AUTOMATIC MEDICINE REMAINDER USING ARDUINO

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***Abstract*- Medicines are necessary for maintaining health, preventing disease, and treating it. The materials distribution is a challenging task. Patients in remote areas and those involved in minor traffic accidents both require primary medications. We require continuous drug dispensing systems in such situations. The subsystems, including the RFID reader, GSM module, medicine dispenser, Inventor control, Wi-Fi module, and Servo motor, are controlled by an Arduino mega controller.**

***Key Words*- Arduino, Real time clock, Servomotor, Buzzer, LED**

1 INTRODUCTION:

Maintaining health requires innovation in the medical field. Similar conclusions have been reached regarding India, where timely availability to medications is blamed for the majority of deaths. The problem usually arises late at night when a person needs medicine quickly yet the pharmacies are closed or the medication may not be in stock [1]. In this situation, the Any Time Medicine Dispenser would be the best choice. However, there are many different kinds of medicine dispensers[2] available. They cannot be used for outdoor applications because the bulk of them are intended for home use.

2 LITERATURE SURVEY:

A Smart Medicine Dispenser (SMD) prototype is presented in this study. The major goal of this approach is to make it easier for patients [2], especially elderly, to take their prescriptions on schedule and without having to worry about forgetting a dose. It also lowers the danger of accidently overdosing or under dosing. Not accepting incorrect medicine use can result in major problems like disease, death, and delayed rehabilitation. Such issues could be resolved by the smart medicine dispenser (SMD) , which would inform and remind patients to take the right dose at the right time. Additionally, it facilitates direct communication between patients and careers by alerting the latter right away if a patient forgets to take a medication. To make things simpler for everyone, the product is made to ensure that the quantity and timing of the tablets to be administered can be managed and tracked using an app. The customer may monitor and control the scheduling and access information remotely thanks to SMD's touch screen, which can be accessible via a mobile application. This essay suggests employing a programmable drug dispenser to enhance the health recovery process. An electronic [3] pill dispenser with seven spherical compartments was created and manufactured by us. The PIC18F458 microcontroller, which manages all of the dispenser's functions, is used to implement the dispenser [4]. A dose of the drug is released when it is time to take it, and an auditory alarm is also produced. An SMS is delivered to a phone number if the patient [5] does not take the dosage as directed by the doctor. It is a laborious effort to supply medicine to people in remote locations, and there is also a need for primary treatments in the event of small accidents on roadways. In such circumstances, we need a continuous medication. The dispensing devices as a result, we have developed a concept for an Internet of things (IoT)-based automated medicine dispenser machine in this paper. This machine is a computerized medicine storage system that ensures the supply of the medication seven days a week, hence the name Any Time Medicine (ATM) machine. It also provides the medication in an emergency. We use an Arduino Mega controller to manage the subsystems in this Internet of Things-based automated medication dispenser, including the RFID reader, GSM module, medicine dispenser, Inventor control, Wi-Fi module, and Servo motor. The elderly must receive their medication on schedule. Users who take prescriptions without careful professional supervision are the target audience for automatic medication dispensers. The majority of families in our society nowadays are nuclear. Although it is natural for elderly people to want to maintain their independence, their offspring worry about it. The elderly occasionally forgets to take their medication on time, despite their best efforts. One strategy to assist them in effectively taking their medications is the automatic medication dispenser. It has become more and more necessary for people to choose a device that successfully manages their drugs as the expense of in-home medical care increases. The automatic medication dispenser accomplishes its goal.

3 Hardware Requirements

3.1 Arduino uno:

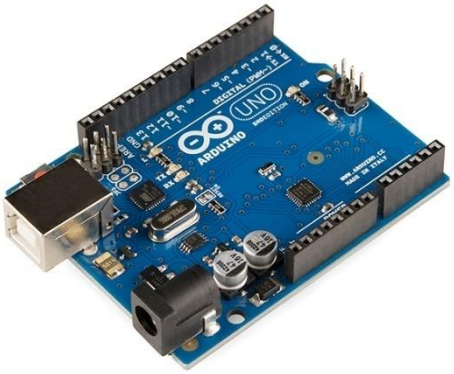


Fig: Arduino UNO

Open-source Arduino [6] is a platform for creating prototypes using straightforward hardware and software. The system consists of a microcontroller, a programmable circuit board, and ready-made software called Arduino IDE (Integrated Development Environment), which is used to create and upload computer code to the physical board.

3.2 Real Time Clock

Fig: Real Time Clock

A Real-Time Clock (RTC) is a type of computer clock that keeps track of the current time. It often takes the form of an integrated circuit. RTCs are present in practically every electronic equipment that requires maintaining precise time, despite the fact that the phrase is frequently used to refer to the components in personal computers, servers, and embedded systems.

Although it is possible to keep time without an RTC, doing so offers advantages such as low power consumption, freeing the main system for tasks that must be completed quickly and sometimes being more accurate than alternative techniques.

3.3 Servomotor

Fig: Servo motor

The servo motor is operated by sending a Pulse Width Modulated (PWM) signal to its control wire. Additionally, the red lead of the servo is given a 4.8V (preferably 5V) DC supply. The black lead of the servo is connected to Ground. The port P1 (P10) first pin of the AT89C51 microcontroller is set up as the output pin to deliver a control signal to the servo motor. To protect the signal from overload-related signal loss, the microcontroller's output is routed through a comparator IC (LM324) before being connected to the servo's control wire.

3.4 LCD

Fig: LCD

The LCD, also referred to as a Liquid Crystal Display, is particularly helpful for user interface and troubleshooting. The bulk of character-based LCDs are built on the Hitachi HD44780 controller or another compatible device. Currently, 1 Line, 2 Line, or 4 Line LCDs, which employ a single HD44780 controller and can support a maximum of 80 characters, are the most widely used LCDs on the market. More character-capable LCDs require two HD44780 controllers.

3.5Buzzer

Piezo Electric buzzers are solid-state devices that emit an audible signal when powered on. They are essentially made of piezo crystal. According to the fundamental characteristic of the Piezo crystal, when a voltage is applied to the crystal in a certain plane it begin to waver. A simple oscillator circuit is used to make these pulses audible.

Fig: BUZZER

3.6 Switch

Fig: Switch

In electronics engineering, a switch that fits this description is excellent. It has no current limit when it is turned on. It has an unlimited resistance when it is off. There is no voltage drop across the switch when it is in the ON position. Voltage limiting does not exist in the OFF state. There is no rise time or fall time when the state shifts. Without "bouncing" between them, change locations. Real switches fall short of this ideal because they have restrictions on the current and voltage they can manage, resistance, a finite switching period, and other features. Because it simplifies the system of equations that must be solved, the ideal switch is commonly used in circuit analysis. But this can lead to a less exact solution.

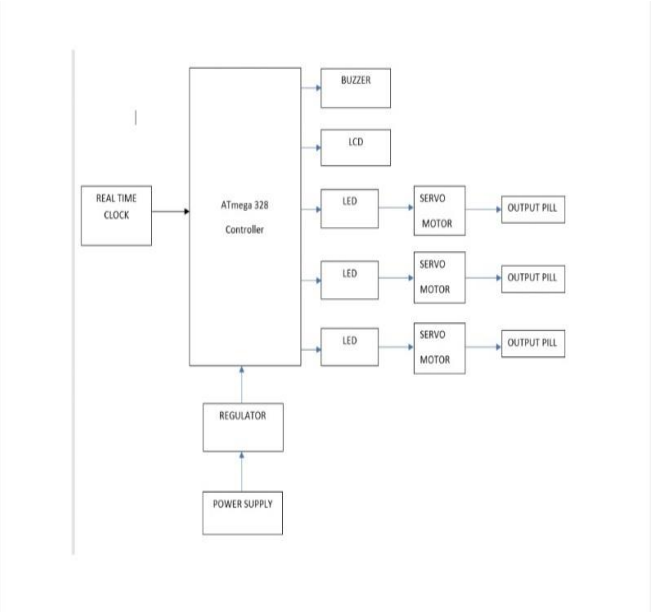
4. Proposed systems

These modules' main goal is to describe AMD's external peripherals and design in detail. In this study, an Android application that controls the complete system was created. Additionally, some information is provided on the medications that were taken along with their alerts and drug identification LEDs. A superb online database of users, prescriptions, and their alerts also helped with the project's design. The alarms can be edited and made remotely using a cell phone and an android application. In this case, drug dispensers may be helpful. Dispensers [8] come in many different shapes and sizes, but are all solely employed in the delivery of solid drugs. Most of them are just plain, with no reminders or further information.

This study recommends a medication dispenser with an alert feature that can dispense both solid and liquid drugs and is app-connected. One of the biggest problems the medical industry is dealing with is medication adherence [9]. Elderly people often forget to take their drugs on time, and those who take many medications [10] have a far higher risk of overdosing. Disasters, such

as fatalities or serious disabilities, could readily happen as a result. Therefore, it is evident that a solution is required and that the problem is widespread..

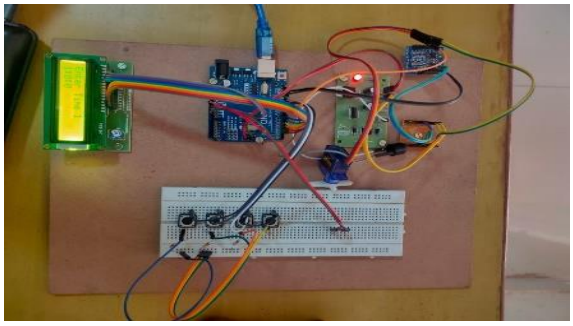
5. System-architecture



6. Software-implementation

Python: Python is an interpreted and object-oriented programming language which was made by Guido Van Rossum in the year of 1991. It reduces code as compared with other languages.

7. Working



It is controlled by an Arduino Mega board, which also controls a servo motor, a GSM phone, an RFID reader , a medicine dispenser, a Wi-Fi module, and other subsystems. After we have taken three pill boxes and finished the interface, the user will be able to set the time, date, and medication name using the source code. The alarm, the led, the pill box, and the alarm will all blink at the time the user has set. The alarm will also sound. The patient can retake their medication 10 to 15 minutes after neglecting to do so by using the snooze function. The technology will vibrate a certain box and raise an alarm if the patient is blind. The vibration will be felt by the blind patient, who will only take medication from that box and use a stepper motor to lock the other one.

6. Results

The medication dispensing system provides an affordable, adaptable, straightforward, and durable alternative for providing basic healthcare everywhere. With little hardware and software modifications, the machine may be tailored to any type of terrain or environment. This machine will be upgraded to include an intelligent medicine unit that, when the quantity of medicine strips drops below a predetermined level, sends a refill notice message to the closest pharmacy.

7. Conclusions

A variety of pill and capsule sizes can be used with the Automatic Medicine Dispenser without any issues. The dispenser may be configured to distribute a range of pharmaceuticals for a number of days, it has been found. Up to six alarms can be sent out by it each day. It is programmed so that the dispenser can dynamically change how frequently and how many tablets need to be picked up, depending on the situation. Anyone can operate the machine because it is so simple to use, and since it is also not very expensive, the cost is significantly cheaper. Although reasonably easy, programming the controller takes some time. Dispensers that automatically deliver medications work well.

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