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ANDROID-BASED MEDICINE REMINDER AND VENDING MACHINE

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ABSTRACT-In this project a Smart Medicine Reminder and Vending Machine has been developed. Many old people have the tendency of missing the medicines or taking the medicines at wrong time. Often, they require someone to give them the medicines. Hence it is required to design a Medication Reminder Device that can help old people and many other patients to take medication on schedule. In situations like the CoVid-19 pandemic there is a physical contact between the patient and the caretakers, doctors. So, the device developed is capable of delivering medicine at prescribed time in which care-taker of the patient can store medicine in small boxes which will drop out according the time entered. Arduino IDE software platform and Arduino Mega along with RTC, servo motors, LCD, MP3 player, LED, Rotary Encoder with push button, IR sensor as hardware are used to build this project.

1. INTRODUCTION

The healthcare industry is continually seeking innovative solutions to improve patient outcomes. One such area is medication adherence, which is crucial for effective treatment. To address the challenges associated with timely medication intake, particularly during health crises like the COVID-19.The COVID-19 pandemic has highlighted the critical need for innovative solutions that reduce the risk of virus transmission while ensuring optimal patient care. Traditional methods of medication administration, which often involve physical interaction between healthcare providers and patients, can increase the likelihood of infection.

Fig1: medicines receiving from vending machines

In addition to the pandemic, many individuals, especially the elderly and those with chronic conditions, face challenges in adhering to complex medication regimens. Forgetting doses, taking incorrect dosages, or missing medications altogether can lead to adverse health outcomes. A smart medication dispenser can address these issues by providing a reliable and convenient solution we have developed a smart medication dispenser [4]. This device is designed to automate the process of medication administration, reducing the risk of human error and minimizing physical contact between healthcare providers and patients [3]. By incorporating an embedded system, the dispenser can accurately store and dispense medications at pre-programmed times. The system also includes features such as audible alerts and data logging to enhance patient compliance and enable remote monitoring.

2.LITERATURE REVIEW

The aim of this project is to remind individuals who forget to take their medicines on time. Elderly people because of their age typically forget about to take their drugs. This project will support to remind the patient to take his/her medicinal drug at prescribed time [1]. The proposed system is best suited for elderly persons and those who are busy, as this device will now not most effective remind them of their drug treatments with a buzzer sound however also shows the call of the medication to be taken at that time [2].

The patient can store the respective time of the unique medicine by a matrix keypad [5]. Based on an RTC (Real Time Clock) interfaced to the microcontroller, the programmed time for medicinal drug is displayed on the LCD in conjunction with a buzzer sound to alert the patient approximately taking the best medicine. The microcontroller used in this challenge is of 8051 family [8]. RTC used maintains a correct time as it is supported with the assistance of a crystal [6]. Ilkko et al4 proposed UbiPILL A Medicine Dose Controller of Ubiquitous Home Environment.

Home automation and wireless sensor network which have enhancing the quality of life by providing security, information and comfort [7]. Here had discuss a centric home server with three main roles: use of existing Interfaces on registered systems for remote monitoring and Control.Telemedicine concept is cost efficient and location autonomous monitoring system, the suitable and secured medical data can be transferred with different devices with attention towards security and privacy issue [9]. Emergency situations need on the flutter network integration and data transmission fluctuating from domains like patients home, medical practices, ambulances and, hospitals [10].

3.BLOCK DIAGRAM:

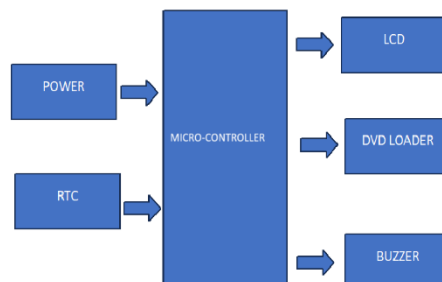The Block Diagram of our prototype is as shown below

Fig 2: represents the block diagram

- **LCD (Liquid Crystal Display)**

LCDs are available to display arbitrary or fixed images with low information content, which can be displayed.
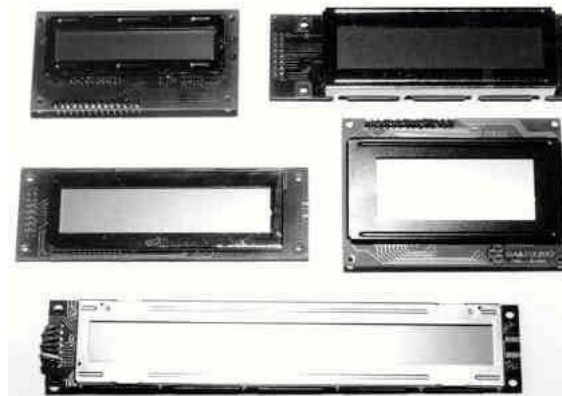

Fig 3: Represents LCD

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector.

Fig 4: Represents Buzzer

- **Buzzer**

A buzzer or beeper is an audio signaling device,[1] which may be mechanical, electromechanically.

Fig 5: Represents WIFI mounting plate

- **WIFI Module Mounting Plate**

LEDs or street light bulbs represent the actual street lights. They can be connected to the relay module, allowing the Arduino to control their on/off state.

Power Supply Board: A **power supply** provides the necessary voltage and current to power the DVDplayer,WIFImodule.
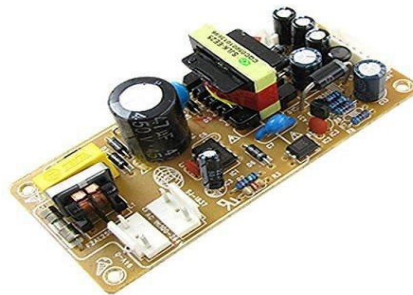

Fig 6: Represents Power Supply Board

- **Wi-Fi Module (ESP8266)**

The **ESP8266 Wi-Fi module** enables the Arduino Uno to connect to the internet, allowing for remote control and monitoring via an IoT platform.
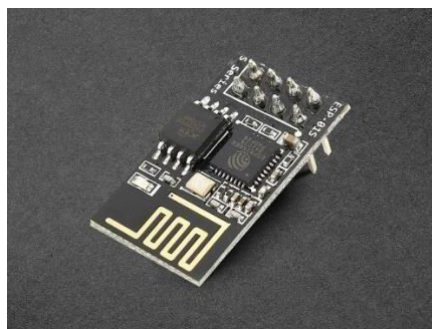

Fig 7: Represents Wi-Fi Module

- **DVD Player**

Fig 8: Represents DVD PLAYER

A DVD player is used which is connected to the WIFI module, it will be used to dispense the medicines at the updated time in the website.
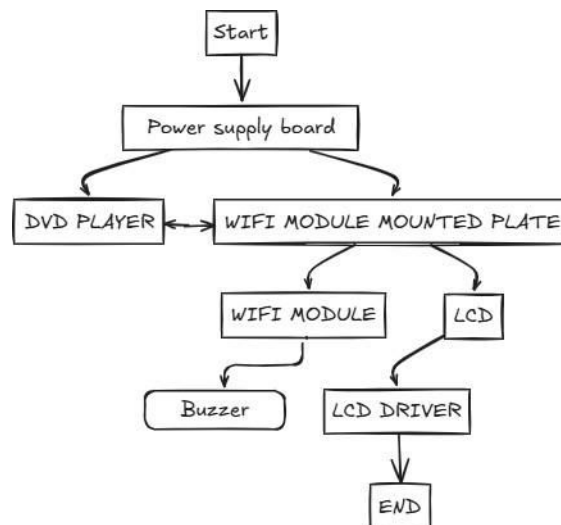

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Fig 9: Design flow of the project

At first initialize the system by ensuring the power supply board is connected to all the components and all the components are receiving adequate power .DVD player connected with WIFI module and power supply ,it is used to dispense the medicine at the prescribed time. WIFI module mounted plate makes a two way connection between Wi-Fi module, lcd ,buzzer and DVD player. WIFI module requirement is that this system is designed to fetch specific data from a website to enhance the operation of a DVD to dispense medicine. LCD is used to display information about medicines, including their names. LCD driver helps to regulate and maintain the correct power supply required for the proper operation of the LCD. Buzzer in The system is designed to help users remember to take their medication on time. Whenever it is the scheduled time to take medicine, a buzzer will sound as a reminder.

The Smart Medicine Reminder and Vending Machine incorporates a Wi-Fi module, a DVD player mechanism for dispensing medicine, and a buzzer for notifications. The Wi-Fi module allows the system to connect to the internet for remote configuration and monitoring, enabling caretakers or doctors to schedule medication times and update settings from a distance. The DVD player mechanism is repurposed to dispense medicine by utilizing its precise tray movement to release the required doses at the set time. When it is time to take

the medication, the buzzer sounds to alert the patient, ensuring they do not miss their dose. This combination of technologies ensures timely medication adherence while allowing remote management and reducing manual intervention. Enables remote connectivity for the system, allowing caretakers or doctors to schedule medication timings or monitor activity through a connected app or platform. It facilitates data exchange between the system and a remote server or device. The DVD tray mechanism is repurposed to function as a medicine dispenser. Its precise motorized movements allow the system to release medicines stored in compartments accurately at the scheduled time. Acts as an audible alert system. It sounds an alarm when it is time for the patient to take their medication, ensuring that they are reminded even if they are not near the machine or visually monitoring it Displays information such as current time, upcoming medicine schedule, or instructions for the patient. It serves as a user interface for the system. At pre-scheduled times, the system dispenses medicine stored in compartments, utilizing the DVD mechanism's tray for precise dispensing. A buzzer or MP3 player alerts the patient when it's time to take their medicine. This system reduces physical contact between healthcare workers and patients, ensuring safe and timely medication delivery, particularly beneficial during situations like the COVID-19 pandemic.

4.RESULTS

The Smart Medicine Reminder and Vending Machine successfully demonstrated its ability to assist elderly and patients in adhering to prescribed medication schedules. The integration of the DVD Player, LCD and Wi-Fi module enabled precise scheduling and remote configuration of medication dispensing times. The DVD player mechanism efficiently dispensed the medicine at the correct times, with the servo motors ensuring smooth and accurate compartment delivery. The buzzer and MP3 player provided timely reminders to patients, ensuring that they were alerted when it was time to take their medicine. The system also displayed important information, such as the current schedule and alerts, on the LCD, allowing caretakers to easily interact with the system and adjust medication schedules as needed.
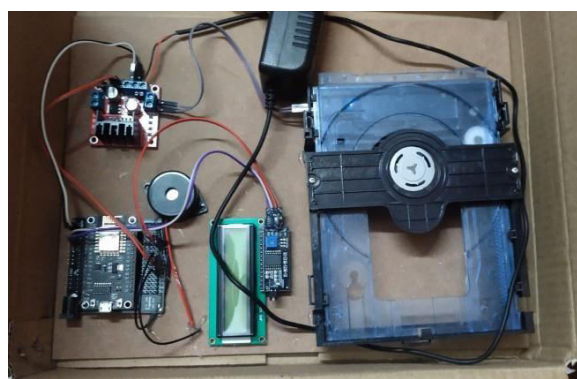

Fig 10: Represents the final results of the project.

The Wi-Fi module added an extra layer of functionality, enabling remote monitoring and adjustments, making the system adaptable and accessible for caretakers and healthcare providers. Overall, the system performed reliably, providing an efficient solution for medication management, minimizing human

intervention, and ensuring safety and accuracy in medicine dispensing. It also proved to be a valuable tool for reducing physical contact between healthcare workers and patients, particularly in the context of health crises like the COVID-19 pandemic.

5.CONCLUSION

This system significantly reduces the likelihood of missing medication, ensuring that patients receive their prescribed doses on time without fail. It enables doctors to monitor patient health more effectively by providing seamless access to test results and patient records, allowing for more accurate diagnoses and timely interventions.The product is particularly beneficial in scenarios such as Covid-19 quarantine centers, where it can be conveniently installed next to patient beds. By automating medication delivery, it minimizes the risk of exposure for healthcare workers, maintaining a safe distance between them and infected individuals. This feature is crucial for protecting frontline workers while ensuring uninterrupted care for patients.

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