimens. The Internet of Things (IoT) is a network of physical objects that are embedded with sensors, software, and network connectivity to enable them to collect and exchange data.

An automatic medicine dispenser is a device that dispenses medication at predetermined times. The core features of this IoT Medicine Dispenser include: Automated Medication Dispensing system stores various medications and dispenses them at scheduled times. It ensures accurate dosage delivery, reducing the risk of human error. IoT Connectivity, Patients & caregivers can control and monitor the dispenser remotely through a dedicated mobile app. The dispenser sends notifications to users' smartphones to remind them to take their medication. It can also notify caregivers or healthcare professionals in case of missed doses.

II. LITERATURE SURVEY

In [1] authors proposed a smart medical box that dispenses medicine, basic health monitoring system for the patient's temperature, oxygen level, and heartrate detection. This device is Raspberry Pi-controlled, having an added security feature of biometric recognition so that the medicine is dispensed to the correct patient. User is notified once their medicine has been dispensed via SMS.

In [2] authors designed and implemented a medical dispenser using IoT, that will assist elder or blind individuals with taking their medications on time as well as monitoring them continuously. An Arduino application is provided to the user to set the alarm for the patient's medication, which is connected to the dispenser as a Bluetooth. The dispenser contains compartments to store pills. The dispenser will alert senior citizens with an LCD and speaker, ultimately dispensing the pills. In addition, a live stream video is also available to monitor the patient's actions.

In [3] authors proposed a Automatic medication dispensers for people who take prescription medications unsupervised by medical professionals. It frees the user from the risky duty of giving the incorrect drug at the incorrect time. Geriatrics rely on their medications to keep them healthy; they are more likely to make mistakes like forgetting to take a dose. Thus, a device for distributing medications developed to help elderly people take their medications on time. The following components are used Buzzer, ESP CAM 32, L293D (Motor Driver), DC motor, 3pillcontainers, GSM.

In [4] authors proposed Automatic pills dispenser box dispenses medicines on required time with notifying the caretaker person. It is a device which provides medicines on time. Automatic dispenser has separate compartments for each pill which can be dispensed at required time with requirement number of each pill. IOT is used, Microcontroller is

the main part of the device which controls various functions and operations of the device. The servomotors and stepper motors are controlled by the microcontroller through the motor controller.

In [5] authors proposed an Automatic Medicine Dispenser that is reliable, affordable. This product is designed for timing of the pills to be dispensed which can be controlled and monitored using an app, which makes things easier for everyone, including for children who work abroad. Also, it offers clear contact between the consumer and parental figures as it will notify the guardian in case the patient has missed pill intake. SMD provides the customer with a touchscreen that can be accessed as an application on their cell phone, enabling them to monitor and control.

In [6] authors present a system consisting of a smart medicine dispenser. The main idea solution to help people to avoid incorrect medication intakes. The smart dispenser delivers the required medication if it is the scheduled time for a medication intake, and the person who removes the medication from the dispenser can be identified. Person identification and authorization is performed through facial recognition by the dispenser and through a username and a password by the mobile application. The system reminds the users whenever a medication intake should take place through mobile notifications and lights and sounds emitted by the dispenser.

III. PROPOSED METHODOLOGY

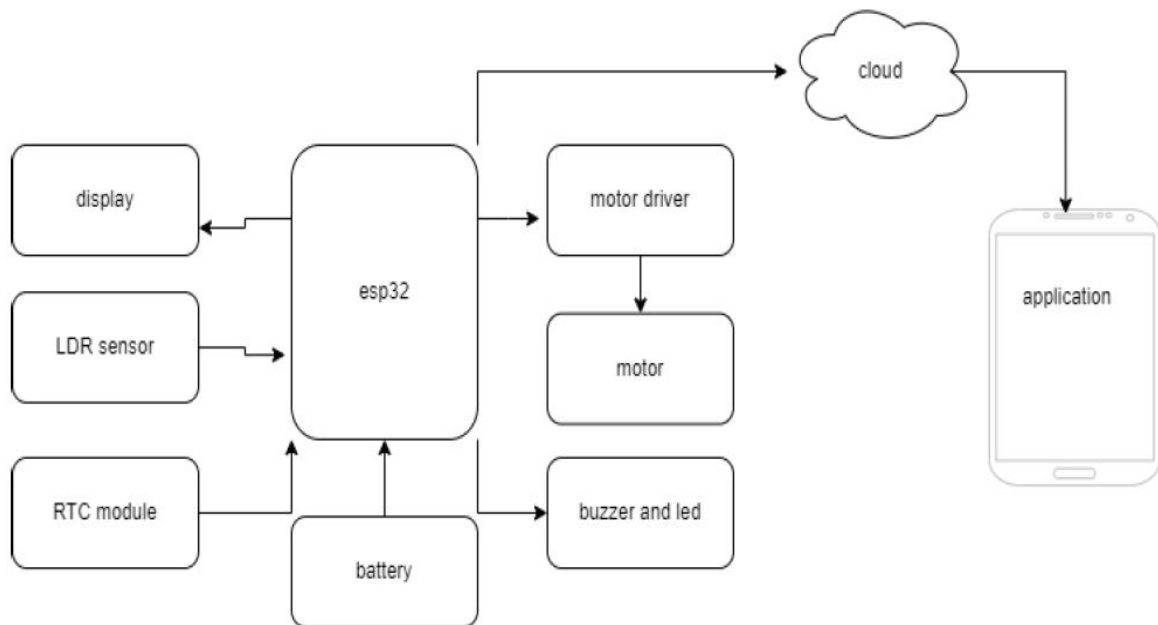


Fig 1: Block Diagram of IOT-Based Automatic Medicine Dispenser

An automatic medicine dispenser using the Internet of Things (IoT) with an alert system is controlled by an ESP32 microcontroller, which uses an RTC module to keep track of time and dispense medication at the scheduled time. If it is time to dispense medication, the microcontroller activates the dispensing mechanism. Servo and stepper motors are used to rotate the medicine carousel and dispense the correct amount of medication. An LDR sensor is used to detect if the medication has been taken. If the medication is not taken, the system sends an alert to the patient's caregiver using the Blynk application. The system is powered by a battery, making it portable and convenient for use. An LCD display shows the patient the name of the medication, the dosage, and the scheduled time. A switch is used to turn the system on and off.

IV. FLOW DIAGRAM

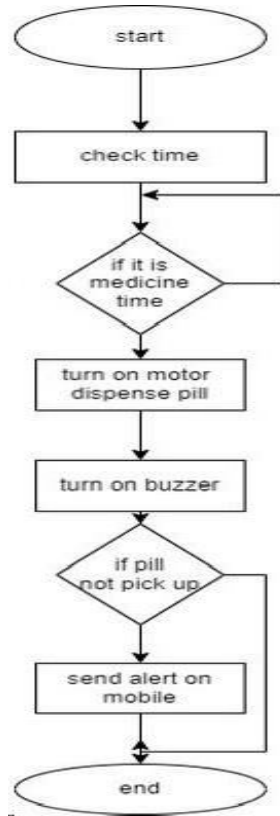


Fig. 2 Working Flow of IOT-Based Automatic Medicine Dispenser

V. RESULT

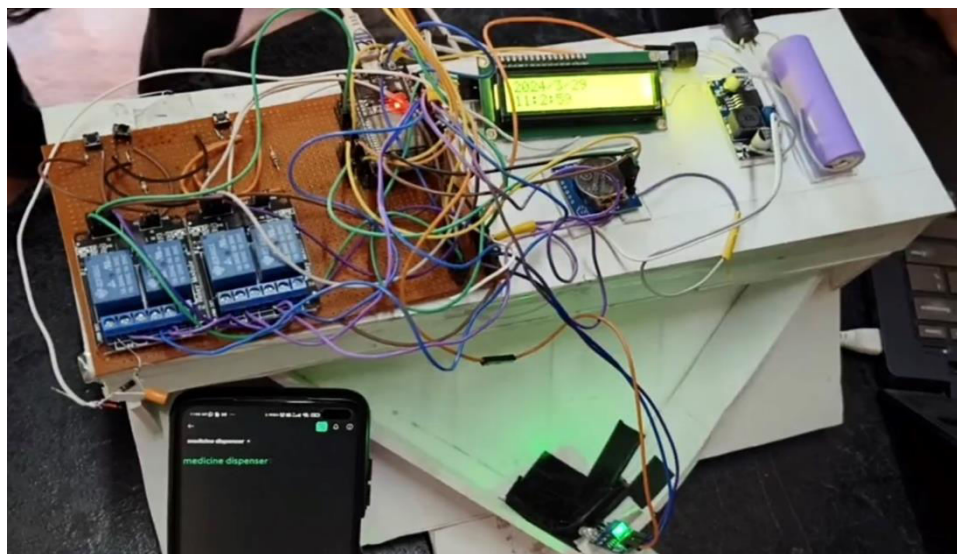


Fig 3. Upper view of IOT-Based Medicine Dispenser

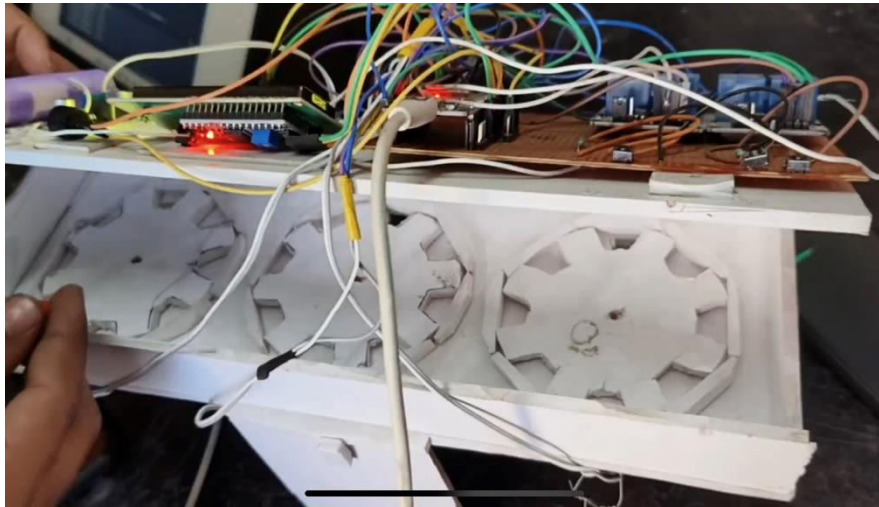


Fig. 4 Inner Medicine Dispensing View of IOT-Based Automatic Medicine Dispenser

VI. CONCLUSION

After exploring various technologies in the field of robotics and IoT, we can conclude that an IoT-based medicine dispenser using ESP32 represents a notable advancement in healthcare technology. By seamlessly integrating IoT capabilities with the ESP32's robust functionality, it provides a comprehensive solution to medication management challenges. With its precision in dispensing medications, real-time monitoring capabilities, and remote access for caregivers and healthcare providers, this device not only improves patient adherence but also ensures their safety and well-being. Looking ahead in healthcare, the IoT-based medicine dispenser using ESP32 has the potential to reduce medication errors, decrease healthcare expenses, and enhance overall patient outcomes. It demonstrates the transformative power of technology in healthcare delivery, making it more efficient, patient-focused, and accessible. With ongoing advancements and enhancements, this innovation holds the promise of significantly impacting the lives of individuals managing chronic illnesses and those requiring complex medication regimens. In the years to come, we can expect further progress in this field, contributing to a healthier and more interconnected healthcare landscape.

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