iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** V **Month of publication:** May 2023

DOI: https://doi.org/10.22214/ijraset.2023.52139

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue V May 2023- Available at www.ijraset.com

Medicine Dispenser Using RFID

Aryaman Paigankar[1], Manthan Patnekar[2], Aditya Santosh[3], Vishakha Kelkar[4]
[1, 2, 3]*U.G. Student, Department of Electronics and Telecommunication, D.J.Sanghvi College of Engineering, Vile Parle (W)*
[4]*Associate Professor, Electronics and Telecommunication Department D.J.Sanghvi College of Engineering, Vile Parle (W)*

Abstract: ***A medicine dispenser powered by a Atmel ATmega2560 controller was proposed in this article as a way to help people take their medications on schedule and in the recommended dosages given by their physicians. Only two out of fifty people use this innovative assistance due to its high cost, lack of information on the subject, and accessibility. It has been discovered that people are more concerned about their physique than their well-being, with many older people needing at least two assistive items per family by the year 2050. This device plan helps patients avoid this problem by reminding them to take their prescriptions on time and within the recommended window. It provides updates for patients, which is helpful for people who are aware of when to take their dosage and is particularly helpful for those who forget to do so. One of this device's key advantages is the ease of use and affordability of the framework. The device uses an Arduino MEGA, LCD display, Real-Time Clock (RTC) module, and RFID to inform patients and remind them to take their medications at the recommended time. This concise and useful framework can be of great use to older patients and those who are economically disadvantaged. Families with older citizens may find this medicine dispenser helpful as their responsibilities are reduced by reminders to take prescription medications as directed. The framework has also been connected to an online database to track the patient's medical history when needed.***

Keywords: LCD Display, Real Time Clock (RTC) Module, Arduino MEGA, Online Database, Medicine Dispenser.

I. INTRODUCTION

Following study of mortality rates over an extended period of time, John Hopkins Patient Safety Experts estimate that more than 250,000 fatalities result from improper prescriptions. Improvement in the therapeutic field assumes a major role in the sustainability of wellbeing. Also, it appears that the vast majority of Indians are fatally impacted by the inability to timely receive the proper medication.

The problem is more prevalent at night when people need medicine urgently, yet pharmacies are closed or their supply of medications may not be available. One of the most frequently noted causes of a medicine's failure to heal a patient is the failure to take a prescription when it is needed or prescribed. Those who are 50 years or older are more likely to get ailments, such as hypertension, diabetes, Alzheimer's disease, and Parkinson's disease. A missed dose for such a patient may have serious negative consequences. As a result, the patients must take the medicine as directed. Patients will frequently forget to take their prescribed medications at the proper times as they get older. Working people frequently forget their medications too due to their fast-paced lives and failure to maintain a balance between work and social life.

This initiative intends to assist people in taking their medicines, especially those taking many medicines, and to help them choose the appropriate medication for their condition. So, this project will direct people to information about the patient's status regardless of whether he has received medication. Today's age makes it difficult for nearby services to be available all the time for the elderly. The vast majority of families in the general public today are nuclear households. The older generation favours independence and sometimes shows ignorance towards their medicines. This puts their health at risk and also causes worry for their children regarding their parents health. Occasionally, despite taking all such precautions, people forget to take their medications. This tool seeks to decrease the likelihood of that specific event.

Radio Frequency Identification or RFID is a programmable identification device that allows for the tracking of people and objects. RFID transmits and receives data stored on a tag to or from a reader using electromagnetic waves. RFID framework comprises of a radio frequency tag, the reader, which is essentially a transceiver operated by a microprocessor for acquiring information from a tag, and a program for gathering, putting away, as well as managing codes retrieved from the tags. Because there is no requirement for direct line of sight for communication, RFID technology has an advantage over other systems, such as magnetic strip cards, barcode systems, and biometrics (voice, fingerprinting, retina checking). It also withstands harsh physical conditions, takes concurrent ID into consideration, has good information storage with a wide read range, and is cost-effective and power efficient.

©IJRASET: All Rights are Reserved

The dispenser uses a care card to hold client information, such as usernames, passwords, client prescriptions, and so on. So here we utilize the RFID tag to distinguish the user and this RFID label uses radio frequency identification technology to track patient records, such as login information and the number and prescription filled by a client and retain it for later use. The read/write device, the marker, and the management of the data system for data handling, transmission, and collecting are all included in the RFID tag framework. Arduino Mega R3 is used as the system's main controller to connect each module to its purpose. Since more pins are needed for the machine, we have chosen Arduino Mega R3 as the primary microcontroller.

II. OBJECTIVE

The current society places a lot of weight on studies done to extend human life. Drugs and prescriptions are being improved or enhanced to treat any condition as quickly as feasible in order to lower risk. Development entails a large part in promoting health in this area. The installation of a medication dispenser may positively impact the function of medicines in all aspects. Pills have become a significant part of daily life, and carelessness involving appropriate medication for patients has occurred multiple times. One example of such a circumstance is the time when an attendant gave a patient a paralytic rather than an anti-acid recommended by the specialist, which led to the patient's death.

Safety specialists calculated that over 250,000 deaths occurred due to the improper medication being used or its administration after observing the mortality rates in recent years. Consequently, we can state that patients taking the proper medication at the appropriate time is crucial; in any instance, taking the incorrect medication, overdosing, or failing to take the proper dosage can result in several risky outcomes, ranging from minor medical difficulties to fatalities. The most well-known kind of dementia, which is a broad term for cognitive decline and other abilities severe enough to impair with daily activities, is Alzheimer's disease. Using a medicine dispenser will help them with memory-related impairment by prompting them to take their medications on time. Hence, by creating this, we hope to manage this problem. A key component of this drug dispenser is an Arduino Mega R3. The most prevalent method of delivering medication to people will be improved by this medication device, coupled with ensuring that patients take their medications as prescribed. This medicine device is basically expected for:

1) Elderly Patients
2) Patients who are visually challenged
3) Patients with chronic illnesses

Medical errors are frequently made when requesting, recording, administering, and organizing the use of medications. The two most common causes of drug-related errors, which are prescription misunderstanding and the difficulty of adhering to rigid medication schedules, are expected to be eliminated by this dispenser. Setup in nursing homes can help with recognizing the medicines of numerous patients, reducing the risk of accidentally ingesting the wrong medication and further reducing the burden on attendants and other professional staff who work there. Individuals on time-sensitive medicine regimens, such as those who have recently undergone transplants, need not contemplate about not taking prescriptions on time. The gathering and exchange of urgent network-connected information through a strong service layer defines IOT. In essence, the wireless network that is used to share information and data is also used to impart and produce new information that may be collected and evaluated for later uses. Using the Internet of Things has made it easier to collect real-time data.

III.LITERATURE SURVEY

There are many people who may need constant assistance, including our elderly loved ones, family members, or persons with special needs. While taking a certain medication, time is more important for older people than for others in order to prevent any dysfunction or illness. Nevertheless, deteriorating vision and memory come with ageing; what if the patient has a dementia-like condition? For this precise reason, extensive study has been conducted to improve these people's sense of comfort and ease in their daily lives. In his 2017 work titled "Intelligent Pillbox: Automated and Programmable Assistive Technology Device," Juan Marcelo Parra created a circular medication box that rotated itself at the appropriate dosage intervals. This was a little device with some restrictions. Wissam Antoun published his paper named "SmartMedicineDispenser(SMD)," which included a dispensing device and an Android application that would provide notifications when the patient's dose was about to be taken or if they had missed it. The "MEDIBOX IoT-Enabled Patient Assisting Device" was published in 2016 by Achsah Mary Marks. The ‘Automated Medication Delivery System’, another project akin to "MEDIBOX," was created by Ms. Bhagya Shree SR. This also saw the LCD display and the patient notification auditory buzzer signals. Animesh Kumar Sahu wrote a paper titled "Automatic Pill Reminder for Easy Supervision" in 2017. This project employs an LCD display to show the patient the medication to be taken, together with a GSM

module application to send direct text messages to either the patient or the person in charge of the patient's medications. So, the patient or the person in charge can receive an SMS when it's time to take the medication or a notification that the medication's supply is running short and will soon be depleted, necessitating a prescription renewal. The "Design of Automated Smart Medicine Dispenser" by Piyush R. Pawar and Shubham Kaikade introduces a dispenser with the use of the Raspberry Pi, providing more benefits and greater room for improvement.

Such tools give patients and the professionals who care for them a stronger sense of security in terms of accountability and safety. The wellbeing of all-the medical is always paramount. With this in mind, we can be more progressive and improve the environment for those who aren't as able.

IV. PROPOSED DESIGN

Here, the essential component is the Arduino Mega R3. In this project, a card and an RFID scanner are being used. The LED displays read information and the RFID readers interpret the client's data if the RFID card is approved by the reader when it is brought close to the scanner. The machine then delivers the aforementioned drugs using a servo motor. In the event that there is an inconsistency while reading the card, "Card not Acknowledged" will appear on the LCD display. The "Out of Stock" warning will appear on the LCD panel once the load of drugs has been completed. Moreover, we intend to connect this to the perfect number so that the client is informed when the the medications are finished. Also, it can be connected to the number of medicine stores to effectively submit a request for an order renewal. The pharmaceutical container would be a small box divided into a few parts for a selected number of patients to keep pills for a predetermined period of days. The case will be connected to an RTC board, with an Arduino microcontroller unit serving as the fundamental microcontroller that will monitor and follow functions and determine when peripheral devices should respond to requests. Each patient receives an RFID tag. The medication will be distributed as the RFID tag is carried close to the scanner. Using RTC aids in comparing the dosage to be administered over time. The clock's data will include seconds, minutes, and hours. When it approaches approaching the designated intake period, the continuous clock will begin to tick and the signal will notify the patient. A warning message will then be displayed on the LCD. LCD is also utilised to display important messages from programmes, such as patient names, dates, and times. We want to employ a WiFi module to transmit the results that will be stored in the database. When a legal tag is scanned at the designated moment, the RFID tag and reader give the project a core level of security that dispenses the proper drug and dosage.

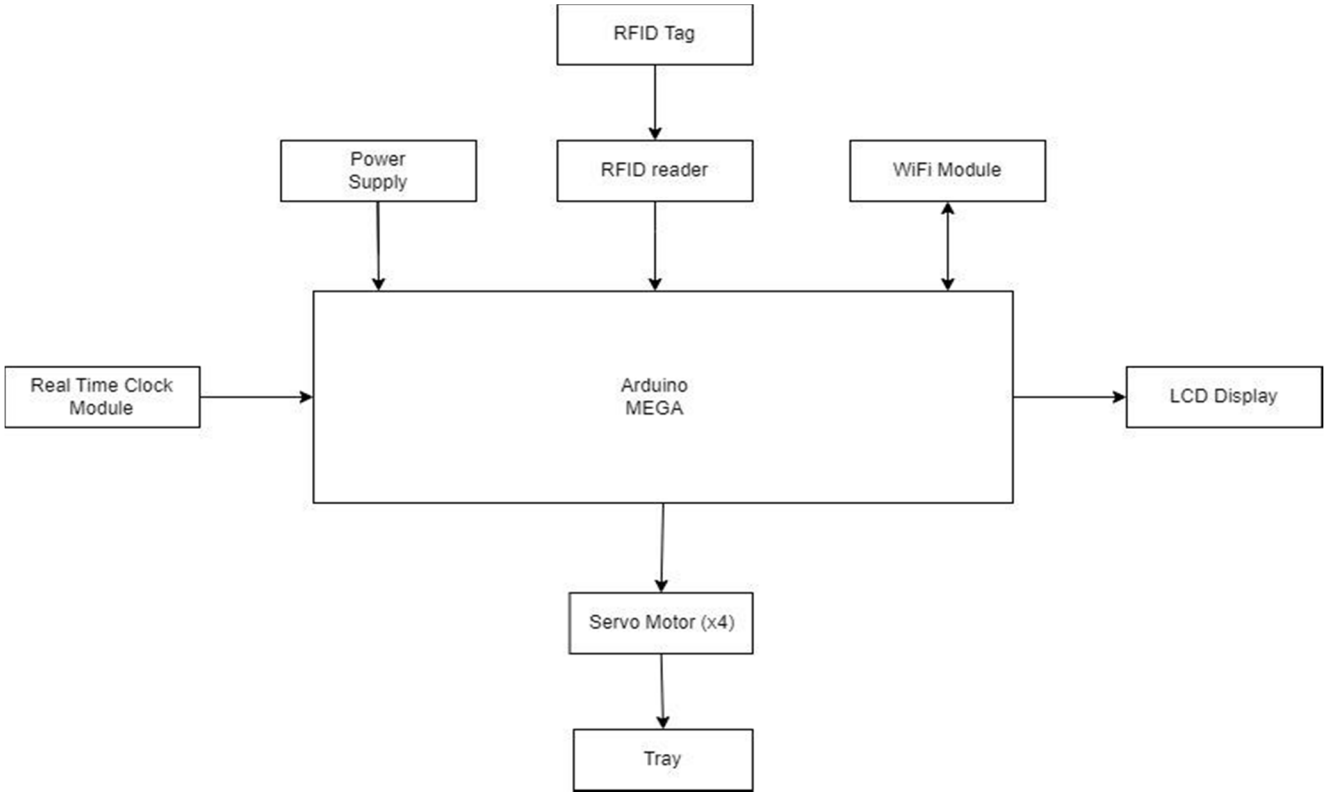


Fig.1 Block diagram of proposed design

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue V May 2023- Available at www.ijraset.com

V. IMPLEMENTATION

This medicine distributor utilizes an Arduino Mega R3 board, including an Atmel ATmega2560 microcontroller with a working voltage of 5 volts and input voltage between 7 to 12 volts. This Arduino Mega R3 board comes attached with an ESP8266 Wi-Fi Module, which is used to give Arduino network connectivity.



Fig.2 Arduino mega with Wi-Fi module

The use of Radio Frequency Identification (RFID) technology has brought about a sea change in the methodology behind the collection and administration of patient data in healthcare settings. Because RFID tags have their own power sources and are able to transmit powerful signals over substantial distances, they are an extremely useful technology for use in applications related to the medical industry. In this scenario, radio frequency identification (RFID) tags are affixed to medication containers, and RFID scanners are mounted on medicine dispensers in order to guarantee that medication is dispensed in an appropriate and timely manner. When a customer gives their RFID card to the dispenser, the card is read and the customer's name is shown on a 16x2 alphanumeric LCD display. This happens when the customer presents their card. This display informs the customer about the medication that has been delivered to them, which helps to ensure that they receive the appropriate medication.

The primary dispensing mechanism of the system is comprised of a circular container with a rotating base. The container is divided into two sections: one for holding pills and the other for administering medication. Each segment is located on opposite sides of the rotating base. A Servo motor, which is mounted to the bottom of the base, rotates the container so that a single pill can be dispensed. When a customer initiates the mechanism, a servo motor turns the base to the dispensing side, where it acquires a single pill before rotating to the opposite side, where it dispenses the pill to the customer. Together, the spinning servo and the divider inside the container work to dispense one pill at a time, so ensuring that the appropriate medication is administered.

The system has three containers, each of which can be used to distribute a different medication simultaneously. This makes it possible to dispense medication to several customers in a manner that is both efficient and accurate. In addition, a website that allows access to the patient's medical history has been developed. This website gives medical practitioners quick and simple access to patient records and makes the administration of medications much simpler.

©IJRASET: All Rights are Reserved

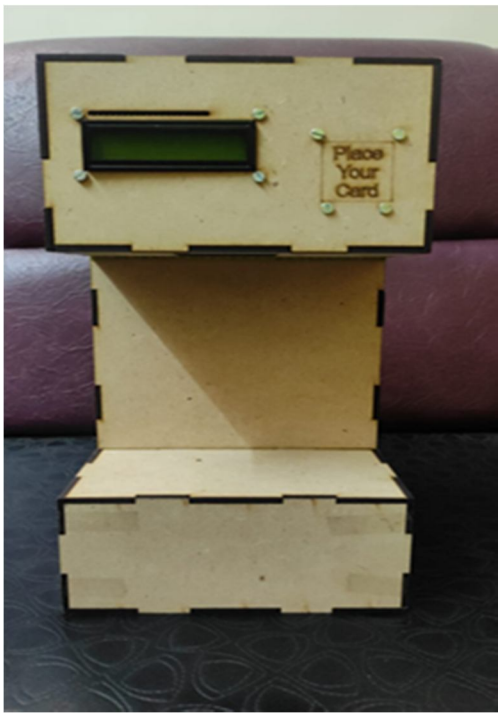


Fig.3 Medicine Dispenser

VI. SOCIAL IMPACT

Prescribed administration becomes burdensome, and the elderly suffer the negative impacts of several problems with their vision, thinking, and physical capacity. This medicine dispenser will eventually become a tool that helps a large number of individuals take their medications properly while staying independent in the comfort of their own homes and away from healthcare facilities. Developing this medication dispenser will strongly focus on raising the standard of living for senior citizens and patients who depend on medical care specialists for their livelihood. The proposed design is aimed towards Alzheimer's and dementia patients since it can offer an orderly approach for medication consumption. It can also be used by those who struggle with psychiatric problems, learning difficulties, physical troubles, patients taking daily medications for a chronic condition such as those related to the heart, and people who are visually challenged. In any event, very few studies have looked into how patients understand missed doses or the degree of patient-physician agreement or disagreement. A gadget for administering medications simplifies the difficult process of managing medications by completely preventing accidental overdoses and further promoting adherence. Collaboration with the beneficiaries will prevent errors from occurring in clinics and ageing homes where many medications are used.

Every nursing home employing this device can potentially help reduce the likelihood of mistakes occurring and speed up caregiving by allowing the device to be filled quickly and without many problems. It can also be repeated for various patients depending on their needs. Improved coordination and medication error counteraction are essential to achieving the more extended goals of improving older patients' health status and lowering hospitalisation rates, among other things.

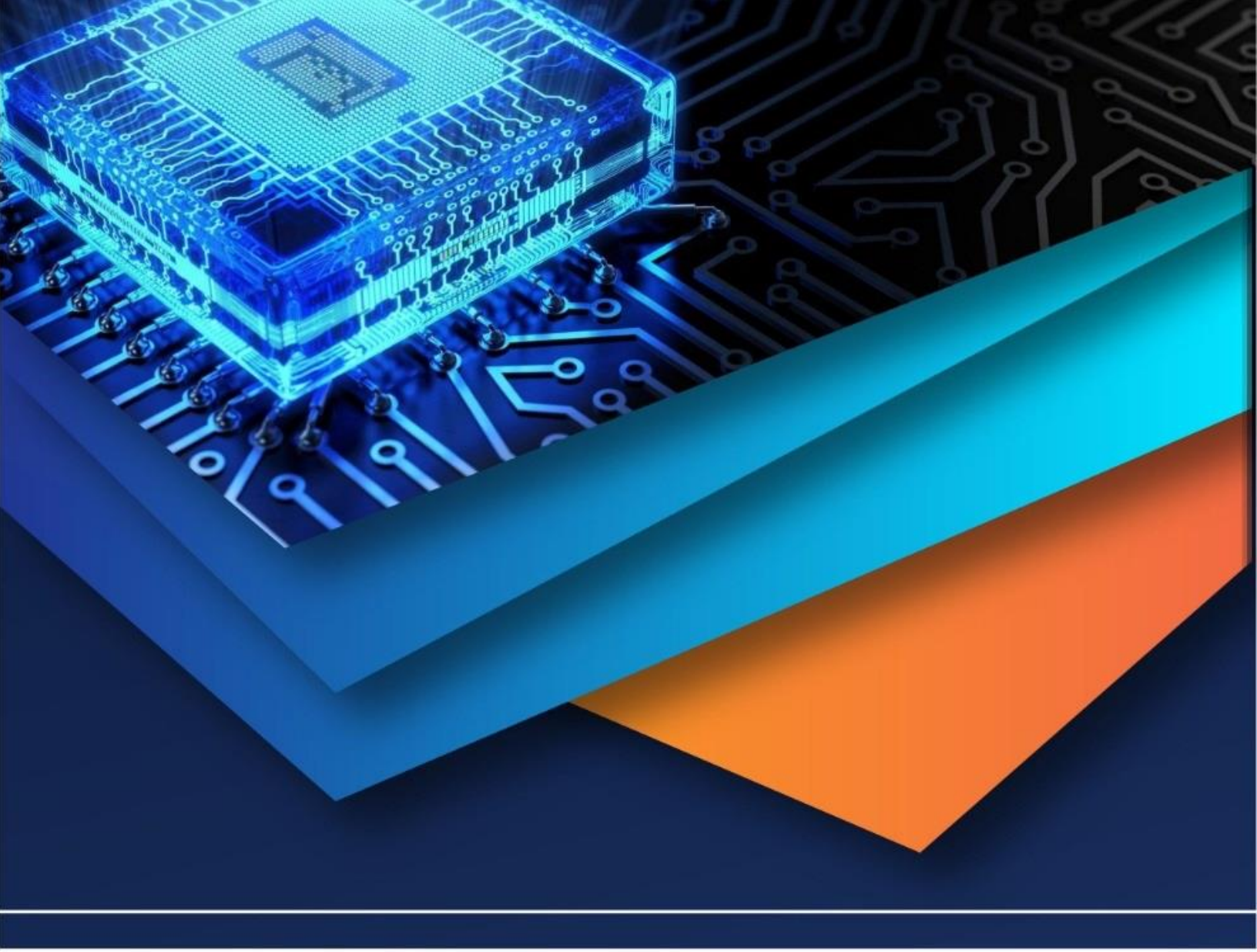
VII. FUTURE SCOPE

In order to effectively administer medicine drugs from the medicine dispenser, we follow the aforementioned processes. Moreover, remote configuration, additional programming, and any small operational issues can all be remotely managed by medical staff or any tech-savvy person. The performance of the dispenser was found to be satisfactory, appropriate for the needs, and successful in achieving its goal.

1) Hospital applications: The pillbox can be utilised in hospitals where there isn't enough staff to care for a large number of patients.
2) RTC, Buzzer, and many more applications can be used to optimise the product in a beneficial way
3) Installation of camera can be done to further ensure that the patient is in fact consuming the necessary medicines on time in absence or overlook by the medical attendees present

REFERENCES

[1] H.-W. Kuo, "Research and Implementation of Intelligent Medical Box,"M.S.thesis, Department of Electrical Engineering, I-Shou University, Kaohsiung, TW, 2009
[2] S.-C. Huang, H.-Y. Chang, Y.-C. Jhu and G.-Y. Chen, "The intelligent pillbox-design and implementation," in Proceedings of the IEEE International Conference on Consumer Electronics, May 26-28, Taiwan
[3] T.L. Hayes, J.M. Hunt, A. Adami and J.A. Kaye, "An electronic pillbox for continuous monitoring of medication adherence," in the processing of the 28th IEEE EMBS Annual International Conference, Aug. 30-Sept.3, 2006.
[4] Srividya C N, Munisahana M, Navyashree N S, Nikhil Gowda T K, "Autonomous All Time Medicine Counter for Medicine Self Dispensing", May-2019, www.ijraset.com, (IJRASET).
[5] Vishal Tank, Sushmita Warrier, Nishant Jakhiya, "Medicine Dispensing Machine Using Raspberry Pi and Arduino Controller", IEEE Conference on Emerging Devices and Smart Systems, March-2017.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)