Anytime Medicine Vending Machine

G Adithya Varaprasad Reddy [#1], A Suman Kumar Reddy [#2]

[#1]M Tech Scholar, *Dept. of ECE, PBR Visvodaya Institute of Technology& Science, Kavali, SPSR   Nellore(D.T), A.P*
[#2]*Associate Professor, Dept. of ECE, PBR Visvodaya Institute of Technology& Science, Kavali, SPSR Nellore(D.T),A.P*

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Abstract - *These days in this fastly moving world, appliances that are automatic are being preferred. This is the biggest advantage of our project. Automated dispensing machines decentralized medication distribution systems that provide computer-controlled storage, dispensing, and tracking of medicines are recommended together as a potential mechanism to enhance efficiency and patient safety, and they are now widely utilized in many hospitals. There is no doubt that these medicine vending machines can improve the efficiency of medication distribution, but their capacity to decrease medication errors is controversial and it depends on many factors, including how users can design and implement these systems. From this concept, we conclude that the automatic medicine vending machine is technically feasible to the peoples. It gives the availability of medicines all the time, also in rural areas. It is very helpful; it gives ease of access also. It is sales person-less service that is based on a smart card.*

Keywords: *Automated dispensing, vending machine, smart card.*

1. INTRODUCTION

Vending machines have been used to serve the wide clientele with the variety of products handling from green grocery to processed products; the typical example is the snack vending machine that can be used for buying and selling of different kinds of snacks. If the vending machine is fully automated, the transactions can be done by the customer without any manual in the intervention or time restrictions. Some Vending machines accept cash in the currency forms only while the others accept both the cash and the credit cards for the electronic transactions. If the vending machines have mobility, they can be moved to the new places and they will continue delivering the services as usual. There is no cashier, they give the clients the free choice to purchase the products at any time of the day, and you can shop for your

intended product on a 24-hour basis, throughout the year. An automatic medicine vending machine with self-contained on-site medicines dispensing mechanism and a storage facility for the plurality of medicines that can be dispensed based on the user requirement. Major components of the machine include stepper motors for dispensing the medication, large storage space to store the pills, an inventory monitoring system to keep track of the storage.

2. MOTIVATION TOWARDS THE WORK

Diagnosis is always a concern for the people living in rural areas and for those traveling long distances in trains or buses. At the same time, medicine availability also has a major impact excluding the factor about a complete cure. The absence of 24 hours of medical providers in rural areas and the absence of medicines in bus stands, railway stations, and highways motivated us towards this work.

The aim of this prototype is that temporary relief is to be given out that can give people a better chance of resisting the health from withdrawing before they are able to reach the doctor.

3. EXISTIG SYSTEM

The problem arises when the need for some medicine is urgent and drug stores aren't open or drug isn't available, especially during already dark. In remote areas, rural areas, and places where public turnover is a smaller amount, the supply of medicines within the patient's reach may be a critical issue. These are some of the main problems that are being faced by the society in the present scenario. Degrees of social status are closely linked to health inequalities. Those with poor health tend to fall under poverty and therefore the poor tend to possess

poor health. According to the planet Health Organization, within countries, those of lower socioeconomic strata have the worst health outcomes. Health also appears to possess a robust social component linking it to education and access to information.

In terms of health, poverty includes low income, low education, social exclusion, and environmental decay. The poor within most countries are trapped in a cycle in which poverty breeds ill health and ill health leads to poverty. Our project although may not be an out of the box idea in its entirety, it still could prove to be useful. Especially in developing countries like India where there are many people who are unable to avail medicines. They are Band-Aids for minor abrasions and cuts, Paracetamol for reducing fever, Vicks Action 500 for the common cold and ORS packets for dehydration and other problems involving loss of fluids in the body.

Fig. 1 Existing System

4. PROPOSED SYSTEM

In order to overcome the disadvantages of the existing method this automatic Medical Vending Machine using Arduino ATMega 2560 is introducedto develop a system to deliver medicine 24x7 to the people. The machine can deliver mainly Over the Counter (OTC) drugs, pain killer etc., so it will be very useful to the society.

Medicine dispensing process is done in four steps.

1. Authentication of registered user.

2. Selection of required medicine.

3. Payment.

4. Collection of requested medicine

5. RELATED WORK

- First the user needs to register in a particular authorized centre with prescribed drugs.
- Then user will be provided with RFID Tag and password.
- During transaction user must first swipe the card Request for the required medicine should be made by the user by scrolling through the menu displayed on the screen.
- The machine will search for the requested medicine in dispenser.
- If the medicine is present in the machine, then the payment has to be made for the requested/available quantity of the medicine.
- Finally, the medicine is collected

A. HARDWARE REQUIREMENTS:

- Microcontroller board(ARDUINO)
- Keypad
- RFID reader
- LCD display
- GSM modem
- Stepper motors

B. SOFTWARE REQUIREMENTS:

- Arduino IDE
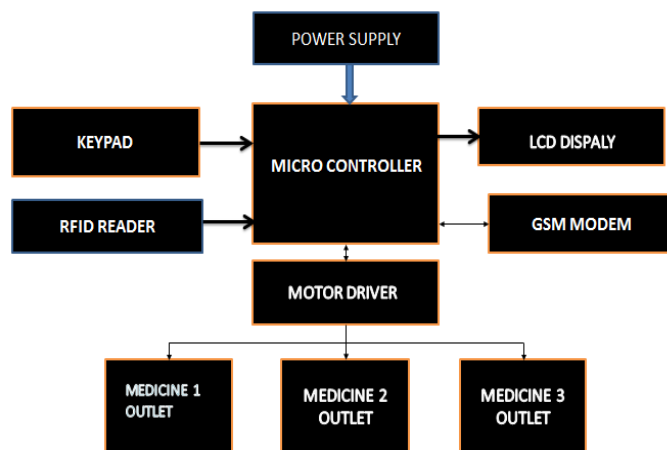- Embedded c-language

C. BLOCK DIAGRAM:

Fig. 2 Block diagram of proposed system

D. COMPONENT DESCRIPTION:

ARDUINO MEGA:

- The Arduino Mega is a microcontroller board based on the ATmega2560.
- It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 Analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.
- It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Fig. 3 Arduino MEGA

KEYPAD:

The hex keypad is a peripheral that connects to the DE2 through JP1 or JP2 via a 40-pin ribbon cable. It has 16 buttons in a 4 by 4 grid, labeled with the hexadecimal digits 0 to F.

Fig. 4 KEYPAD

RFID READER:

RFID (Radio frequency identification) is a form of wireless communication that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency portion of the electromagnetic spectrum to uniquely identify an object, animal or person.

Fig. 5 RFID READER

LCD DISPLAY:

- LCD display module with BLUE Backlight
- Operate with 5V DC
- SIZE : 20x4 (4 Rows and 20 Characters Per Row)
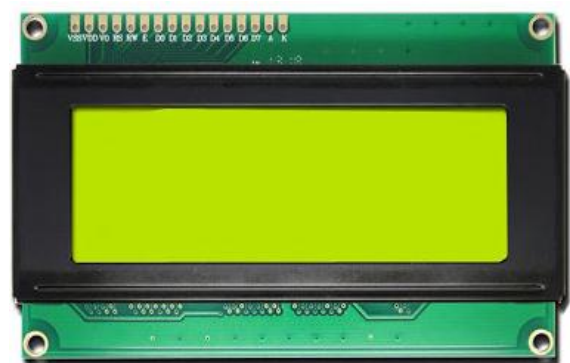- Can display 4-lines X 20-characters wide viewing angle and high contrast.

Fig. 6 20*4 LCD DISPLAY

GSM MODULE:

GSM means global system for mobile which is a mobile communication modem. It is mainly used in mobile communication for data transfer throughout

the world. A GSM modem is a special type of modem that accepts a SIM card, and which operates over registering to a mobile operator, just like our mobile phone. GSM modem devices works in full duplex mode for sending and receiving SMS. It is an open cellular technology used for communicating mobile voice and data services which operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.
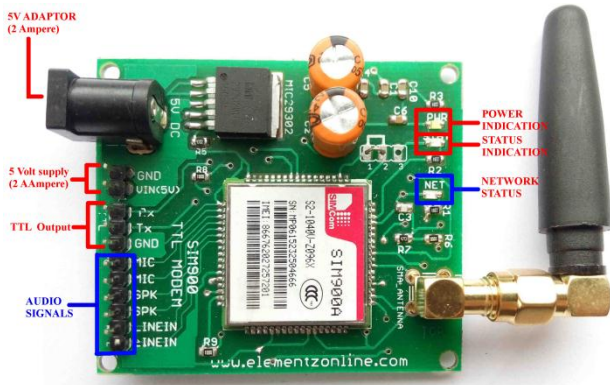

Fig. 7 GSM Module

STEPPER MOTOR:

- Step angle :1.8 °per step ,Holding torque - 46Kg/Cm,(4.6Nm) Motor Shaft Length - 31mm, Shaft Dia- 12mm, Rated Current 4Amp, Rated Voltage 4.16V, 4 wire, Stepper motor is compatible with all 2-phase drivers,
- Motor mounting frame Size:- 86mm x 86mm, Mounting direction - both horizontal & vertical
- Use in positioning and torque for 3D printers, DIY CNC, XY plotters , Industrial automation, robotics, Solar platform position, 3D Printers, Monitor Equipment, Medical Machinery, Textile Machinery, robotics automation , laboratory equipment Packaging Machinery more.

Fig. 8 STEPPER MOTOR

5.1 WORKING ALGORITHM

- Automatic medicine vending machine uses an Arduino board and one LCD display, RFID reader, GSM MOTOR and 3 Motors.
- The mechanical part has 3 components for storing three different types of medicine. The display was coded to show the different types of tablets present in it.
- Whenever user presses the required tablet button, the motor rotates and dispenses the medicine from it.
- If medicine is not available in machine message is passed through GSM MODEM
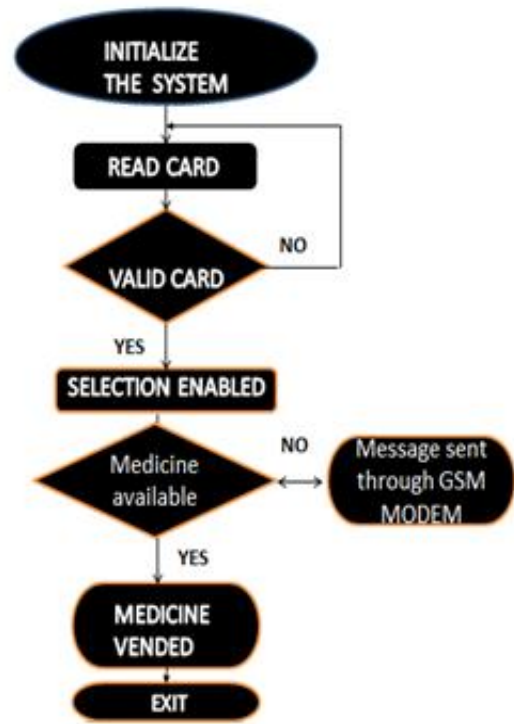
5.2 FLOW CHART

Fig. 9 Flow chart of proposed system

6. ADVANTAGES

- Availability of medicine at any time.
- We can implement it in railways and bus stations.
- In hospitals.

7. DISADVANTAGES

- Dispensing machines may be programmed incorrectly.
- Lack of knowledge on computerized machine.

8. RESULTS

Internal structure of the machine showing stepper motor, rotating springs, Arduino mega controller board and GSM.

Fig. 10 Internal compartment of AMVM

External view of machine showing LCD display, keypad, RFID reader.

Fig. 11 External view showing LCD, Keypad, RFID reader

Entering no of medicines required using keypad.

Fig. 12 Medicine entry through keypad

Medicines dispatched through outlet.
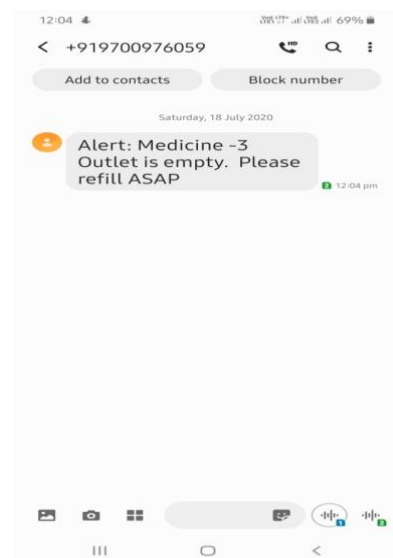

Fig. 13 Medicines dispatched through outlet

Fig. 14 Alert message from AMVM, when outlet is empty.

9. CONCLUSIONS

The anytime medicine vending machine is technically feasible for the people. Automated dispensing machines decentralized medication distribution systems that provide computer-controlled storage, dispensing of medicines.

The automated medical 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.

10. FUTURE SCOPE

There are different types of medicines in a machine. The machine accepts money through the RFID tag and will not accept any other type of money. Once the tag has been detected, the machine automatically dispenses the right medicine. The automatic medicine vending Machine will cater to the needs of the customers with no further human intervention required. The machine is user-friendly and is very simple to operate. With this, labor costs will be minimized and it will also give entrepreneurs the opportunity to attract more customers with this innovation.

11. ACKNOWLEDGEMENT

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