IARJSET

ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 11, Issue 7, July 2024

DOI: 10.17148/IARJSET.2024.11777

SMART MEDECINE BOX

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Abstract: The smart medicine box is a microcontroller-based device designed to address medication non-adherence. It not only dispenses medicines at prescribed schedules but also incorporates a basic health monitoring system. The system sends SMS notifications to users once their medicine has been dispensed. The proposed medicine box helps the patient to take the right medicine at the right time along with an SMS which will help the patient to take the medicine. The basic ideology is integrating the principle of Alarm clock.

Keywords: microcontroller, Health monitoring, Sensor, alarm clock, SMS notification

I. INTRODUCTION

According to the World Health Organization (WHO), over 80% of the people above the age of 50-60 years are prescribed medicine, that are to be fed 2-3 times in a day. Many of old people live alone, some of them are suffering from disability, making it harder to take care of themselves. Any delay in taking their medicine or even taking it at the wrong time may cause or raise potential health issues.

To address these challenges, we introduces an innovative medication management system that leverages advanced technology to streamline medication intake and enhance caregiver monitoring. By promoting medication adherence, reducing medication errors, and enhancing caregiver communication, “Smart Medicine Box” strives to improve patient outcomes and enhance the overall quality of healthcare delivery. Smart medicine boxes are designed to help patients, especially the elderly, adhere to their medication schedules. They monitor the patient’s health and ensure timely medication intake. These boxes can be programmed to dispense medicines at specific times

II. LITERATURE PAPER

[1] Aakash Sunil Salgia*, K. Ganesan and Ashwin Raghunath proposed the system designed to help these patients to take the required medicine in the right proportion at the right time. The basic ideology is integrating the principle of Alarm clock with Light based slot sensing on a normal pill box. An alternate to the light based sensing method using capacitive fields is also employed. To make it more state-of-the-art, it is inbuilt with a GSM module for alerting the patient and also the chemist at the needed instant.

[2] Roy ABI ZEID DAOU ,Khalil KARAM, Hiba ZEIDAN,JOSEF BORCSOK proposed An advanced medicine box monitoring, analysis and control system .The latter design is based on a smart and safe medical box that assists patients in taking their pills treatment on time.

[3] Obaidulla-Al-Mahmud, Md. Kausar Khan, Rajdeep Roy, and Fakir Mashuque Alamgir proposed a smart IoT based healthcare system,which contains an intelligence medicine box associated with sensors and server for regular health monitoring. This smart medicine box with wireless internet connectivity helps the patients to get regular health care and create easy communication between doctor and patient without meeting physically. The proposed medicine box helps the patient to take the right medicine at the right time along with an email which will help the patient to take the medicine.

[4] Zara Nasir *, Amina Asif , Muhammad Nawaz and MuhammadAli proposed a smart medical box that dispenses not only medicines at prescribed schedules but also has a basic health monitoring system for the patient’s temperature, oxygen level, and heart rate detection, thus relieving the patient from visiting a doctor. This device is Raspberry Pi-controlled, having an added security feature of biometric recognition so that the medicine is dispensed to the correct patient. Moreover, the user is notified once their medicine has been dispensed via SMS.

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[5] S. Mukund and N.K.Srinath proposed an idea of medication dispenser interfaced with an alphanumeric keypad, an LED display, a Motor Controller, an Alarm system, a multiple pill container and dispenser. The overall operation is to facilitate the user to set the timings to dispense multiple pills at required timings. The Alarm system is designed to provide two types of indications – one by lighting an LED and the other by providing a beep sound. The user is required to press a button to get the pill and reset the alarm button. The second alarm is to indicate the optimal availability of the pills in the container to warn the user to refill the dispenser with the required quantity of pills.

III. METHODOLOGY

A. BLOCK DIAGRAM

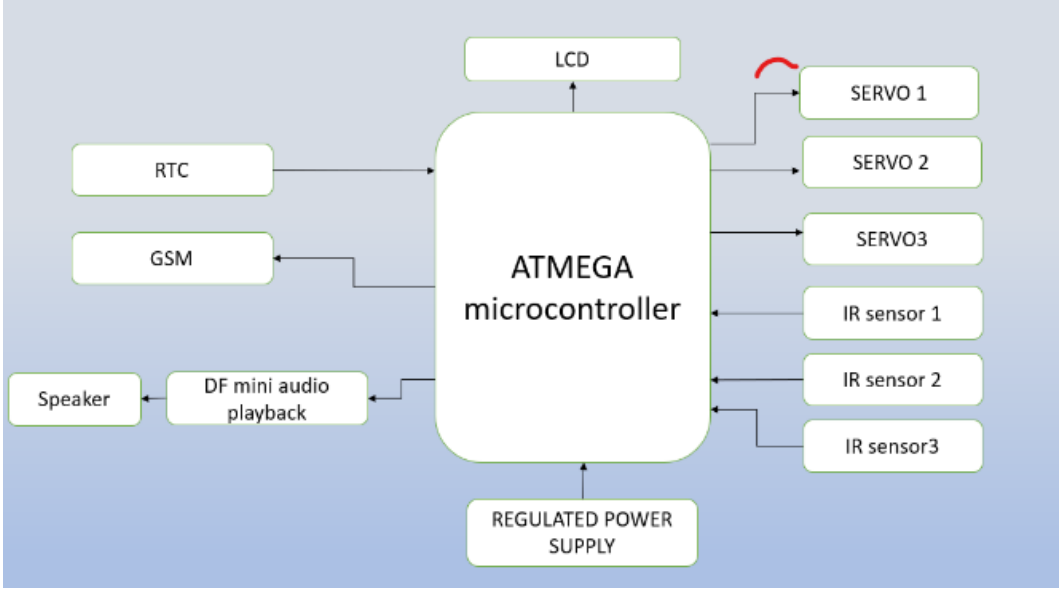

Figure 1: block diagram of smart medicine box

B. WORKING

On powering on the system, the microcontroller initializes all hardware components, including servo motors, RTC module, DF mini audio module, IR Sensors, LED indicators, and LCD display. At the predefined medication times, the microcontroller triggers the corresponding servo motor to open the designated medication compartment, allowing the patient access to their medication. Simultaneously, the DF mini audio module plays an audio prompt to alert the patient to take their medication, while LED indicators blink to draw attention to the opened medication compartment. During medication time, the IR Sensors will detect whether the medicine has been taken or not.

Upon medication dispensing, the system sends an SMS notification to the caregiver, informing them of the medication intake event and providing real-time updates on patient adherence. The LCD display shows the current RTC time details of the medication dispensed, providing patients and caregivers with real-time information.

Patients interact with the system by retrieving their medication from the opened compartment and acknowledging the audiovisual alerts.

Caregivers monitor medication intake events and receive SMS notifications.

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- **FLOWCHART**

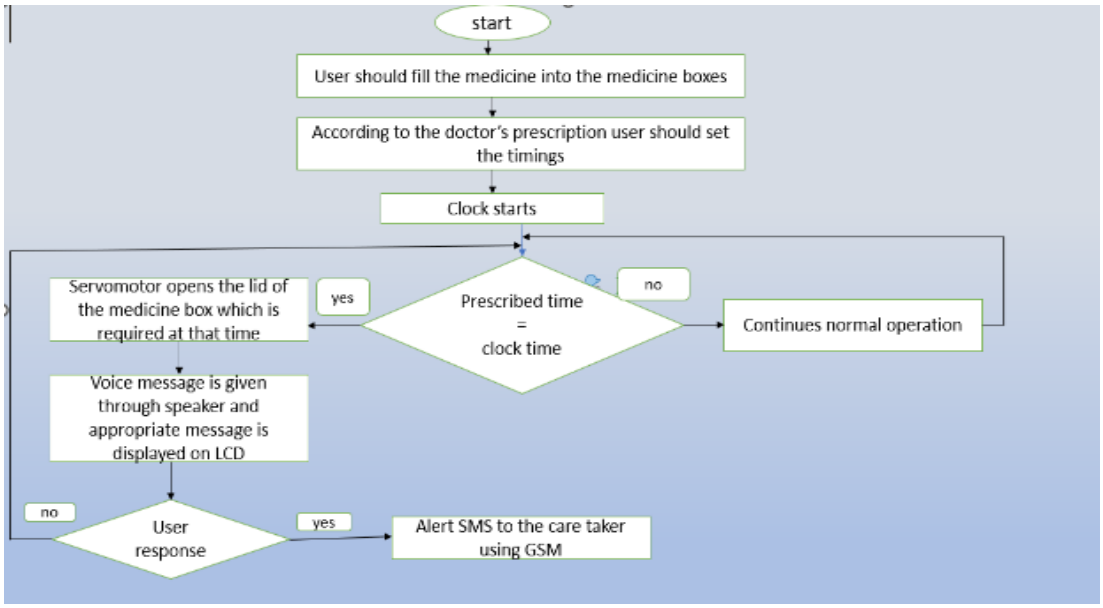


Figure 2 : flow chart of smart medicine box

IV. RESULTS

The prototype of the proposed system is shown in Figure 3.

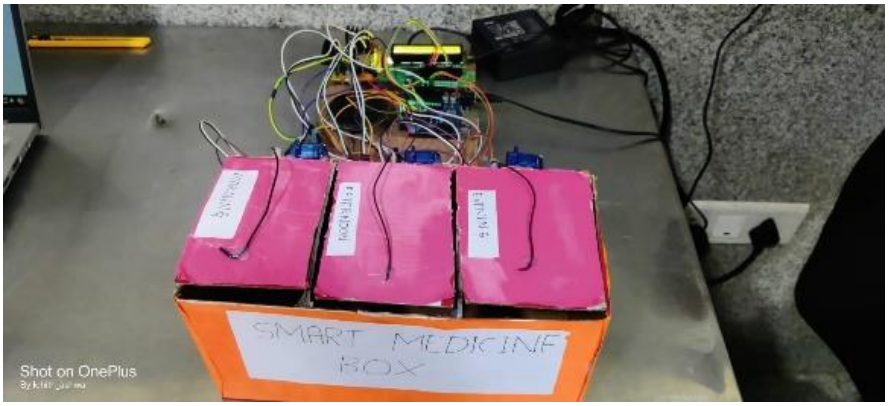
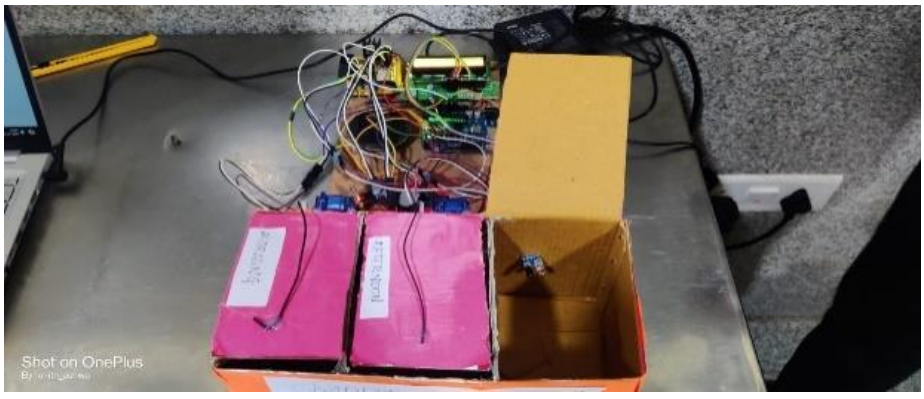


Figure:3



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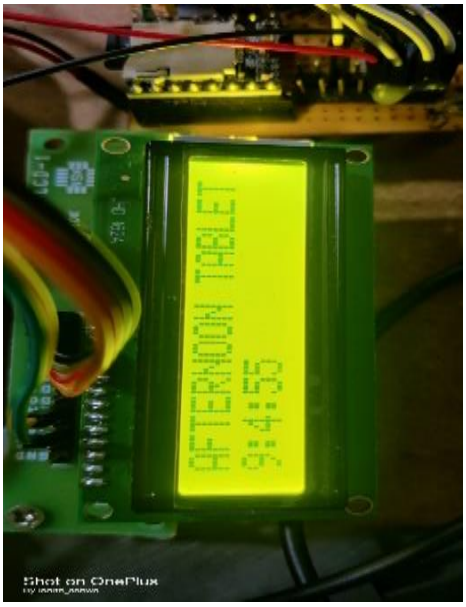

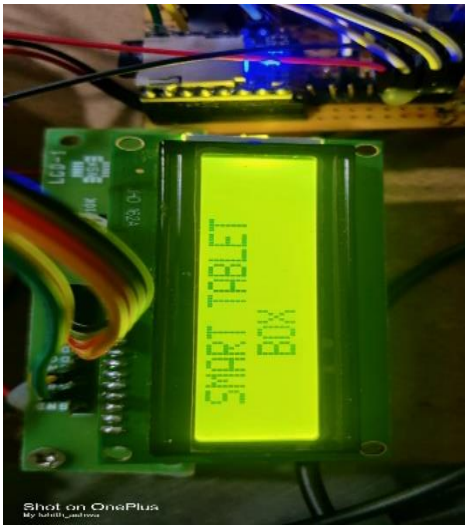

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V. APPLICATIONS

- **Hospitals:** To help the care taker to track the data of the assigned patients. If there are more number of patients assigned to care taker this project helps the care taker to monitor each patient easily.

- **Old age homes**
- **Houses with old and sick people**

- **Medication Adherence:** It helps patients adhere to their medication schedules by providing reminders and notifications, reducing the risk of missed doses.

- **Real-Time Monitoring:** The box can track when medications are taken, providing caregivers and healthcare providers with real-time data on patient compliance.

- **Remote Patient Monitoring:** It enables remote monitoring of medication adherence and health status, allowing healthcare providers to intervene promptly if issues arise.

- **Personalized Care:** By storing patient information and medication schedules, it can tailor reminders and alerts based on individual needs and conditions.

- Overall, the smart medicine box represents a significant advancement in patient care, leveraging technology to improve medication adherence, safety, and overall health outcomes.

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