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# Smart Medicine Announcement and Dispenser System

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**ABSTRACT:** The "Smart Medicine Announcement and Dispenser System" is an innovative solution designed to enhance medication adherence, particularly among the elderly and individuals with chronic health conditions. By integrating Internet of Things (IoT) technologies, the system automates the scheduling, dispensing, and monitoring of medications, thereby minimizing human error and ensuring timely intake. The system comprises a microcontroller (such as Arduino or ESP32) connected to a Real-Time Clock (RTC) module, servo motors, and a user-friendly interface. Medications are organized into compartments corresponding to specific times of the day—morning, afternoon, and night. At predetermined times; the RTC triggers the microcontroller to activate the appropriate servo motor, dispensing the correct dosage. Simultaneously, auditory alerts and visual cues notify the user, ensuring awareness. If the medication is not retrieved within a set timeframe, the system sends notifications to caregivers via a connected mobile application, facilitating remote monitoring and intervention.

## I. INTRODUCTION

The advent of the Internet of Things (IoT) has revolutionized healthcare by introducing smart solutions that automate and streamline various processes. One such innovation is the Smart Medicine Announcement and Dispenser System, which integrates IoT technologies to provide an automated, reliable, and user-friendly approach to medication management. This system is designed to dispense prescribed medications at predetermined times, accompanied by audible and visual alerts to notify users. By incorporating components like microcontrollers, real-time clocks, and connectivity modules, the dispenser ensures that patients receive the correct dosage at the right time. Moreover, the system can be configured to send notifications to caregivers or healthcare providers if a dose is missed, facilitating remote monitoring and timely interventions.

## II. LITERATURE REVIEW

**Automated Dispensing with Alerts:** Modern dispensers use microcontrollers to release the correct medication dose at scheduled times. They often include alarms or notifications to alert users, ensuring timely intake. Some systems also notify caregivers if a dose is missed. **Integration with Mobile Applications:** Many smart dispensers connect to mobile apps, allowing caregivers to monitor medication schedules and adherence remotely. This integration enhances communication and ensures better management of the patient's medication regimen.

**Biometric Verification:** To ensure the right person receives the medication, some dispensers incorporate biometric systems like fingerprint recognition. This adds a layer of security and personalization to the dispensing process. **Health Monitoring Features:** Advanced dispensers not only manage medications but also monitor vital signs such as heart rate and oxygen levels, providing a comprehensive health management.

## III. METHODOLOGY

- 1. Problem Identification
- Many people forget to take their medicines on time, especially the elderly and chronically ill.
- Manual tracking can lead to missed or wrong doses, affecting health.
- 2. System Design
- The system is designed to automatically dispense medicines at the correct time and announce reminders using a buzzer, speaker, or display.
- It also notifies the user or a caregiver if the medicine is not taken.

- 3. Hardware Components
  - Microcontroller (e.g., Arduino or Nedelcu) – Controls the whole system.
  - Real Time Clock (RTC) – Keeps track of time to trigger medicine dispensing.
  - Servo Motors – Open specific compartments at set times.
  - Buzzer/Speaker – Provides audio alerts.
  - LCD or OLED Display – Shows medicine timing and instructions.
  - Wi-Fi Module (in case of Nedelcu) – Sends notifications to the caregiver via app or SMS.
  - Pill Box/Containers – Stores the medicine in separate slots (e.g., morning, afternoon, night).
- 4. Software and Programming
  - Code is written in Arduino IDE or similar platform.
  - Time is set for each dose using the RTC.
  - When the time matches, the microcontroller activates the servo motor to open the correct medicine slot.
  - At the same time, it triggers a buzzer/speaker to alert the user.
  - If medicine is not taken within a certain time, a notification is sent to the caregiver.
- 5. Testing and Validation
  - The system is tested to ensure:
    - Correct dosage at correct time
    - Accurate notifications
    - Proper functioning of components (motors, RTC, Wi-Fi, etc.)
- 6. Final Integration
  - All hardware is enclosed in a secure and easy-to-use box.
  - The system is powered with either an adapter or rechargeable battery.
  - User instructions are clearly labelled.

#### **IV. RESULT AND DISCUSSION**

**Improved Medication Adherence:** Studies indicate that smart dispensers can track medication intake in real-time, providing adherence reports to clinicians. For instance, a system that tracks the removal of a medication dose within a 2-hour window after the scheduled time recorded the dose as 100% adherence.

**Remote Monitoring:** Integration with mobile applications allows caregivers to monitor medication schedules and adherence remotely, facilitating timely interventions when necessary.

**User-Friendly Interfaces:** Devices with touch screens and auditory alerts have been shown to enhance user engagement and compliance.

#### **V. CONCLUSION**

The Smart Medicine Announcement and Dispenser System offers a promising solution to improve medication adherence and patient outcomes. While challenges exist, ongoing advancements in technology and design are expected to enhance the effectiveness and accessibility of these systems.

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