Intelligent Lifesaver Dispenser Machine using Raspberry-Pi 3

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Abstract: -Reaching out to basic healthcare is an important keystone of building a healthy nation. An intelligent lifesaver dispenser machine in areas where having a pharmacy is not feasible. It vends the machines in cases of emergency and ensures the drugs are available 24*7. This dispensing machine is a lifesaver in case of accidents on roads or highways, ruralareas, and the area where pharmacies are not within the reach. At the least first aid can be easily accessible with the help of this machine. The project is developed with Raspberry-pi 3, NodeMCU&RFID tag. NodeMCU notifies the predefined vendors when the medicine needs to be refilled.

Keywords: IoT, Raspberry-pi 3, NodeMCU, RFID card.

I. INTRODUCTION

Every time, landing on an article, we see the increasing ratio number of road accidents and lives lost in an accident. The unavailability of medical stores at any time is the major cause of losing lives in these road accidents. The lives which can be at least saved by providing immediate medication can control this increasing number. A situation where normal headache leads to migration and cough causing TB can be just avoided by taking medicines on time. Avoiding and delaying can just worsen the situations.

With advanced technology like IoT, this scenario can be improved. All-time medicine machine provides the immediate medication handling the emergency and providing the essential drugs on time-saving lives in large number. Situations, in which medical stores are closed at night and distance of the hospitals from accident spots on the highway can be controlled by this proposed system.

The medical device is essential to the practice of modern medicine. Raspberry-pi is mini-board computers providing with slots to connect with the monitor, keyboard, and other peripheral devices. Raspberry-pi 3 has Bluetooth, WI-FI and it has a more powerful CPU/GPU pair. Raspberry-pi has less power consumption than that provided by the Arduino controller providing 230V

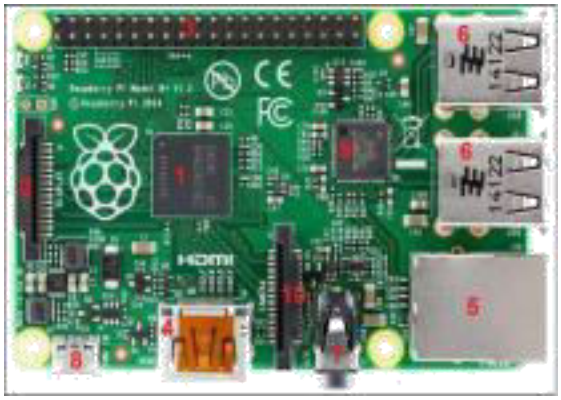
power. This system delivers the medicine by swiping the RFID card. The RFID card has the details of the tag and password associated with all users. It allows the user to enter medicine and if available dispenser it.

The NodeMCU is used to detect when the medicine goes below a certain level allowing to re-fill the system by the authorized organization.

II. HARDWARE COMPONENTS

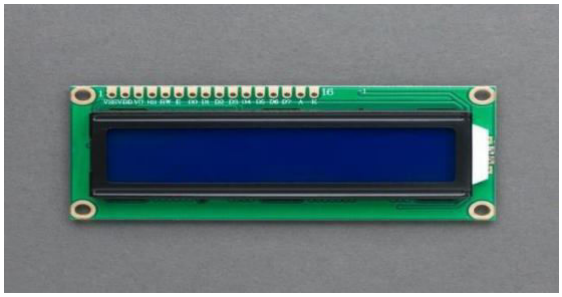
A. RASPBERRY PI 3 MODEL

Raspberry Pi is an 11'th version of the ARM microcontroller. It has inbuilt (Wi-Fi + Bluetooth) and it is like a small computer on a single IC. It contains processor core, 1to 2 GB RAM, ROM, extend internal memory up to 32GB .it has a total of 40 pin dedicated to performing various tasks, out of 40 pins, we are using only 28 GPIO (general purpose input/output)pins. It is a type of 8-bit RISC microcontroller board which control the functionality of all the component in the system. It has 5 ports: 1.USB hub port 2. HDMI (provide interface b/w any audio/video source). 3. Phone connector 4. power supply 5. ethernet (internet connection).The operating voltage is +3.3 volt to +5 volt.



B. LCD

LCD stands for liquid crystal display. It is a flat panel displaying content on an electronic device. The Vcc pin(PIN2) of LCD is connected to the + 5 volts of the raspberry pi. The PIN 3 of LCD used for contrast is grounded to provide maximum contrast. The data pin of LCD d7 is connected to the PIN 2 of raspberry pi and D6 is connected to the PIN 3 of raspberry Pi, D5 is connected to the PIN 4 of the Raspberry Pi, D4 is connected to the 5 PIN 5 of the raspberry pi. It has three control register Rs, Rw, En. The En of LCD is connected to the PIN 11 of the raspberry pi, RW is connected to the ground pin of the Raspberry Pi which allows pi to write in the display, Rs connected to the PIN 12 of the raspberry pi. LCD PIN 15 and 16 (anode and cathode) is connected to the +5 V and ground. The operating voltages are +4.7 volt to +5.3 volt.

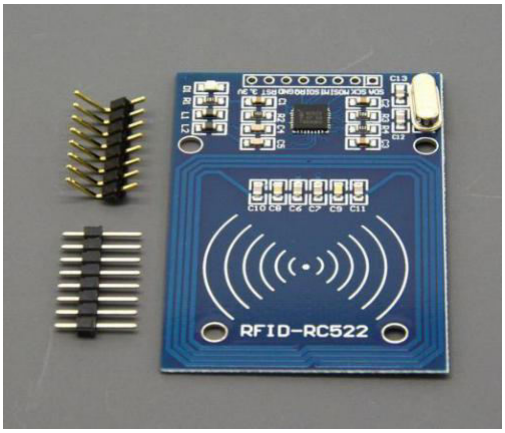


C. NodeMCU

NodeMCU is an open-source platform and their hardware design is open for edit/modify/built. It consists of ESP 8266 Wi-Fi enabled chip.it has 30 pins. It is a 32-bit Node microcontroller unit. It has one analog pin and 16 general-purpose input/output pin, out of 16 pins only 10 pins can be used for digital input/ output operation. NodeMCU provides access to these general-purpose input-output pins of ESP 8266 microcontroller. The system is implemented with the NodeMCU model. The Vcc pin of NodeMCU is connected to the + 5 volts of raspberry pi and the ground pin of NodeMCU is connected to the ground pin of raspberry pi and the TX of NodeMCU is connected to the RX of the raspberry pi module to establish communication.

D. RFID

RFID stands for radio frequency identification. It is wireless communication technology working on radio frequency or radio waves. It consists of three components: RFID tag, RFID reader, and antenna. An RFID tag is a system that uses a small radio frequency identification device for identification and tracking purposes.



RFID belongs to a technology referred to as automatic identification and data capture(AIDC).AIDC method automatically identifies an object, collect data about them, and then enter these data directly to the host computer system with the little or no human intervention. The operating voltage is + 5 volt. An RFID tag consists of an IC chip and antenna which is used to transmit data to the RFID reader. the RFID reader then converts radio waves to a more useful form of data information collected from the tag and then transferred to be host computer system through communication interface where the data can be stored in the database and analyzed at a later time.

E. DC MOTOR

DC motor is an electrical device which is used to converts electrical energy into mechanical energy. The internal mechanism of DC motor depends upon electromechanical or electrical periodic change with current inside the motor. Motor speed upon variable supply voltage o by changing the strength of the current in its field winding.

G. PERFBOARD

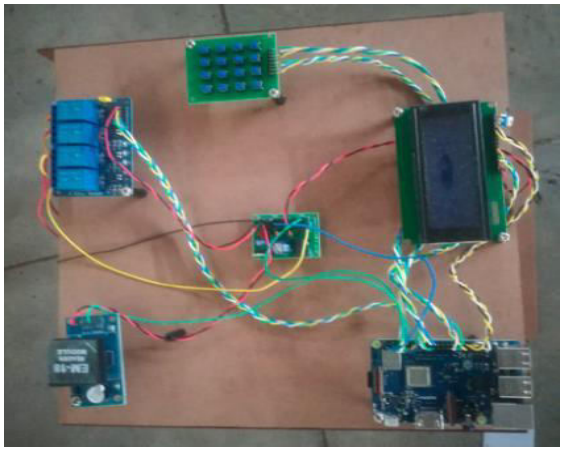
Perfboard is a thin, rigid sheet with standard interval holes pre-drilled on a 0.1-inch distance on the grid. Holes are present on the pad are rounded by copper rings. It is used for designing the layout of PCB without using extra wire. Once the design is finalized, the components are soldered on boards, by paying attention to its orientation of resistance, capacitor, diode, and integrated circuits.

III. Software Requirements

A. Python3

Python is created by Guido van Rossum in the year 1991. It is a high-level language that has dynamically type variable assigned and garbage collect feature in this. It is well known as an interpreted programming language; whose interpreter is available in many operating systems. It provides so many import packages that are very helpful infunctional programming. Python is easy to learn languages to the new learner and it is platform independent. Python 3 released in the year 2008 with its backward compatibility.

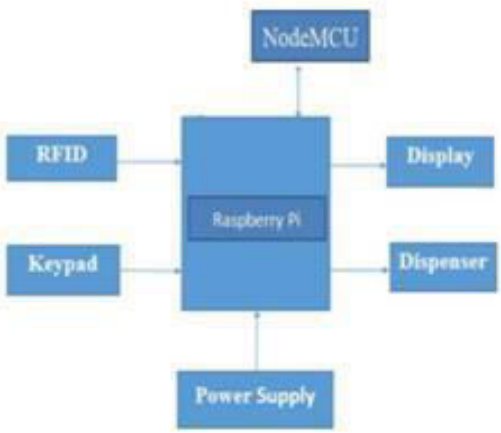
IV. METHODOLOGY



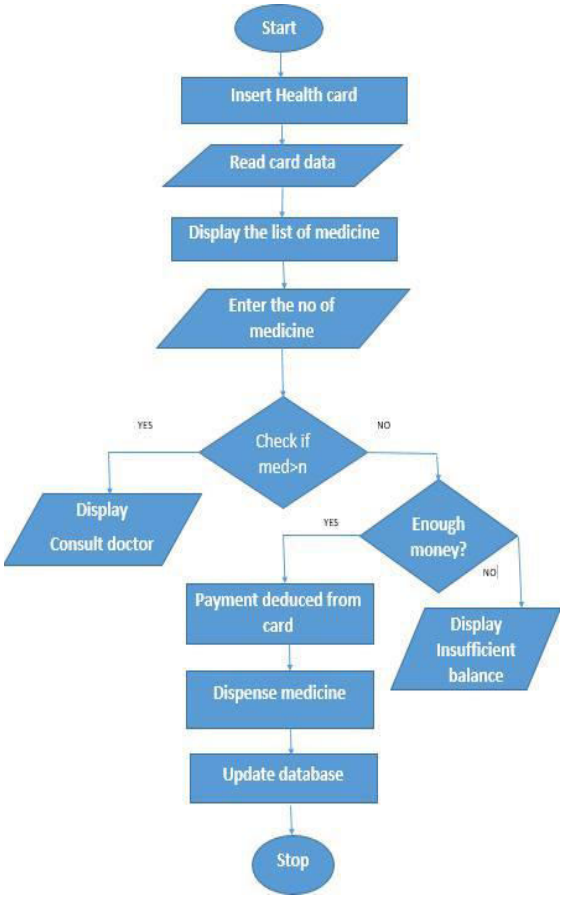
The system has raspberry Pi microcontroller which is 8 bit RISC microcontroller board which control the functionality of all the component in this system. The system is connected with hardware components like RFID module, keypad module, LCD module, NodeMCU module, and dispenser box.

Block Diagram

The system is a wireless data transfer tool which uses RFID card to store the data. The RFID consists of three components: RFID tag, RFID reader, and antenna. In this application, we are using RFID tag for person identification instead of cash payment. The RFID is a system that uses a small radio frequency identification device for identification and tracking purposes.The NodeMCU module provides wifi accessibility and notifies the vendor to refill the medicine. The LCD module display list of medicine. The dispenser box dispenses the pill.



Flowchart



At first, the national health care needs to be scanned. Then it will ask the user to enter the password. If the user is authorized, then the system will display the prescription of that user i.e. the list of medicines. Users can enter the number of medicines required. If the medicine is greater than mentioned in the prescription, then the system will ask the user to consult the doctor. If not, it will check for the available balance for the required number of medicines. If the balance is available, then the payment will be deducted from the card and the medicine is dispensed. If the balance is not enough then insufficient balance will be displayed. The database will be updated every time.

V. CONCLUSION

The healthcare field is one of the most delicate and important fields to be continuously enhanced. The Intelligent lifesaver dispensing machine is simple, flexible and efficient. It provides world-class medical facilities even in remote areas with no hospitals and minimum investment in infrastructure and maintenance. It maintains patient health information with the associated tag and password in the RFID card. If the number of medicines decreases below a certain level, then it sends the SMS to the authorized organization to refill the medicine.

VI. FUTURE WORK

In future cash accepting module will be implemented which will use concept of image processing from reorganization of the coin. Currently we are implementing the system RFID card and we could use NFC card instead. Delivery of etc medicine infested along with prescribed medication. In current system only prescribe medicines are dispensed but in future user can dispense medicine which does not require prescription like medicines that relief aches, pains and itches and first aid.

VII. REFERENCE

[1] KahtanAziz,SaedTarapiah, Salah Haj Ismail "Smart Real-Time Healthcare Monitoring and Tracking System using GSM/GPS Technologies,3rd MEC International Conference on Big Data and Smart Cities,2016.

[2] Ying-WenBaiandTing-HsuanKuo "Medication adherence by using a Hybrid Automatic Remainder Machine", IEEE International Conference,2016.

[3] Bhagya Shree SR, Chandra Shekar P, 'Automated Medication Dispensing System', 2015 IEEE.

[4] KahtanAziz, 'Real-Time Healthcare Monitoring and Tracking System using GSM/GPS Technologies', August 2016 IEEE.