

Automatic Medicine Pill Dispenser for Covid-19 Patients Using IOT

Sayali Gaikwad, Gauri Kamble, Mangal Rahinj, Preeti Umbarkar, Prof. Sujata Girawale

Department of Electronics and Telecommunication Engineering,
Genba Sopanrao Moze College of Engineering, Balewadi
Pune

Abstract-The Medicine Dispenser is a machine which dispenses the medicine based on the authentication of the user by using the user name and the password given to the user by the administrator of the machine. This machine will dispense medicine according to the user prescription provided by the user's doctor and also the number of medicine is also determined by the user's choice. In this medicine dispenser the money is handled through the digital points stored in the user's card which is given by the administrator and also user can restore the points by taking to the administrator of the card and use his identification to add the digital points to the card. The main goal of the dispensing machine is to provide the medicine to the users 24/7 so it can help the village people who are far away from the hospital or the clinic to buy the medicine and also it can be installed like an ATM machine so it is easy to use by the people even though if they cannot read and write. The medicine can be replaced by the administrator of the machine by time to time based on the expiration date or if it is empty the machine will alarm the administrator to refill the machine through SMS or telecom messenger.

Keywords: Internet of Things (IoT), RFID (Radio frequency identification), Arduino Mega, Nodemcu.

I. INTRODUCTION

The medicine dispensing machine is using the card which is used to store the data of the users like their user name, password, prescription of the user etc. So here we are using RFID tag which is used for the identification of the user and this RFID tag uses radio frequency identification devices for identification and tracking of the user records like login and the amount and the medicine taken by the user to store it as a reference in the future. The RFID tag system includes the tag itself, a read/write device, and a host system application for data collection, processing, and transmission.

The medicine dispenser uses Arduino mega as a main system controller to attach all the module to perform their respective function and also for the machine we require more pins so the controller we selected is Arduino mega. To this controller mainly there are 4 modules connected to it: there are keypad, nodemcu, LCD display, repeaters.

The medicine plays an important role in everyday life so the Medicine dispenser also helps in the rural village where there is no hospital or clinic; there we can install these medicine dispenser so it can help the people and since it is simple to use there will be no problem in teaching to the people who are illiterate and also there are security measures so that the user cannot obtain more than the medicine needed; then that of prescribed by the doctor so there will be no harm to the user. The LCD module will let the user to see all the prescription that has been given to the user; these numbers can be entered with the keypad located in the system.

II. LITERATURE SURVEY

Authors have proposed an advanced pill dispenser, in which only an authenticated person alone is allowed to get access to it. It is done by using an RFID module. Also proposed the dispenser unit which has database information about the medicine and provides a human interface.

But it doesn't make sure about the genuineness in taking medicines. The system doesn't provide any tracking methods.

III. PROBLEM STATEMENT

To design and develop a dispensing machine which uses RFID tag as an authorization card and display the user data with prescription.

The system that will send notification to the administrator if the medicine is needed to be refilled.

IV. PROPOSED SYSTEM

RFID tag system with an Arduino mega board that uses LCD, nodemcu, RFID and Wi-Fi Module. Embedded system which will provide all the function needed to fulfill the goal to creating the medicine dispenser.

V. DESIGN AND METHODOLOGY

The users will first insert the health care card in this case the RFID tag into the system. The system will scan the card using RFID reader through radio identification and displays user name and ask for the password for the further continues. Then the system will read the card data and display the prescription and will ask for user's input.

The users have to select the prescribed medicine from the medicine displayed on the LCD and also have to select the number of medicine required. Once the input has been taken the system will check the number of tablet is present or not. If it does, system will check the users balance and will dispense the medicine and if the user does not have required amount it will display a message stating insufficient balance and ask the user to recharge the card.

1. User Authentication:

In this process the user authentication is done by scanning the RFID tag with the RFID reader of the system and entering the password given to the user if the password is correct then the authentication is complete if not the machine will tell user to check the password.

2. Medicine Dispensing:

If the authentication is complete then the user may select the medicine required and also the number of medicine required for the machine to dispense.

3. Database Updating:

After the pill has been dispensed the database of the users digital points and the number of pill stock in the database will be updated.

4. Inventory Control:

Controlling the number of pills present is critical to functioning of machine. If the medicine gets over, the system will send notification to refill it.

A flowchart is a type of diagram that represents an algorithm, workflow or process. Flowchart can also be defined as a diagrammatic representation of an algorithm (step by step approach to solve a task).

At first the health care which is RFID card needs to be scanned. Then the system will ask the user to enter the password. If the user is authenticated, then the system will display the prescription of that user i.e. the list of medicines.

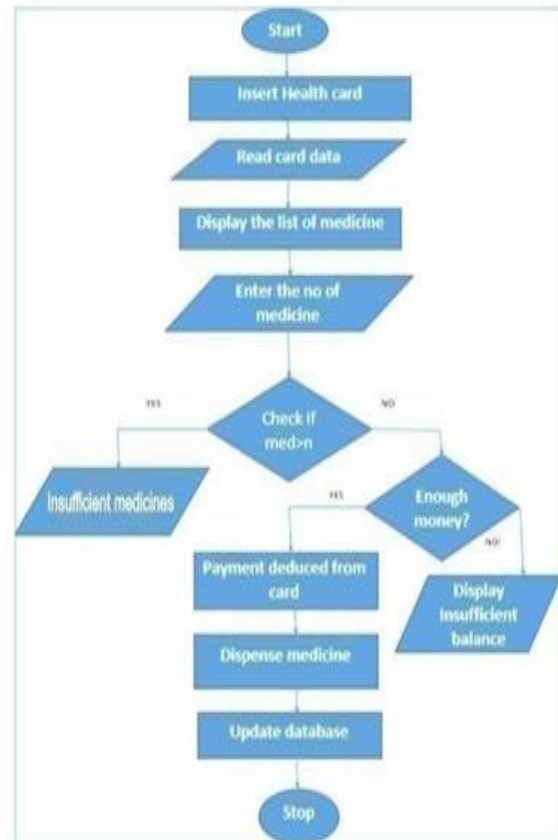


Fig 1. Flowchart of the ATM system.

The user has to select the medicine from the list of medicine displayed and has to select the number of medicine required for the user then the medicine is dispensed if the medicine is less than the message is showed to the user the medicine is not available and the message is sent to the administrator.

After that the database of the user digital points is updated and the balance message is sent to the user.

VI. SOFTWARE COMPONENTS

Embedded C- Arduino Software:

The Arduino integrated development environment (IDE) (figure 4.4.1) is a cross-platform application for Windows, macOS, Linux that is written in the programming language Java. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards. The Arduino IDE supports the languages C and C++ using special rules of code structuring.

VII. IMPLEMENTATION

The steps involved in assembling all the devices and implementing the project:

Step 1: Configuring the Programmable Devices:

The module we are using are the Arduino mega as the main controller module and this is connected by LCD display for the user interaction, keypad for entering the user requirements relay which is used for depending the medicine the message is sent by using Nodemcu module by using telegram to the authority of the system RFID reader is to read the care card to give the authentication to the user.

Step 2: Setting up code in Arduino Mega:

The RFID module code should be dumped to the Arduino Mega board which is installed in the patient section.

Step 3: Integrating the hardware modules:

Arduino Mega should be connected to all the module like RFID reader, Wi-Fi module, LCD and relay.

Step 4: Connecting the NodeMcu module:

The message is sent through using the Nodemcu module which is connected to the mega module.

Step 5: Powering up all the devices:

In this system it is connected to the power supply and also voltage converter which convert the voltage to 5v-2.5v power supply. By using this power supply the system can work without any problem.

1. PSEUDO CODE:

- Start
- Initialization of LCD, Wi-Fi module, Nodemcu, Relay, FID Reader
- Define Card, Phone Number, Tablet, Balance
- Store Prescription
- Initial Display

VIII. SYSTEM ARCHITECTURE

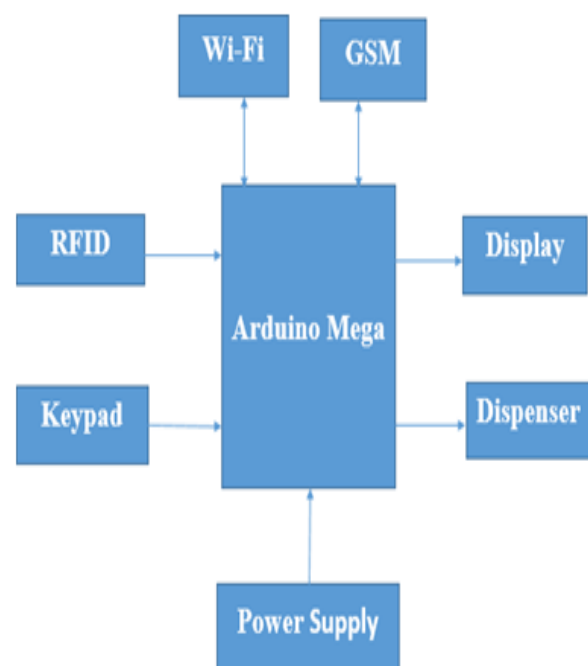


Fig 2. Block diagram of the model.

The system has microcontroller Arduino mega which is an 8-bit RISK microcontroller board which controls the functionality of the entire component in the system.

The system relates to the hardware components like RFID module, Keypad module, LCD module, Nodemcu module, Wi-Fi module and Dispense system which is used to dispense the medicine.

As we can see in the figure 5 the block diagram shows all the modules connected to the main controller by which we can see the overall view of the system this conceptual model is used as a base to construct the main system.

IX. ADVANTAGES

- It is very much portable that it can be installed in very less area. No Individual person needed for maintenance.
- Easy to use and Provides 24/7 medicine facility.
- Since online transaction involved no fear of robbery.
- The dispenser will dispense the medicine automatically for that disease.
- The message system is automatic so the refill of the system message is directly sent to the care taker of the system.

X. DISADVANTAGES

- Intelligent medical dispenser will only deliver tablets but no syrup or liquid medicines.
- The system cannot dispense more than one medicine at the given time.

XI. CONCLUSION

The medical dispenser offers a flexible and simple solution for extending basic healthcare to all places including remote places, at a very less cost. The machine will dispense prescribed medicine.

The machine adds an intelligent medicine unit, which sends a refill notification message to the authorization the system given to the person to refill the medicine pills.

The medical dispenser is technically feasible to all the peoples. The system also provides the required user authentication for the user by using RFID tag and the RFID reader.

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