

# Automated Medicine Reminder Box

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**Abstract-** The Automated Smart Medicine Box is an innovative healthcare solution designed to enhance medication management for patients, particularly the elderly and those with chronic conditions. This device integrates advanced technology, including Wi-fi connectivity, mobile applications, and reminder systems i.e LED and buzzer to ensure timely medication adherence. The smart box features compartmentalized storage for various medications equipped with sensors that track pill inventory and consumption. Users receive real-time alerts on their smartphones for upcoming doses, missed medications. Additionally, caregivers can monitor adherence remotely, improving patient outcomes and reducing the risk of complications from missed doses. By promoting better medication management, the Automated Medicine Reminder Box aims to improve overall health and quality of life for users while easing the burden on healthcare systems.

**Keywords-** pill box, real time clock, ESP-32 microcontroller, Sliding Mechanism, medicine remainder, Android App.

## I. INTRODUCTION

The Automated Medicine Reminder Box represents a transformative approach to medication management, addressing the growing challenge of medication non-adherence, particularly among vulnerable populations such as the elderly and individuals with chronic illnesses. In an era where healthcare systems are increasingly burdened by preventable complications arising from missed doses, this innovative solution combines technology with user-centered design to enhance medication adherence and improve overall health outcomes.

The Automated Medicine Reminder Box is more than just a storage solution; it integrates advanced features such as IoT connectivity, automated reminders, and real-time consumption tracking to create a comprehensive medication management system. By bridging the gap between patients, caregivers, and healthcare providers, this device

fosters better communication and support, ensuring that individuals take their medications as prescribed.

With the rise of chronic diseases and an aging population, the need for effective medication management tools has never been more critical. The Automated Medicine Reminder Box not only aims to reduce the risks associated with missed medications but also enhances the quality of life for users by promoting independence and ensuring a seamless healthcare experience. As we delve into the features, benefits, and implications of this innovative device, it becomes clear that the Automated Medicine Reminder Box is poised to play a pivotal role in modern healthcare management.

To overcome these problems, a prototype of an Automated Medicine Reminder Box for old people and patients is developed in this paper. An airtight container is used for the purpose of keeping the

medicine fresh. An LCD display and voice alert system is used in the device. The purpose of LCD display is to show the right time and informative data for the patient. The alarming system with the human voice helps to understand which medicine should take and where to take. The LED helps the patient or people to choose the medicine as the user preset time which is kept in the specified compartment. The purpose of this research is to produce a low-cost design and construction of a microcontroller-based automated medicine box that implies it for the purpose of helping assistant. In this design, we have explored the use of both hardware and software to bring about the entire research. The hardware components are solely coordinated by the ESP-32 microcontroller chip.

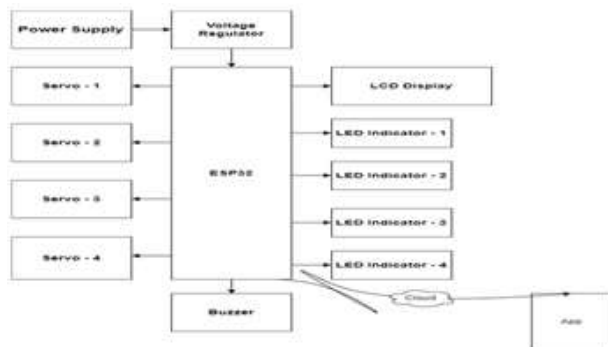


Figure 1: Block Diagram of Medicine Box

## Objectives

The objectives of proposed work are as follows:-

- Implement automated alerts and physical indicators to remind caregivers of scheduled medication times.
- Ensure patients receive medications on time, reducing the risk of missed doses and improving treatment efficacy.
- Send immediate notifications to caregivers' mobile phones to promptly address medication needs.
- Allow caregivers to monitor medication schedules and adherence remotely via the mobile application.
- Develop an intuitive LCD display and mobile app interface for easy navigation and interaction.
- Manage up to 4 separate medication schedules simultaneously for comprehensive patient care and operate automatically after getting path from the user.
- It emphasizes the integration of mobile technology for convenient medication management, catering to modern healthcare needs where mobile devices are ubiquitous.
- The term "Medicine Reminder" succinctly communicates the system's core purpose of timely medication alerts and adherence support.
- By leveraging a mobile application, the system offers flexibility, real-time notifications, and user-friendly interaction through smartphones, aligning with current trends towards digital health solution that enhance patient care and caregiver oversight.

## II. EXPECTED RESULTS

- Patients adhere more consistently to prescribed medication schedules, enhancing treatment effectiveness.
- Decreased instances of missed doses or incorrect timing due to automated reminders and alerts.
- Caregivers receive timely notifications, enabling proactive medication management and reducing caregiver stress.
- Streamlined process of organizing and administering medications across multiple boxes, promoting efficiency in healthcare settings.
- Positive user feedback due to the system's ease of use, reliability, and contribution to overall health management.
- Expected improvements in patient health outcomes through consistent medication adherence and management.

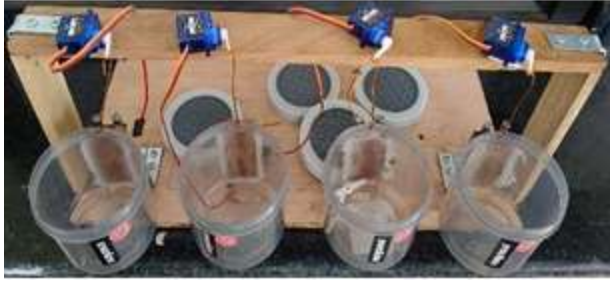


Figure 2: Sliding Mechanism of Medicine Box

- **Increased Medication Adherence:** A significant rise in the percentage of patients taking their medications as prescribed, leading to improved overall adherence rates.
- **Reduction in Medication Errors:** Fewer instances of missed doses, incorrect medications, or wrong dosages, resulting from organized storage and automated reminders.
- **Enhanced Patient Engagement:** Greater involvement of patients in their medication management, leading to increased confidence and autonomy in handling their health.
- **Improved Health Outcomes:** A measurable decline in complications related to chronic conditions due to better adherence, translating into fewer hospitalizations and emergency visits.
- **Streamlined Communication:** Improved communication channels between patients, caregivers, and healthcare providers, facilitating timely interventions and support.
- **Real-Time Monitoring Insights:** Access to valuable data on medication usage patterns, helping healthcare providers tailor treatments and identify potential adherence issues early.

### III. CONCLUSION AND FUTURE SCOPE

The Automated Medicine Reminder Box stands as a transformative solution in the realm of medication management, addressing the critical issues of non-adherence and medication errors. By leveraging advanced technologies such as IoT connectivity, automated reminders, and real-time monitoring, the Automated Medicine Reminder Box empowers users to manage their medications more effectively and fosters greater communication between patients and caregivers. The anticipated benefits –

including improved adherence rates, enhanced health outcomes, and reduced healthcare costs—highlight its potential to significantly impact individual health and the broader healthcare system.

The future of the Automated Medicine Reminder Box holds significant promise for further enhancements and broader applications:

- **Integration with Wearable Devices:** Future versions could integrate with wearable health technologies, allowing for holistic monitoring of health metrics alongside medication adherence.
- **Artificial Intelligence and Machine Learning:** The incorporation of AI can personalize reminders and adapt to users' behaviors, improving adherence through tailored notifications and insights.
- **Expanded Data Utilization:** Enhanced data analytics capabilities could facilitate deeper insights into adherence patterns, enabling healthcare providers to make informed, data-driven decisions for individualized patient care.
- **Telehealth Compatibility:** The Smart Medicine Box could be linked with telehealth platforms, allowing healthcare providers to monitor adherence remotely during virtual consultations, thereby enhancing patient engagement and support.
- **Customizable Features:** Future designs may include customizable options to cater to specific populations, such as pediatrics or individuals with cognitive impairments, ensuring usability across diverse demographics.
- **Global Implementation:** Efforts to make the Smart Medicine Box affordable and accessible in underserved regions could bridge gaps in medication management, improving health outcomes on a global scale.
- **Community Support Features:** Future iterations could include platforms for community support, enabling users and caregivers to connect, share experiences, and offer encouragement.

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