

# IoT-Based Automatic Medicine Dispenser : A Review

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## Abstract

In this paper, 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.

**Keyword:-** IOT, Medicine Dispenser, ESP32, Internet of things.

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## 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 Review

Design of a Smart Medical Box for Automatic Pill Dispensing and Health Monitoring [1] They proposed a smart medical box that dispenses medicine, basic health monitoring system for the patient's temperature, oxygen level, and heart rate 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.

Live Streaming Smart Pill Dispenser to Help Elderly/Blind People [2] was 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.

Medicine Pill dispenser and surveillance [3] This paper 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, 3 pill containers, GSM.

Automatic pill dispenser box with time alert [4] This paper proposed a 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.

Automatic Medicine Dispenser using IoT [5] This paper is 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.

IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake [6]. This paper presents 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. Research Methodology COMPARISON BETWEEN EXISTING TECHNOLOGIES

S.no	Existing Work	Components Used	Advantages	Scope of Improvement
1	Design of a Smart Medical Box for Automatic Pill Dispensing and Health Monitoring.	Raspberry Pi-controller, Buzzer, Sensors, GSM module	.Medication adherence, Customization	Improve the accuracy of medication management by incorporating features like barcode scanning
2	Live Streaming Smart Pill Dispenser to Help Elderly/Blind People	Arduino, Stepper motor, LCD	.It is user friendly and Reliable live streaming smart pill dispensers prioritize patient privacy and data security,	Provide detailed medication information, including dosage instructions, side effects during live streaming
3	Medicine Pill dispenser and surveillance	ESP CAM 32, L293D (Motor Driver),DC motor	light weight and easy to operate	Implement two-way audio communication to allow users to interact with caretakers.
4	Automated Medicine Dispenser with Personal Healthcare Monitoring using IOT	.Bluetooth, IoT technology	improve medication management	Develop algorithms that create personalized care plans based on a user's health data
5	Automatic pill dispenser box with time alert	IoT-technology, Microcontroller, servomotors	Timely reminders	Enhance the alert system to provide customizable reminders for each medication dose.
6	Automatic Medicine Dispenser using IoT	Arduino uno, RTC module, ESP8266	.Better Accuracy	Ensure robust data security and privacy measures to protect sensitive medication information.
7	IoT-Based Smart Medicine Dispenser to Control and Supervise Medication Intake	Arduino Uno, Raspberry pi 3	Reduced medication Errors	Improve the precision and reliability of medication dispensing to ensure accurate dosing.

*Table 1*

### IV. Conclusions

After going through different technology in the field of robotics and IOT. We can say that IoT- based medicine dispenser using ESP32 represents a remarkable stride in healthcare technology. By seamlessly integrating IoT capabilities with the ESP32's robust functionality, it offers a multifaceted solution to medication management challenges. With its ability to dispense medications accurately, provide real-time monitoring, and facilitate remote access for caregivers and healthcare providers, this device not only enhances patient adherence but also ensures their safety and well-being. As we look to the future of healthcare, the IoT- based medicine dispenser using ESP32 embodies the potential to reduce medication errors, lower healthcare costs, and improve overall patient outcomes. It serves as a testament to the power of technology to transform and elevate healthcare delivery, making it more efficient, patient-centric, and accessible. With ongoing advancements and refinements, this innovation holds the promise to significantly impact the lives of individuals managing chronic illnesses and those in need of complex medication regimens. In the coming years, we can anticipate further developments in this field, contributing to a healthier and more connected world of healthcare.

### References

- [1]. Zara Nasir , Amina Asif , Muhammad Nawaz And Muhammad Ali “Design Of A Smart Medical Box For Automatic Pill Dispensing And Health Monitoring”, (2023).
- [2]. Sri Lakshmi Ullankala, Harshavardhan Raju Buddaraju, Ashritha Meegada, Santosh Kumar Tallapalli “ Live Streaming Smart Pill Dispenser To Help Elderly/Blind People”, (2023)
- [3]. Namrata Singh, Sakshi Mahajan, Gauri Salgar, Balika Tawade “Medicine Pill Dispenser And Surveillance”, (2023)
- [4]. Kajal Shahane, Rishabh Deshmukh, Prajwal Dange, Shailesh Birthariya “Automatic Pill Dispenser Box With Time Alert” (2021)