

AUTOMATIC MEDICINE VENDING SYSTEM- MEDICAL ATM

¹M Sangeetha, ²T.V Janardhana rao, ³C H S Gowri

Department of Electronics & Communication Engineering
BVC Engineering College, Odalarevu

ABSTRACT

Medicine plays an important role in human's life for every situation. An automated medical system is introduced to reduce the man power time and energy. It is similar to an ATM through which we get the required money at any time & any place. The same system is followed for the pharmaceuticals also. Medicines for B.P, diabetics, cold, fever, headache, and first aid medicines like bandage, cotton, ointments, and other routinely used tablets can be obtained.

When RFID card is inserted, the details of the particular user are read by the RFID reader and displayed. After the identification of the valid person, list of medicines will be displayed on the TFT display, then user selects the required medicines by entering the corresponding number of selected medicines by using the keypad. After entering the required list, the amount will be calculated according to the medicine and their quantity. The amount will be deducted from the RFID card and immediately the transaction details will be sent through GSM to the user. After payment deduction the selected medicine are delivered automatically from the system. For this delivery system the arduino controller uses a slider arrangement with the help of servo motors which provide rotational mechanism.

Keywords: Arduino Mega 2560, TFT, RFID Reader & Cards, GSM, servo motors

1. INTRODUCTION

Time plays a crucial role in every human life. As technology is rapidly being increasing, man power is decreasing day by day.

To reduce the human efforts number of electronic devices and gadgets were developed. One such system is an electronic ATM machine ATM is the one stop integrated electronic machine which provide money anytime and anywhere. It is a convenient, faster and safest with drawl at anytime and any place. With this (electronic ATM) concept in view, another system regarding health monitoring is developed. Before going on to health monitoring a simple step to put over before developing a major concept is implemented in this proposed system i.e. an ATM machine which yields the pharmaceuticals which is the proposal towards medical domain where health is the main concern for any human being before money. So a medical ATM is established where instead of money, medicines will be delivered.

The main motive of creating such ATM is to use them at places like hostels, airports, railways and rural areas where people can go for any emergency required tablets for fever, vomiting or any first aid requirements like ointments,

cotton, bandages etc..., or common used tablets for b.p, sugar etc., .

1.1 OBJECTIVES INVOLVED IN THIS SYSTEM

1. User identification.
2. Selection of requirements.
3. e-payment
4. Delivery using slider arrangement and servo controlled mechanism.

2. HARDWARE IMPLEMENTATION

2.1 BLOCK DIAGRAM

The block diagram shows the main input and output components interfaced to the Arduino microcontroller. Those are TFT(Thin Film Transistor)Display system, GSM modem, phone, keypad, servo motor ,RFID card and rfid card reader.

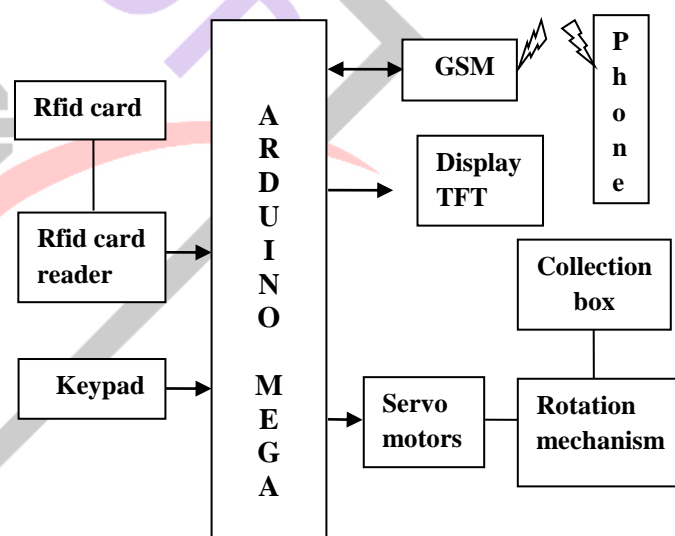


Fig 1: Block diagram of this system.

2.1.1 ARDUINO MICRO CONTROLLER

Arduino is an open source prototype platform which is easy to use as number of required modules can be directly interfaced on to the board and has an understandable software language. The Arduino forms the main heart of the system, the purpose of using this controller is due to the fact that it reduces the interfacing components as it has number of necessary features inbuilt in it. In this system, the main modules which are to be interfaced to the controller are RFID card reader, keypad, TFT display, GSM and servo motor.

2.1.2 TFT (THIN FILM TRANSISTOR) DISPLAY

A thin film transistor liquid crystal display (TFT-LCD) is a technology which is used in LCD monitor and television displays. TFT technology can be used to give one of the clearest pictures of any flat screen display and it uses much less electricity than older screens.

In this system, the TFT LCD displays the list of pharmaceuticals so that the user will be able to select his/her required medicines by using the keypad.



Fig2: TFT Display

2.1.3. GSM MODULE SIM900A.

This GSM modem is a highly flexible plug and play quad band SIM900A GSM modem for direct and easy integration to RS232 applications. It Supports features like Voice, SMS, Data/Fax, GPRS and integrated TCP/IP stack. To be connected to a cellular network, the shield requires a SIM card provided by a network provider. Here through this GSM, the details of the amount which are being detected in the RFID card will be sent to the user. Also the available balance will be known and recharge facility for the card will also be provided through a network.

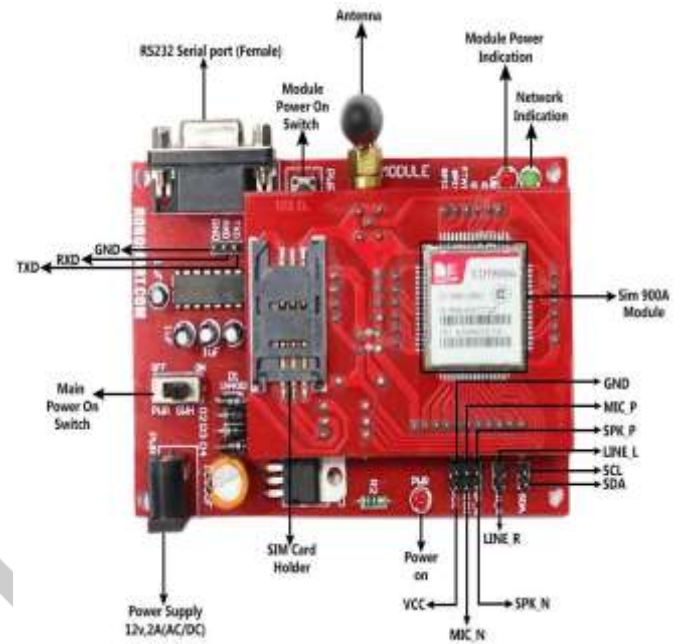


Fig3: GSM sim900A

2.1.4. RADIO FREQUENCY IDENTIFICATION

RFID (Radio Frequency Identification) is an automatic identification method, based on the concept of storing the data and remotely retrieving data using devices called RFID tags or transponders which contain silicon chips and antennas to detect the transmitter signal.

The RFID here is used to read the user id and enable the service to the particular user. If the identity does not match then automatically message will be sent to the user that someone has accessed your id number.

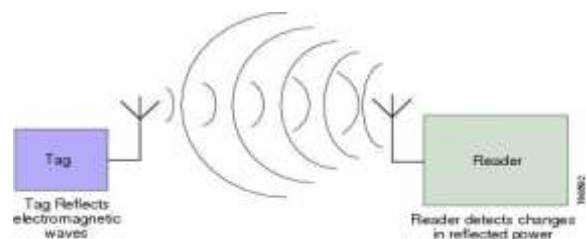


Fig 4:RFID card and reader

2.1.5. SERVO MOTORS

This is nothing but a simple electrical motor, controlled with the help of servo mechanism. It pulls the object with a high precision. Interfacing of the servo motors in this system is to provide the rotation mechanism in order to get the required tablets out.



Fig 5: servo motor

2.2 MECHANISM INVOLVED

The mechanism involved in this system is a rotational mechanism based on the movements of servo motors. Two positional rotation servos are used in this system where one takes half part rotation and other takes care of remaining half part of rotation so total rotational angle will be 360. The individual medicines from a strip are placed in the divided racks in a circular plate and number of different plates according to number of items taken is placed horizontally. Below these circular plates, servo motors are placed to slide out the bases of the required rack to get opened.

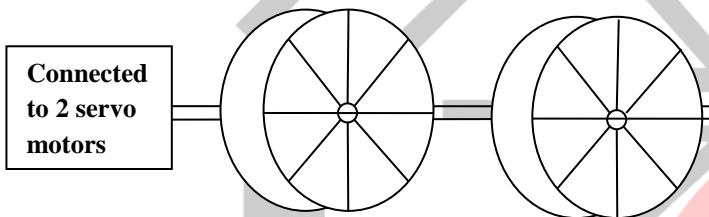
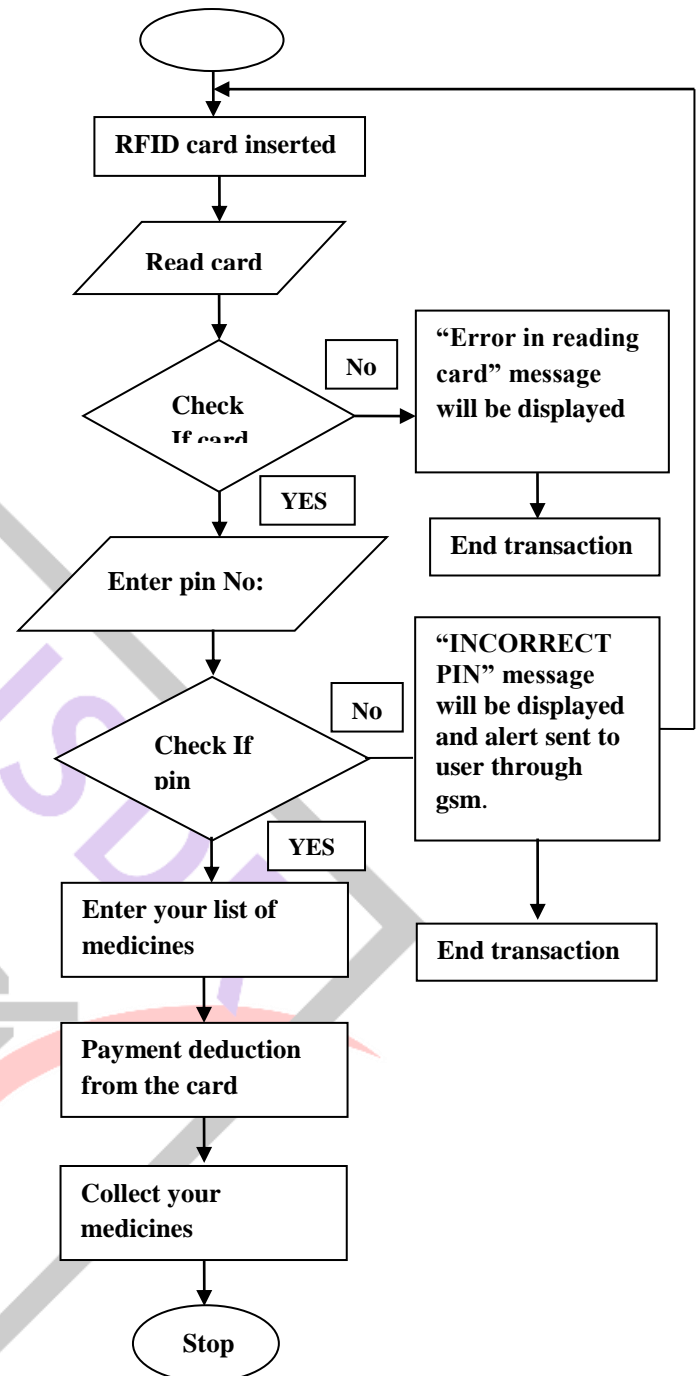


Fig 6: Cross sectional view of the circular plates

The two servo motors take care of these circular plates. When a certain angle is rotated and stopped, the outdoor of the plate of that particular angle will be pulled by another servo placed at below of this plate just as how a piece of cake is cut from a round cake and pulled out from it. So as the below servo pulls the base of that particular plate, it gets opened and the item falls down on another plate which is then slide over the collection box as how in airport the luggage bags after checking will slide over from one side to other side.

3. FLOWCHART



4. APPLICATION AREAS

1. Its main application area will be healthcare field. It will help in increasing the network of good organizations in worldwide and in providing the medical facility at the doorstep to the required one.
2. It will be useful in providing medical facilities in busy areas such as Railway Stations, Airports, markets etc.
3. Provide facilities to people during their journey as this can be installed in the aircrafts, rails and ships.
4. This system can be used by the defense organization such as military, air force etc.
5. It will help rural India to get better medical facilities at much lower costs.

5. FUTURE SCOPE

1. By implementing medical ATM, simple medical problems will be diagnosed with an easy reach. This system can be further improved to diagnose the health problem also. A central platform can be provided for patients to interact with specialists of fields through video conferencing i.e. to provide a health ATM service.

2. One more development is that to provide automated e-emergency diagnosis and pharmacy for patients which can be meant that at the health ATM, when a card being inserted the whole body of the user will be scanned and the problem will be identified and rectification suggestions will be given. If it is unable to identify, then a specialist will be connected through video conference.

6. RESULT



Fig 7: Construction view of this system

7. CONCLUSION

Automated medical ATM system plays its major role in hostel areas, railway platforms, airports, and rural areas. Implementation of this system reduces man power 24 hours availability service and also reduces time consumption.

REFERENCES

- [1] Albert jaison, Anu simon, "Robotic pill dispenser", IOSR journal of pharmacy and biological science (IOSR-JPBS), e-ISSN: 2278-3008, P-ISSN:2319:7676. Volume 9, issue 4 ver.V (july-aug 2014), pp 60-63.
- [2] I'll keep an Eye on You: Home Robot Companion for Elderly People with Cognitive Impairment By H.-M. Gross, Ch. Schroeter, S. MuellerM. Volkhardt, E. Einhorn ,A. Bley, T.LangnerCh.Martin, M. Merten..
- [3] Smart Medication Dispenser: Design, Architecture and Implementation- Pei-Hsuan Tsai, Tsung-Yen Chen, Chi-Ren Yu, Chi-Sheng Shih, Member, IEEE, and Jane W. S. Liu, Fellow, IEEE.
- [4] Dhanush j.Nair, Sunny nahar, " ATM transactions:A new time based approach research paper ", International journal of science, engineering,and technology research(IJSETR),volume 4,issue,6,june 2015, ISSN:2278-7798.
- [5] DeClaris, J.-W.; D-ATM, a working example of healthcare interoperability: From dirt path to Implications, Engineering Management, IEEE Transactions on ,Volume: 46 , Issue: 3, Year: 2009 , Page(s): 4643 – 4645.
- [6] Paul, D.L.; Pearlson, K.E.; McDaniel, R.R., Jr.;Assessing technological barriers to telemedicine: technology-management.
- [7]http://en.wikipedia.org/wiki/Automated_teller_machine