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SMART MEDICINE REMINDER BOX

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ABSTRACT: This paper proposes the creation of an Arduino-based pill reminder to assist patients in taking their medications in the proper dose and at the appropriate time. The use of a smart medicine box can relieve an older family member of the obligation of ensuring that medicines are consumed correctly and on time. During the design process of this system two primary features were implemented: the first is a safety feature that will alert the patient, if they do not take their medication. The system's low cost is the second feature and this box will be linked to a caretaker's phone number, which will get a message, if the patient does not take his or her medicine.

KEYWORDS: Medicine Box, IR Sensor, Arduino , GSM Module, LCD display and Real time clock(RTC) module.

I. INTRODUCTION

In present era, most people were obsessed with their everyday routines. True, they place a greater priority on their work than on maintaining their health. Several illnesses, such as diabetes and high blood pressure, are now increasingly common for people aged 50 or above. For elderly people, remembering to take their medications on a regular basis becomes increasingly challenging. Younger people are also challenged with the same issue. Many members in our family, whether elderly, younger, or others, require constant care. However, we may not always be able to remind them of their medication dosages.

One of the most frequent cause for a method's failure to cure a patient is that the medicine is not taken at the appropriate time. It should be noticed that people's life spans have reduced and they have lost their basic memory power compared to previous generations. When the problem of older persons feeling helpless in self-care was identified, the Ambient Assisted Living (AAL) framework was created to help them survive independently [1]. Nowadays, the world and scientists are increasingly focusing on patient autonomy, producing innovative instruments that can assist them in being both autonomous and supervised at the same time.

We attempted to create a model of a medicinebox - a smart medicine reminder box containing several compartments for keeping different types of medicine such as tablets, capsules, and suppositories with prescribed administration schedules and is a modern day alternative to a standard pill box [2] - with the help of simple Arduino. It keeps track of when a patient should take his or her medication using a microcontroller [3]-[6]. It uses an LCD panel to show the time for the next medicine, and when that time comes, it generates messages in a loop, coupled with LED blinking to indicate which container to open. A sensor detects when the patient unlocks a container and resets the light, snooze the alarm. If the patient does not take the medicine, an SMS is sent to the caretaker or a registered phone number via the GSM Module.

II. RELATED WORK

Currently, there are a variety of medication systems in use. They are determined by many stages and concepts. The traditional pillbox, which cost roughly 200 rupees and contained seven boxes for each of the seven days of the week, was the cheapest. The user, on the other hand, was required to load the pills into the boxes on a weekly basis. When different medications are mixed together in the same box, the chances of making a mistake increase.

In [7], an intelligent pill box (IPB) was proposed; The IPB is based on the medicine bag system, and it sends a medication bag out of the box when it is time. The IPB will notify the carers via Skype if the patient does not remove the pharmaceutical bag. The IPB system increases patient-caregiver interaction, but it only works if you have access to



the internet.

In [8], an electronic pillbox called MedTracker was proposed; The moment at which each lid was opened or closed is recorded in the MedTracker and sent to a PC via Bluetooth. The MedTracker, on the other hand, does not have any reminder or confirmation functionalities. In [9], a Pill Box based on an MCS-51 micro-controller was proposed; that pill box can use a stepper motor to deliver medicine at a predetermined time, but there was no way to track when the patient actually took the medicine.

Abdallah and Fayyumi created a mobile application to help deaf and hard of hearing people with daily activities [10]. As a means of communication, they use the Arabic language. They used the idea that persons with disabilities communicate with regular people by selecting sign images. A "Smart Medicine Planner for Visually Impaired People"[11] has recently been proposed by Al-Haider et al. Their suggestion could be particularly useful for blind and elderly people who are trying to keep track of their daily prescription intake. The two essential components of their entire system are dispensing and alarming. The application uses Google Cloud to save the recorded voice and recognise it. To interact between their Smart medicine planner and voice box, they are using a Raspberry Pi3 with Bluetooth connectivity.

III. PROPOSED SYSTEM

The smart medicine box consists of a small box separated into numerous compartments, each with an IR sensor attached to it and an opening top. The box is wired to a real-time clock, an Arduino Uno microcontroller that interprets the activity and displays the pill details and time of ingestion on the box's LCD, and a GSM module that sends a message to the family physician or family members if the pill is not taken. The box is divided into multiple compartments, each containing a pill for a specific time of day. In rhythm with the pill intake timings, an electronic real-time clock with a factory-predetermined time interval is immediately engaged. The real-time clock will begin to beat, and when it approaches the prescribed time for pill ingestion, the buzzer will sound, and a message indicating which pill to take and when to take each pill will be displayed [12][13].

The medication box can be preloaded once a day by the patient or by someone assisting the patient, reducing or completely removing any potential uncertainty about when to take the recommended medicine and what dosages to take. If the person/user takes the pills, i.e. opens the lid, the IR Sensor attached to the lid will detect this and transmit an output to the Arduino, which will turn off the buzzer. This will be recorded in the log, indicating that the user has successfully taken his medication. If you do not take or refuse to take the medicine, the lid will not open and the buzzer will automatically stop and snooze after a preset time. If a person misses the drug again, the output is sent to the connected GSM module, which sends a message to that person to remind them that they missed the pill. And if the person forgets the pill again, a message will be sent to the family.

The block diagram of the proposed model, process flow the model are as shown in Fig.1 ,Fig. 2 respectively

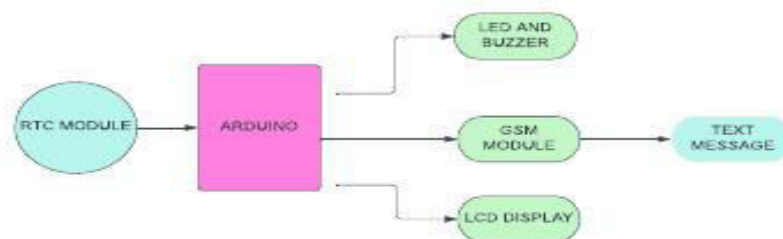


Fig.1. Block diagram of proposed system

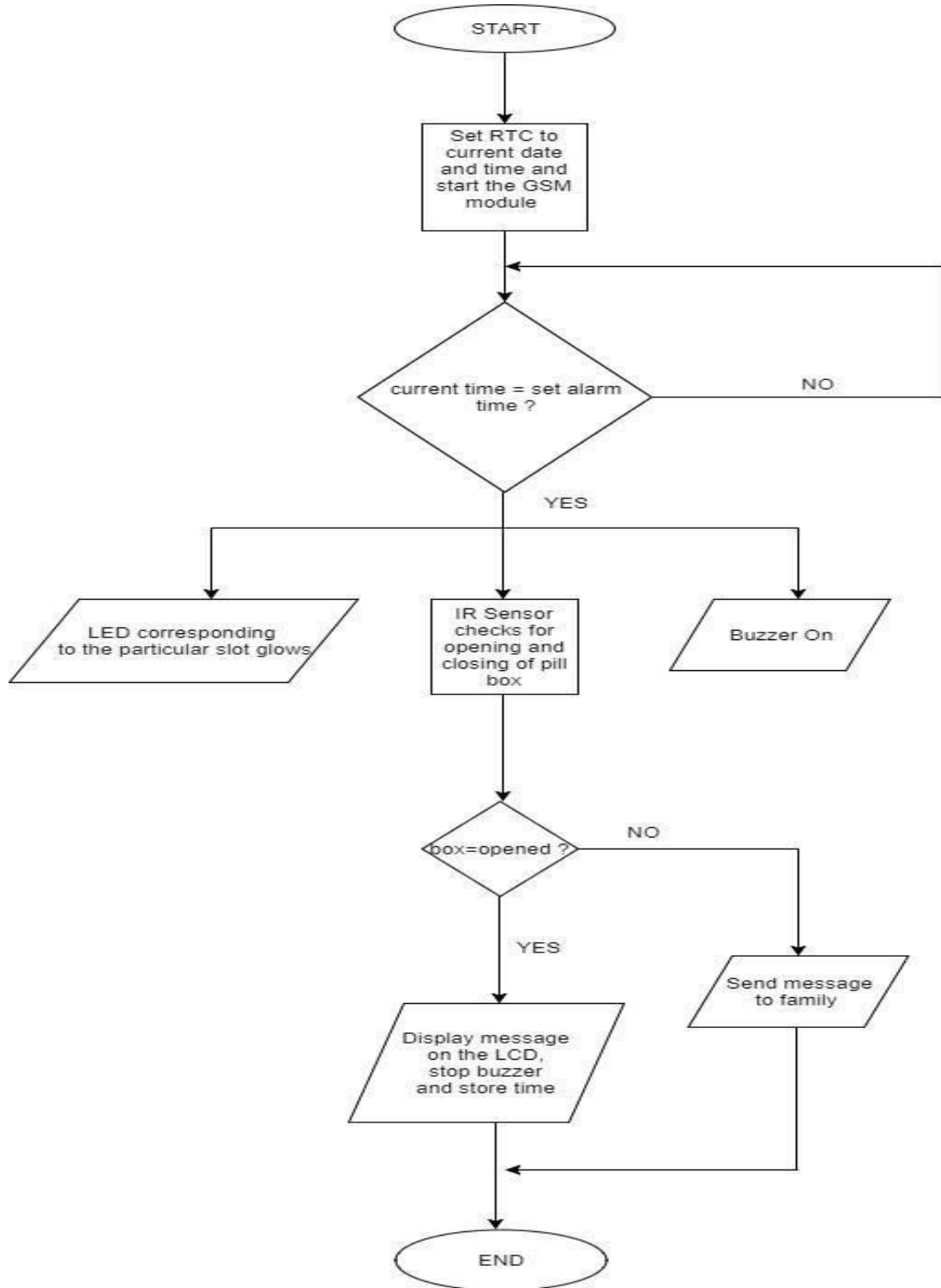
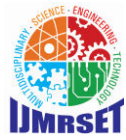


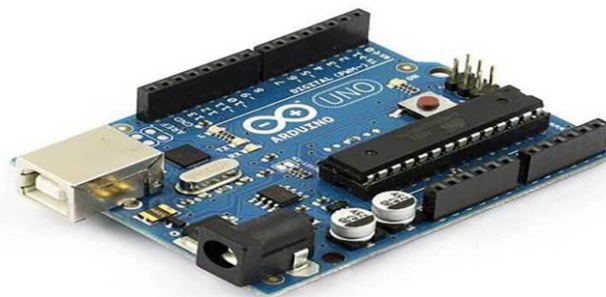
Fig.2.Process Flow Schematic



IV. COMPONENTS REQUIRED

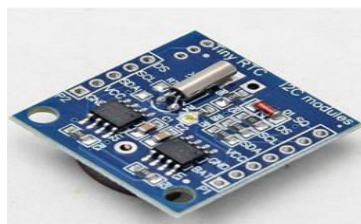
1.1 ARDUINO:

Arduino is an open source platform used to create electronics projects. Arduino is a physically programmable circuit board (often called a microcontroller) and software or IDE (Integrated Development) that runs on your computer and is used to write computer code and upload it to your physical board. Environment) consists of both. Arduino Uno is an extended microcontroller created by Arduino.cc, an open source gadget stage that depends on Atmega328. As electronics become smaller, adaptable, and unsightly, they are ready to achieve greater capacity. Microcontrollers are widely used in embedded frameworks to ensure that devices work according to our needs and requirements.



1.2 RTCModule:

The real-time clock module is the main module of the medicine box to achieve the important goals of the project. This is a simple module that does not require a lot of voltage to operate. That is, it only requires about 5 volts. The real-time clock (RTC) module uses the DS1307 to track the current year, month, day, and time. It includes a small lithium coin battery that powers the RTC and is accessible via the I2C protocol. The clock operates in 24-hour or 12-hour format with AM / PM display. Early in our project, specific times were set according to patient requirements. This means that if the user wants to set 10am as their morning intake time, it can be set using this module.



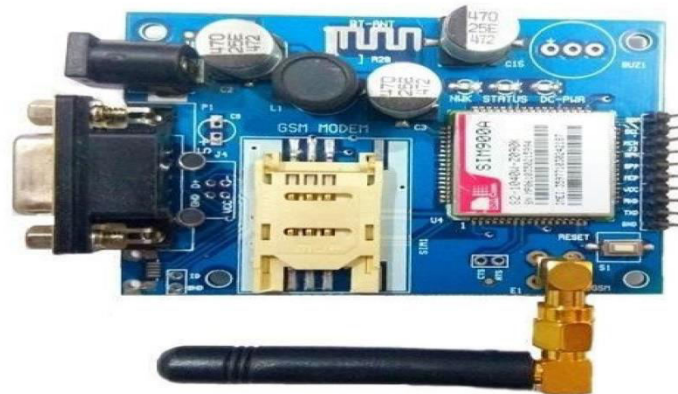
1.3 16x2LCD:

A liquid crystal display (LCD) is a flat panel electronic visual display that utilizes the optical modulation characteristics of liquid crystals. The liquid crystal does not emit light directly. Our project uses a 16x4 LCD to display information about the medicine box. The number of medicines in each subbox consumed when the alarm sounds.

1.4 GSM Module:

A GSM module or GPRS module is a chip or circuit used to establish communication between a mobile device or computing machine and a GSM or GPRS system. Here, the modem (modulator-demodulator) is an important part.

These modules consist of GSM modules or GPRS modems with power circuits and communication interfaces for computers (RS232, USB 2.0, etc.). The GSM modem can be a dedicated modem device with a serial, USB, or Bluetooth connection, or it can be a mobile phone that offers GSM modem functionality.



V. RESULTS AND DISCUSSION

In this project, a smart medicine box with vital parameter measurement is built and executed using the Internet of Things technique. It is a user-friendly project that can be easily handled without any particular training for handling the medicine box, and even elderly patients may use it with ease using the instructions provided on the LCD display. The major goal of this smart medicine box is to meet the needs of elderly persons who are experiencing memory loss. The alarm will remind them to take their prescriptions according to the specified schedule, which will be pre-programmed. This enables the patient to take the appropriate medications at the appropriate times, ensuring that the patient understands the treatment's benefits. The technology aids in the tracking of routine medical tasks and lowers the need for manual supervision. Results are shown in fig 3 and fig 4.

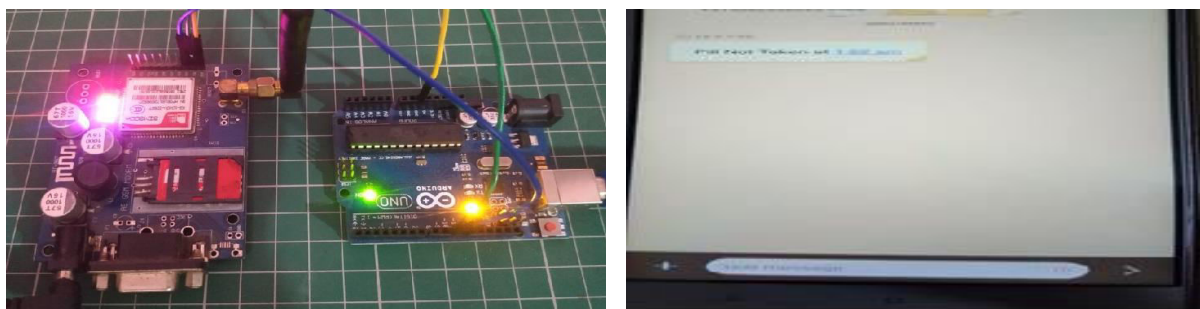


Fig.3: (a)LED Blink if medicine is taken Fig.4: (b) Message sent to care taker

VI.CONCLUSION AND FUTUREWORK

In this paper, Using simple electronics applications, a low-cost, usable model for a smart medicine reminder box has been built. To increase medication safety and reduce misunderstanding while giving tablets to elderly people. A buzzer and an LCD display have been fitted for easy detection and alert, ensuring that the person takes his medicine on time and in the correct quantity without the need for personalised supervision. The device also keeps track of when and where medications are taken, providing a handy database for future medical consultations. If medicines are not taken on time, family members or guardians are alerted. This simple device can be a useful choice for families with work-hour



compulsions or who feel forced to keep a mistress for a family member who is suffering from medical issue.

REFERENCES

1. G. Lavanya et al, "IoT Enabled Assisting Device for Seizures Monitoring ",IJRESM, vol. 2, Issue. 3, pp. 10-14, 2019.
2. Billingsley, Luanne, and Ann Carruth. "Use of technology to promote effective medication adherence." *The Journal of Continuing Education in Nursing* 46.8 (2015): 340-342.
3. G. Eason, B. Noble, and I.N. Sneddon Lewis, Kermit E., and Arthur S.Roberts Jr. "Automatic pill dispenser and method of administering medical pills." U.S. Patent No. 4,573,606. 4 Mar. 1986.
4. Shaw, Thomas J. "Automatic pill dispensing apparatus." U.S. Patent No.5,609,268. 11 Mar. 1997.
5. MacLaughlin, Eric J., et al. "Assessing medication adherence in theelderly." *Drugs & aging* 22.3 (2005): 231-255. 2005): 231-255.
6. Fang, Kerry Y., Anthony J. Maeder, and Heidi Bjering. "Current trends in electronic medication reminders for self care." *The Promise of New Technologies in an Age of New Health Challenges: Selected Papers from 5th Global Telehealth Conference 2016*, Auckland, New Zealand, 1-2 November 2016.
7. S.-C. Huang, H.-Y. Chang, Y.-C. Jhu and G.-Y. Chen, "The intelligent pill box-design and implementation," in proceedings of the IEEE International Conference on Consumer Electronics, May 26-28, Taiwan.
8. T.L. Hayes, J.M. Hunt, A. Adami and J.A. Kaye, "Anelectronic pillbox for continuous monitoring of medication adherence," in proceesings of the 28th IEEE EMBS Annual International Conference, Aug. 30-Sept. 3, 2006.
9. H.-W. Kuo, "Research and Implementation of Intelligent Medical Box, "M.S.thesis, Department of Electrical Engineering, I-Shou University, Kaohsiung, TW, 2009
10. E. E. Abdallah and E. Fayyoumi, "Assistive Technology forDeaf People Based on Android Platform", *Procedia - Procedia Comput. Sci.*, vol. 94, pp. 295-301, 2016.
11. A. J. Al-Haider, S. M. Al-Sharshani, H. S. Al-Sheraim, N.Subramanian, S. Al-Maadeed and M. z. Chaari, "Smart Medicine Planner for Visually Impaired People," 2020 IEEE International Conference on Informatics, IoT, and Enabling Technologies (ICIOT), Doha, Qatar, 2020, pp. 361-366, doi: 10.1109/ICIOT48696.2020.9089536.
12. Patel, Samir, et al. "Mobilizing your medications: an automated medication reminder application for mobile phones and hypertension medication adherence in a high-risk urban population." (2013): 630-639.
13. Bai, Ying-Wen, and Ting-HsuanKuo. "Medication adherence by using a hybrid automatic reminder machine." *Consumer Electronics (ICCE)*, 2016 IEEE International Conference on. IEEE, 2016.



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