SMART AUTOMATIC RATION DISTRIBUTION SYSTEM

A Project Report

Submitted to the APJ Abdul Kalam Technological University

in partial fulfillment of requirements for the award of degree

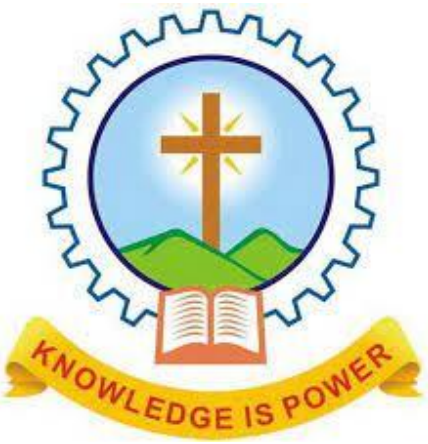
Bachelor of Technology

in

Electronics and Communication Engineering

by

SANJO SUNNY (MAC19EC100)



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MAR ATHANASIUS COLLEGE OF ENGINEERING, KOTHAMANGALAM

KERALA

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DEPT. OF ELECTRONICS & COMMUNICATION ENGINEERING

MAR ATHANASIUS COLLEGE OF ENGINEERING

KOTHAMANGALAM

CERTIFICATE

This is to certify that the Project report entitled **SMART AUTOMATIC RATION DISTRIBUTION SYSTEM** submitted by **SANJO SUNNY (MAC19EC100)** to the APJ Abdul Kalam Technological University in partial fulfillment of the B.Tech. degree in Electronics and Communication Engineering is a bonafide record of Project work carried under our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

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DECLARATION

I SANJO SUNNY (MAC19EC100) , hereby declare that the project report **SMART AUTOMATIC RATION DISTRIBUTION SYSTEM**, submitted for partial fulfillment of the requirements for the award of degree of Bachelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by me under supervision of Prof. Sneha Kurian .

This submission represents my ideas in my own words and where ideas or words of others have been included, I have adequately and accurately cited and referenced the original sources.

I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

Kothamangalam
06-06-2023

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Abstract

The Public Distribution system of providing basic domestic commodities on subsidy to poor families in developing countries like India, is an important aspect to meet basic requirements of people. The existing system in Ration shops needs manual measurement of commodities and maintenance of records of transactions. A lot of issues are encountered by the existing system such as diverting food grains to the open market etc.The project title Smart Automatic Ration Distribution System proposes an automatic method of distribution of commodities to authenticated card holders. Also, the details of transactions made are maintained in a database. Once they log into their accounts, they can view the stock availability. This system uses a fingerprint matching algorithm which efficiently works with a greater accuracy score. As a first step, one of the family members needs to register themselves to the portal. Once the beneficiary is logged in, he/she can check for the commodities that are available for that particular month. To dispense the commodities, the beneficiary is expected to provide a RF-ID card or fingerprint for the next level of authentication. Once the beneficiary is verified, the system dispenses a threshold quantity of commodities for the family.

Acknowledgement

I take this opportunity to express my deepest sense of gratitude and sincere thanks to everyone who helped me to complete this work successfully. I express my sincere thanks to Dr.Thomas George, Head of Department, Electronics and Communication Engineering, Mar Athanasius College of Engineering Kothamangalam for providing me with all the necessary facilities and support.

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SANJO SUNNY (MAC19EC100)

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Chapter 1

INTRODUCTION

A ration card is one of the most important documents for each and every citizen of India. It is used to purchase various commodities like rice, sugar, oil, wheat etc. at a cheaper price from the ration shops, issued by the government of India. This card serves as both a confirmation of identity and an address. The present ration card distribution system has many disadvantages such as imprecise quantity of goods, physical work, low processing rate, large waiting time, and unnecessary data. Because India is the world's second most populous country, distribution of ration is not an easy task. One of India's key public sectors is the ration distribution system.It oversees and distributes the essential goods to all the citizens of India mainly people below the poverty line and a few reserved categories such as military and police as well. Based on their ration card type such as Above Poverty Line or Below Poverty Line or Antyodaya Anna Yojana, food products will be given. Our proposed system eliminates the disadvantages of existing systems by using RFID and fingerprint module. RFID uses an EM field to detect and identify objects. All the details of the beneficiary and his family will be uploaded into the RFID tag. This card will be given to every registered consumer which can be used as a smart ration card. Any user who needs ration will have to put their fingerprint or flash their card through the scanner. Whenever any fingerprint matches or beneficiary flashes the card it will check in the database whether the beneficiary is valid or not. When a valid beneficiary is found the quantity of ration taken by him/her will be displayed on display using an application developed and a payment option will also will be provided. After payment a vending system using dc motor is to be designed to provide ration.

1.1 MOTIVATION

There has been many complains that most of the ration shop owners indulge in fraudulent activities and prevent the goods reaching the economically challenged people. Ration shop owners will also update the transactions wrongly if it is carried over manually. The precise quantity of ration received by the people is not updated accurately in the database maintained by the Government due to the inefficient automation in the existing scheme. There was also problem in the long queues that was created due to the lag in the manual ration system.Thus the people who are physically weak will be very much tired of using this system.In order to avoid the ration forgery and lag in the ration system, the automatic ration system was to be introduced.

The goal of this scheme is to create an automatic and expedient system to prevent the malpractices at ration shop. The key purpose of this scheme is to device a fingerprint matching algorithm for confirmation of user details and to atomize the delivery of the products to the people. In addition to it based on the quantity selected and received by the people, automatic updating process is carried over in Government database and we have goals to allow online payment options.

1.2 OBJECTIVE

The objective of the project is to automate the task of distribution of ration items efficiently. The project is aimed to stop corruption and discrepancies created in distribution shops. Here the system must perform the following:

*Verify the details of the customer using fingerprint or RFID

*Now give option for selection from the components allotted to them

*Avoiding irregularities in distribution of grains.

*To Distribute Ration materials using modern techniques.

*Restricting unauthorized card holders.

*Decreasing time wastage of waiting in queues for ration materials

Chapter 2

LITERATURE REVIEW

1. Dharahni Pingal in her paper has described a Centralized Web Enabled Ration Distribution and Corruption Controlling System is the project that will allow a smooth and easy ration distribution. The paper explains the concept of ration distribution and controlling.This system enabled the distribution of food equally among poor people. The commodities are stored in a storage tank, when goods are inserted in the FPS, then that quantity of goods is updated in the web server. That website can be accessed by the collector whenever he requires the ration from the respective ration shop.

2. Automatic Ration Material Distribution Based On GSM and RFID Technology by, S.Valarmathy, R.Ramani, Fahim Akhtar proposed an automatic Ration Materials Distribution Based on GSM and RFID. To avail the benefit of government user has to scan the code using the reader to fetch the details of items alloted.

3. Multi-Modality Bio metric Assisted Smart Card Based Ration Distribution System by Yogesh Kumar Sharma, K B Shiva Kumar proposed a technique of fingerprint scanning as well as face detection. The database stores the records of users purchase history. They use a centralized cloud system,so that transparency is maintained and users can access their details of record at some other fair price shop.

4.Automatic Smart Ration Distribution System for Prevention of Civil Supplies Hoarding In India by Dr.M.PALLIKONDA RAJESEKARAN and D.BALAJI This proposed project is for the benefit of common people and the government. The device find's its application in the ration shop run by the government. Also, this project's electronic device can also be modified and made to be used in the glossaries shops and markets as a vending machine for measuring commodities in a smart and automated manner which saves workers and time employed for the process of measuring and delivery of goods. Also, when implemented in the Ration shops across Tamil Nadu, the government official can have a check on the on-going of each and every transaction done in the ration shops from their head office and this access of information privilege is given to every citizen of India as a Right to Information under the Act of Consumer Rights.

Chapter 3

METHODOLOGY

3.1 Register user

The system collects information about beneficiaries, such as their name, residence, date of birth, age, phone number, family number, and category of cards .These are all done by the admin. The website contains all the information.

3.2 Fingerprint or RFID card verification

The user can verify their identity by using fingerprint scanner or flashing the RFID card to the scanner, the system verifies the card if it is valid or not

3.3 Ration Dispense

After verification of the user, the beneficiary is presented with a list of commodities present in the data base. The beneficiary has to select the list of commodities he/she wants to purchase. The system will display the total quantity of the commodities that he/she wants to purchase. Once he/she confirms the commodities,the payment option will be open and the beneficiaries are provided with the product. to the user after dispensing the ration from the outlet.

3.4 Update Stock

After purchasing the ration, the database will be updated with the new balance for that particular month.

Chapter 4

IMPLEMENTATION

4.1 Block Diagram

The proposed system consists of At mega 328, EM18 RFID READER, R307 fingerprint module, Wiper motor, Sucker pump, ULN2003A Motor Driver and relays. EM 18 RF ID READER is used for reading the RFID tags. R307 fingerprint module is used for authentication purpose. Wiper motor is used to open and close the valve during dispensing operation.Sucker pump is used to control flow of liquid material. The output power from the micro controller is 5V which is not sufficient to drive 12V motor driver. Hence ULN2003A Motor Driver with support of relays drives the Wiper motor and Sucker pump.

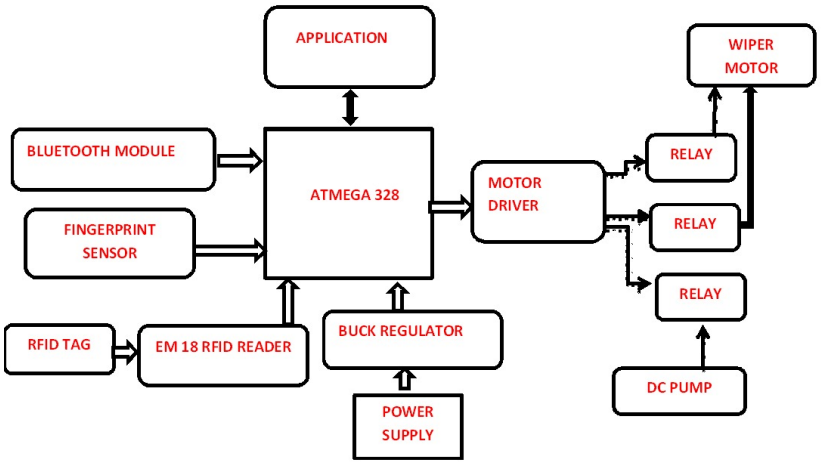


Figure 4.1: Proposed Block Diagram of automatic ration system

4.2 ATmega328

Figure 4.2: ATmega328

Atmel's 8-bit AVR RISC-based microcontroller has 32KB of ISP Flash memory with read-while-write capability, 1KB of EEPROM, 2KB of SRAM, 23 general-purpose I/O lines, 32 general-purpose working registers, three flexible timers/counters in compare mode, internal and external interrupts, serial programmable USART,
2-wire byte-oriented serial interface, SPI serial interface, 6-channel 10-bit A/D converter (8 channels in TQFP and QFN/MLF packages), programmable watchdog internal oscillator and 5 Timer with software selectable power saving modes. The device operates from 1.8 to 5.5 volts. This device achieves a throughput of approximately 1 MIPS/MHz.

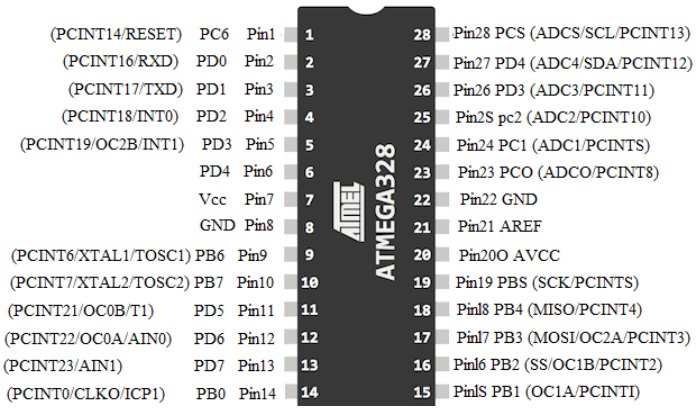


Figure 4.3: ATmega328 Pinout

Parameter	Value
CPU type	8-bit AVR
Package Pin count	28
Flash Program Memory	32 Kbytes
EEPROM Data Memory	1 Kbytes
SRAM Data Memory	2 Kbytes
I/O Pins	23
Timers	Two 8-bit / One 16-bit
A/D Converter	10-bit Six Channel
PWM	Six Channels
RTC	Yes with Separate Oscillator
External Oscillator	up to 20MHz
External Interrupts	2
USB interface	No
Capacitive touch sensing channels	16

Figure 4.4: ATmega328 Specifications

4.3 RFID Module(EM18)

Figure 4.5: RFID Module(EM18)

Specifications and Features of EM-18 RFID Reader Module:-

Operating Voltage: 5V DC Supply

Reading Distance: 6-10 cm

Read frequency:125kHz.

EM4001 64 – bit RFID tag compatible, 9600bps ASCII output.

Current : + 50 mA

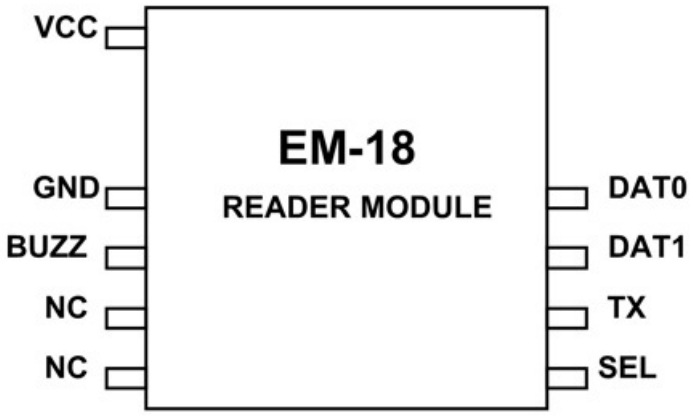


Figure 4.6: RFID pinout

Operating Frequency : 125 Khz

Read Distance : 5 cm

Compatible Tags : 125KHz EM4100

Tags,Size : 32mm(length)*32mm(width)*8mm(height)

Application of EM-18 RFID Reader Module:-

Smart Access Control System.

Card Based Entry System.

Attendance System.

DIY projects requiring need for RFID based System

4.4 R307 Fingerprint Sensor

R307 Fingerprint Module consists of optical fingerprint sensor, high-speed DSP processor, high-performance fingerprint alignment algorithm, high-capacity FLASH chips and other hardware and software composition, stable performance, simple structure, with fingerprint entry, image processing, fingerprint matching, search and template storage and other functions.

Features:

Figure 4.7: fingerprint sensor

Perfect function: independent fingerprint collection, fingerprint registration, fingerprint comparison (1: 1) and fingerprint search (1: N) function. Small size: small size, no external DSP chip algorithm, has been integrated, easy to install, less fault.
Ultra-low power consumption: low power consumption of the product as a whole, suitable for low-power requirements of the occasion.
Anti-static ability: a strong anti-static ability, anti-static index reached 15KV above.
Application development is simple: developers can provide control instructions, self-fingerprint application product development, without the need for professional knowledge of fingerprinting.
Adjustable security level: suitable for different applications, security levels can be set by the user to adjust. Finger touch sensing signal output, low effective, sensing circuit standby current is very low, less than 5uA.
The method employed to scan the image is optical scanning. The scanning process starts when a person places the finger on a glass plate, and a CCD camera takes a picture. An analog-to-digital converter in the scanner system processes the analog electrical signal to generate a digital representation of this image.

4.5 ULN2003A Motor Driver

The ULN2003 is one of the most common motor driver ICs, consisting of an array of 7 Darlington transistor pairs, each pair is capable of driving loads of up to 500mA and 50V. Four out of seven pairs are used on this board.
The board has a connector that mates the motor wires perfectly which makes it very easy to connect the motor to the board. There are also connections for four control

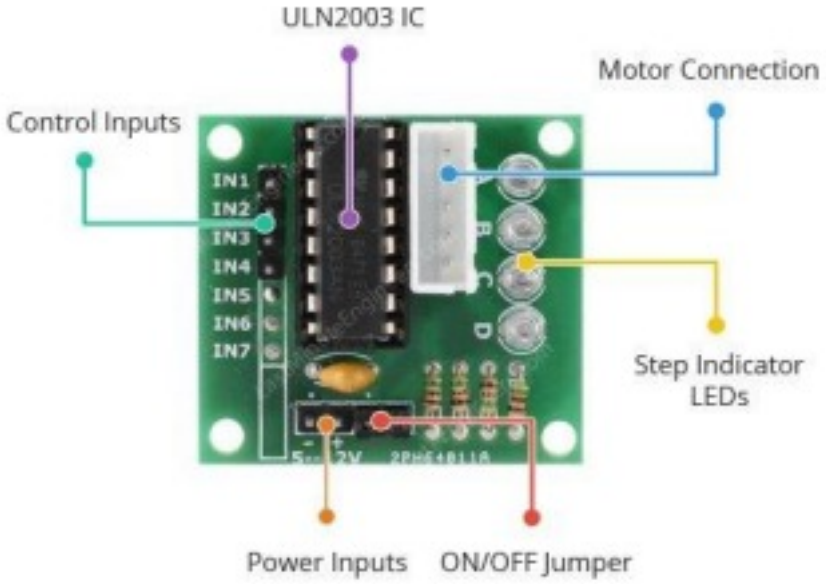


Figure 4.8: ULN2003A Motor Driver

inputs as well as power supply connections. The board has four LEDs that show activity on the four control input lines (to indicate stepping state). They provide a nice visual when stepping. The board also comes with an ON/OFF jumper to isolate power to the stepper Motor

IN1 – IN4 pins are used to drive the motor. Connect them to a digital output pins on the Arduino. GND is a common ground pin. VDD pin supplies power for the motor. Connect it to an external 5V power supply. Because the motor draws too much power, you should NEVER use the 5V power from your Arduino to power this stepper motor. Motor Connector This is where the motor plugs into. The connector is keyed, so it only goes in one way.

4.6 Wiper Motor

A 12V 55Rpm DC Wiper Motor is commonly used as wiper motor for cars, but it can also be used in the field vehicles and projects that require high power. The motor speed is 55rpm and because of the bearing used it has no problem with longer operation times. The motor has 6mm screw holes for mounting and its gear is designed to be on left side of the motor.

Product Description

Figure 4.9: Wiper Motor

* 12V operating voltage
* 55rpm speed
* 2A free running current
* 10A stall torque
* 120W motor power
* 100m shaft diameter
* 29mm shaft length
* Shaft diameter: 10mm

4.7 HC05 Bluetooth module

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration. Bluetooth version: 2.0 + EDR (Enhanced Data Rate) Frequency: 2.4 GHz ISM band Modulation: GFSK (Gaussian Frequency Shift Keying) Transmit power: Class 2 (up to 4 dBm) Sensitivity: -80 dBm typical Range: approximately 10 meters (or 33 feet) in open air Profiles supported:

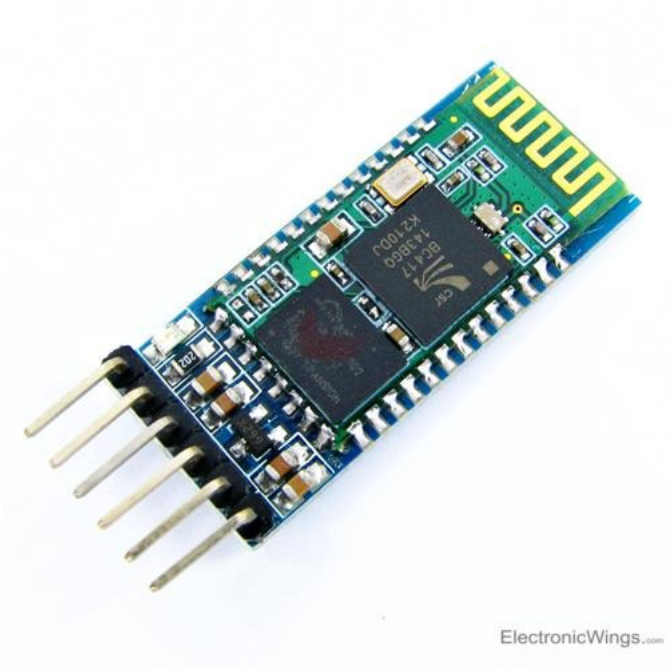


Figure 4.10: Blutooth module

SPP (Serial Port Profile), HID (Human Interface Device) and others Operating voltage: 3.3V to 5V DC Operating current: less than 50mA Standby current: less than 2.5mA Sleep current: less than 1mA

HC05 BLUETOOTH MODULE PIN DIAGRAM

Figure 4.11: Bluetooth module pin diagram

Pins of bluetooth:

1.Key/EN: It is used to bring Bluetooth module in AT commands mode. If Key/EN pin is set to high, then this module will work in command mode. Otherwise by default it is in data mode. The default baud rate of HC-05 in command mode is 38400bps and

9600 in data mode.

2. VCC: Connect 5 V or 3.3 V to this Pin.

3. GND: Ground Pin of module.

4. TXD: Transmit Serial data

5. RXD: Receive data serially

6. State: It tells whether module is connected or not.

4.8 Buck Regulator

Figure 4.12: Buck Regulator

Input: DC 3V to 40V (input voltage must be higher than the output voltage to 1.5v above can not boost)

* Output: DC 1.5V to 35V voltage continuously adjustable, high-efficiency maximum output current of 3A

* Features: All Sanyo solid capacitors, the 36u thickening circuit boards, high-Q inductance with output value of high-power LED indicator

* Dimensions: 45 (L) x 20 (W) x 14 (H) mm (with potentiometer)

* weight: 20 gms

Buck converters typically contain at least two semiconductors (a diode and a transistor, although modern buck converters frequently replace the diode with a second transistor used for synchronous rectification) and at least one energy storage element (a capacitor, inductor, or the two in combination).

4.9 Sucker pump

Figure 4.13: Sucker pump

A suction pump works by atmospheric pressure; when the piston is raised, creating a partial vacuum, atmospheric pressure outside forces water into the cylinder, whence it is permitted to escape by an outlet valve.A pump for raising water or other fluids by suction, consisting essentially of a vertical cylinder in which a piston works up and down, both the cylinder and the pump having valves that control the flow of the fluid.

Chapter 5

SCHEMATIC AND PCB DESIGN

5.1 PCB Design

Printed circuit board (PCB) design brings your electronic circuits to life in the physical form. Using layout software, the PCB design process combines component placement and routing to define electrical connectivity on a manufactured circuit board.Printed circuit boards are used in nearly all electronic products. PCBs require additional design effort to lay out the circuit, but manufacturing and assembly can be automated. Electronic design automation software is available to do much of the work of layout.

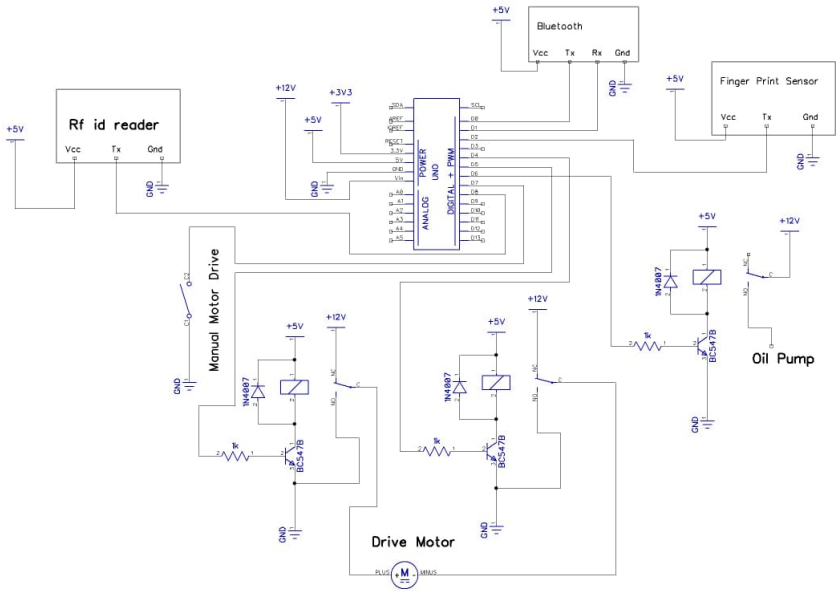


Figure 5.1: Schematic

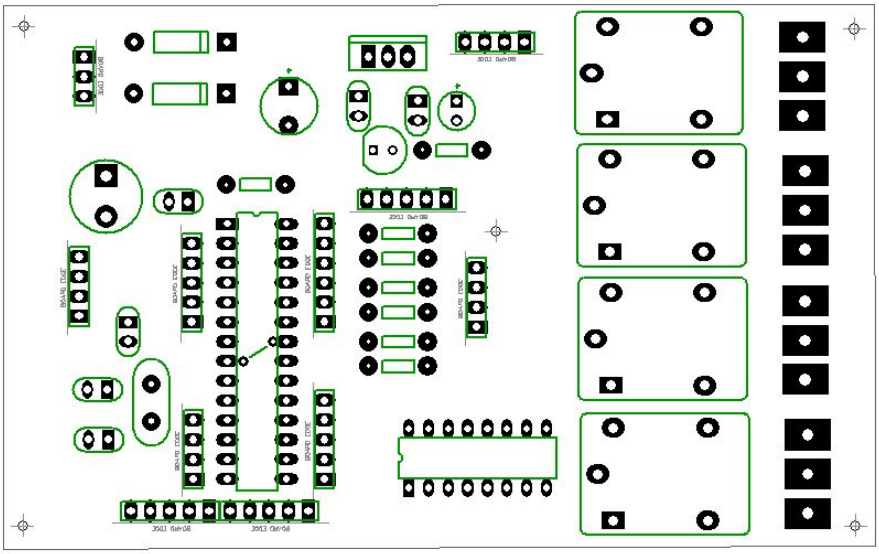


Figure 5.2: PCB layout draft

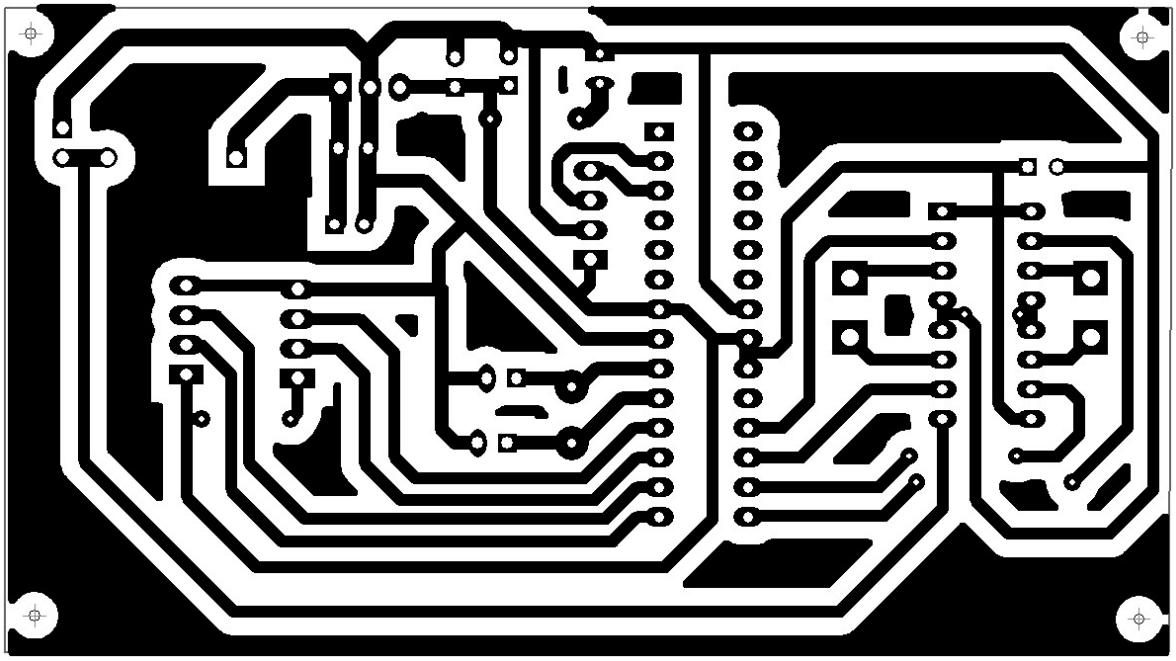


Figure 5.3: PCB layout

5.2 SIMULATION

This figure shows the simulation of 12V DC motor in Proteus. When the input is applied the DC motor rotates in the anticlockwise direction so that, the valve opens and dispensing of the product occurs. After a time delay which is set in the program , the DC motor rotates in the clockwise direction leading to closing of the valve so that dispensing stops

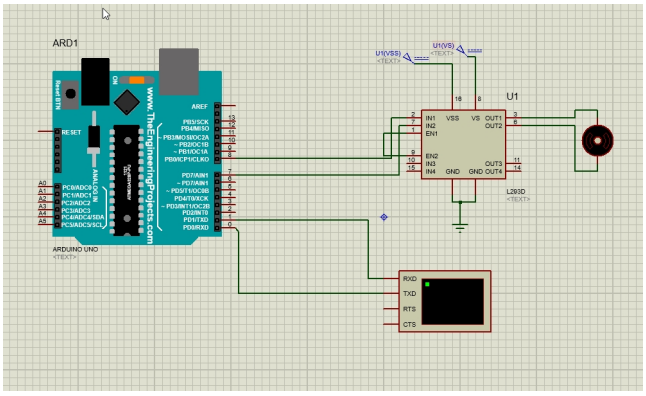


Figure 5.4: simulation diagram

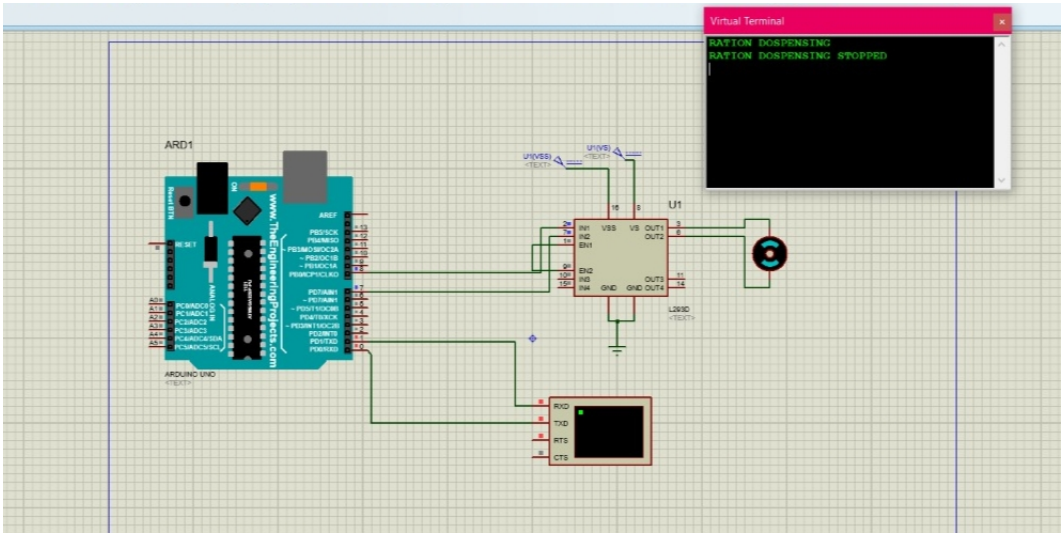


Figure 5.5: working of proteus simulation

Chapter 6

SOFTWARE DESCRIPTION

6.1 Diptrace

DipTrace is a proprietary software suite for electronic design automation (EDA) used for electronic schematic capture and printed circuit board layouts. DipTrace has four applications: schematic capture editor, PCB layout editor with built-in shape-based autorouter and 3D preview, component editor, and pattern editor.

Features:

Simple user interface

Multi-sheet and hierarchical schematics

High-speed and differential signal routing

Smart manual routing modes

Wide import/export capabilities

High-speed shape-based autorouter

Advanced verifications with real-time DRC

Real-time 3D PCB preview

Export of PCB to STEP 3D file format

ODB++ and Gerber (including Gerber X2) manufacturing outputs 3D preview

Screenshot of 3D preview in DipTrace v3 (2016) This module includes real-time 3D preview export feature. It shows the model of the manufactured printed circuit board with all components installed. Rotate board in three axes, zoom in and out in real time, change colors of the board, copper areas, solder mask, silkscreen, and background. 3D preview works on all stages of the design.

Export Board can be exported to STEP or VRML 2.0 formats for mechanical CAD modeling. More than 7500 3D models of PCB packages are supplied for free. Externally designed 3D models in *.wrl, *.step, *.iges, and *.3ds formats can be uploaded and attached to patterns in Pattern Editor or PCB Layout.

Modules DipTrace has a launcher application with five buttons that help users easily start each DipTrace module:

Schematic Capture PCB Layout Component Editor Pattern Editor Schematic capture

6.1.1 Screenshot of schematic capture in DipTrace v3 (2016)

Advanced circuit design tool with support of multi-sheet and multi-level hierarchical schematics that delivers a number of features for visual and logical pin connections. Cross-module management ensures that principal circuits can be easily converted into a PCB, back-annotated, or imported/exported from/to other EDA software, CAD formats and net-lists. DipTrace Schematic has ERC verification and Spice export for external simulation.

6.1.2 PCB layout

Engineering tool for board design with smart manual routing, differential pairs, length-matching tools, shape-based autorouter, advanced verification, layer stackup manager, and wide import/export capabilities. Design requirements are defined by net classes, class-to-class rules, and detailed settings by object types for each class or layer. When routing with real-time DRC, the program reports errors on the fly before actually making them. DRC also checks length and phase tolerances for differential pairs and controls signal synchronization for nets and buses (including layer stackup and bonding wire induced signal delays). The board can be previewed in 3D and exported to STEP format for mechanical CAD modeling. Design rule check with in-depth detailing and net connectivity verification procedures are available.

6.1.3 Component editor

Manage component libraries and create single- or multi-part components by selecting a template and its dimensions, defining visual and electrical pin parameters, setting up a Spice model, and attaching pattern with a 3D model to finalize component creation. BSDL import, bulk pin naming, and pin manager tools for pins and buses. Importing libraries from different EDA formats. More than 140000 components in standard libraries.

6.1.4 Pattern editor

Draw patterns with various types of shapes, pads, holes, and dimensions. Circle, lines (headers, DIP), square (QFP), matrix (BGA), rectangle (RQFP), and zig-zag standard templates. Creation of pattern is basically selecting a template, entering a couple of vital parameters, drawing the silkscreen, and launching automatic pad renumbering. Custom templates can be created for non-standard patterns. DXF import makes creating complex layouts easier..

6.2 Proteus Design Suite

Proteus Design Suite is a proprietary software toolkit used primarily for electronic Design automation. This software is mainly used by electronic designers and engineers to create electronic schemin frontnd prints for PCB manufacturing. It is developed by Labcenter Electronics Ltd. in Yorkshire, England. Proteus Design Suite is used for schematic capture, simulation, and PCB layout design. Schematic capture in Proteus Design Suite is used both during design simulation and during the design phase of a PCB layout project. The Microcontroller simulation in Proteus works by applying a hex file or debug file to the microcontroller part of the schematic. It is then co-simulated with the analog and digital electronics connected to it. The PCB Layout module automatically retrieves connection information as a network list from the Capture Diagram module. Apply this information with custom design rules and various design automation tools to aid in error-free table design. PCBs with up to 16 copper layers can be manufactured with design sizes limited by a product configuration. The

3D Viewer module allows you to view your growing board in 3D, displaying a semi-transparent elevation that shows the case of the board. The STEP output can then be used to transfer to mechanical CAD software such as Solid works or Autodesk for precise board assembly and positioning

6.3 Arduino IDE

Arduino IDE is an open-source software, designed by Arduino.cc and is mainly used to write, compile and upload code to most Arduino modules. It's the official Arduino software, which makes compiling code too easy. It is available for all operating systems, such as MAC, Windows, and Linux, and works on the Java platform with built-in functions and commands that play an important role in debugging, editing, compiling, and code translation. A wide range of Arduino modules is available including Arduino Uno, Arduino Mega, Arduino Leonardo, Arduino Micro, and many more that contain an on-board micro controller that is actually programmed and accepts information in the form of code that can be can easily done in the computer. The main code, also known as the sketch, generated on the IDE platform will eventually generate a hex file, which will then be uploaded and downloaded to the board controller. The IDE environment contains mainly two basic parts: Editor and compiler where the former is used to write the required code and the latter is used to compile and upload the code to the given Arduino module. This environment supports both C and C++ languages.

6.4 Android APP Development - MIT App Inverter

App Inventor for Android is an open-source web application originally provided by Google, and now maintained by the Massachusetts Institute of Technology (MIT). It allows newcomers to computer programming to create software applications for the Android operating system (OS). It uses a graphical interface, very similar to Scratch and the StarLogo TNG user interface, which allows users to drag-and-drop visual

objects to create an application that can run on Android devices. In creating App Inventor, Google drew upon significant prior research in educational computing, as well as work done within Google on online development environments.

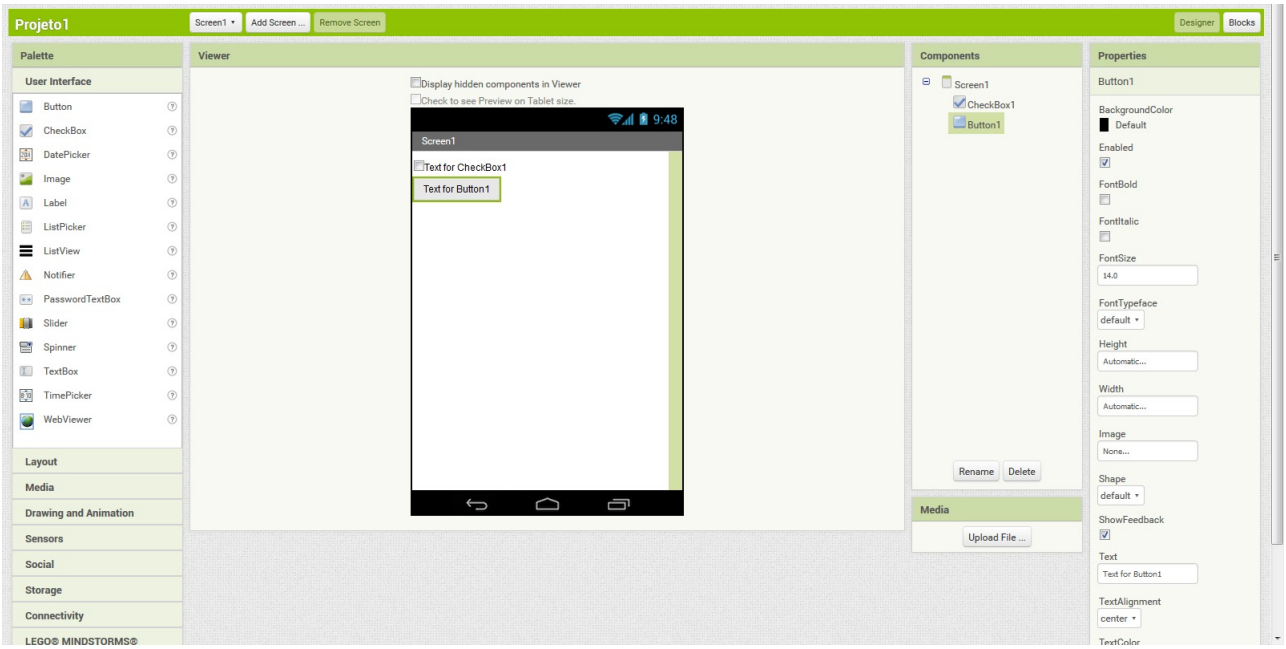
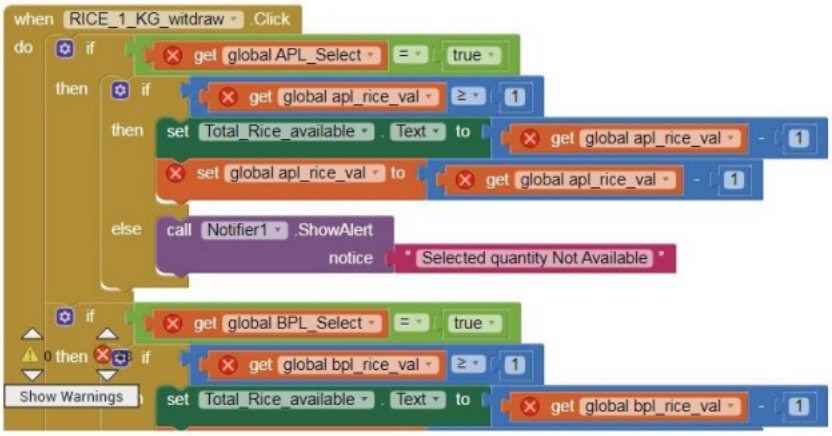


Figure 6.1: Android Aapp Development - MIT App Invetrer



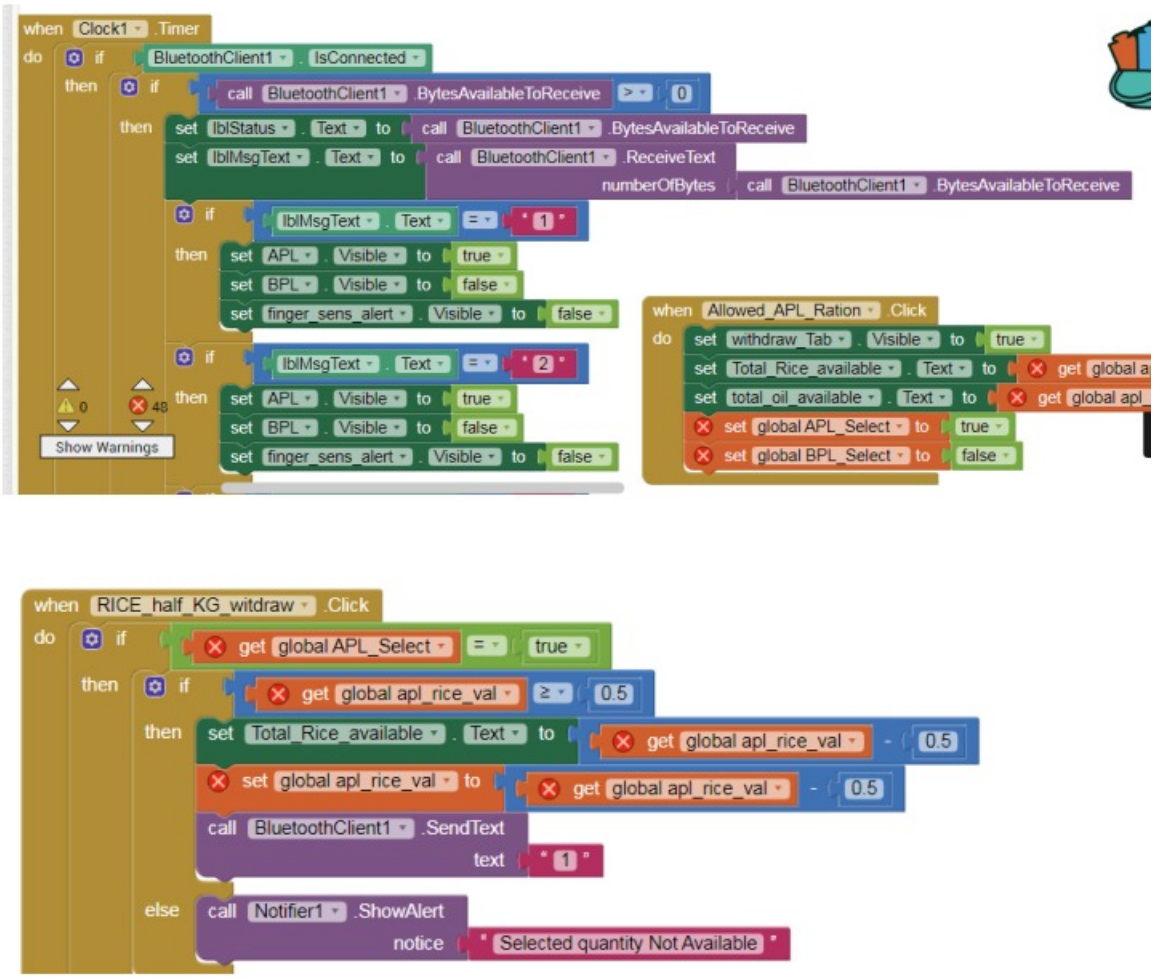


Figure 6.2: Android App Development

MIT App Inventor is basically for creating Android Apps in your browser where you design how the app will look and function. Like fitting together puzzle pieces, you set how your app will behave to different events by simply signing in with your Gmail Account, so that the App Inventor server can store your work and help you keep track of projects. It basically consists of two parts 1. App Inventor Designer 2. App Inventor Block Editor In App Inventor Designer you select the components for your app while in App Inventor Block Editor you assemble program blocks that specify how the components should behave visually, fitting pieces together like pieces of a puzzle. After completing the above phases you may run your app directly in your Android phone by connecting it to your computer or may run it on Android Emulator if you don't have an Android phone. Moreover you may even download your app (.apk file) and install and run it on your Android device directly.

Chapter 7

RESULT

7.1 Prototype

Figure 7.1: Prototype

7.2 Connect the application through Bluetooth module

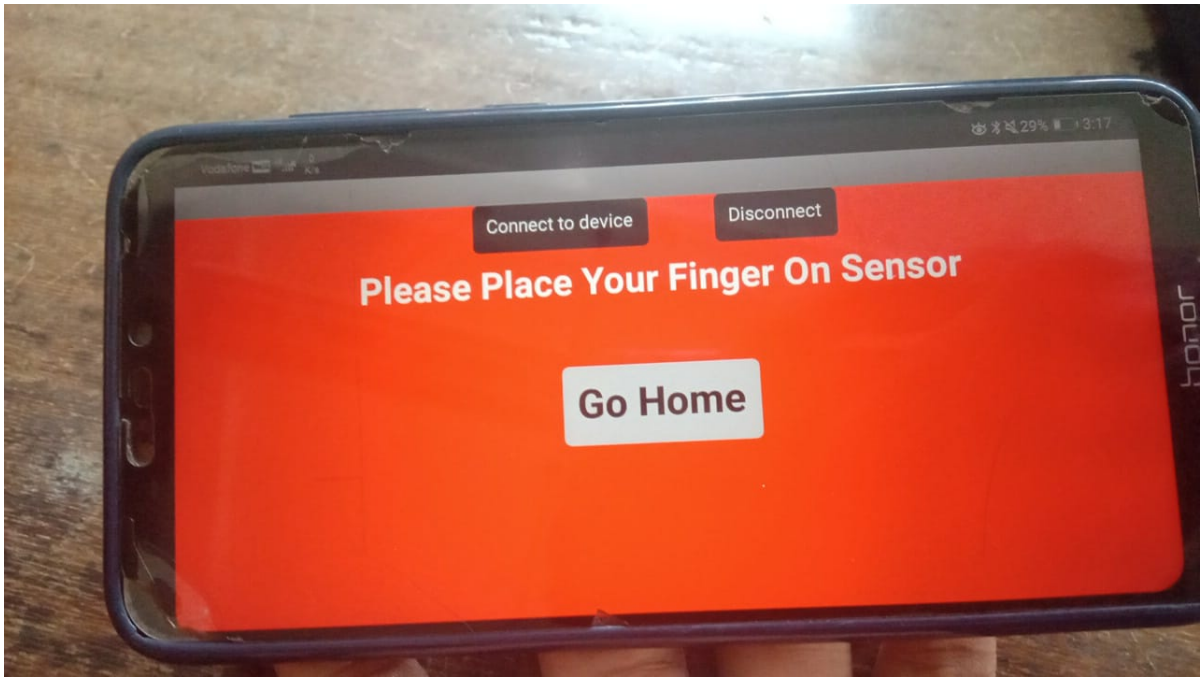


Figure 7.2: Android app

Figure 7.3: Android app connecting

7.3 Fingerprint or RF ID verification

Figure 7.4: RFID scanning

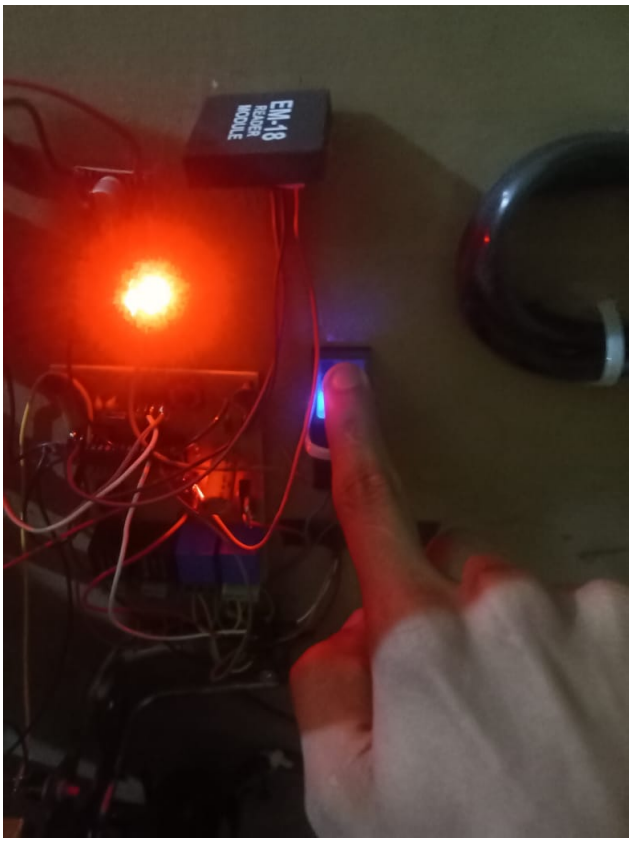


Figure 7.5: fingerprint scanning

7.4 System identifies the user

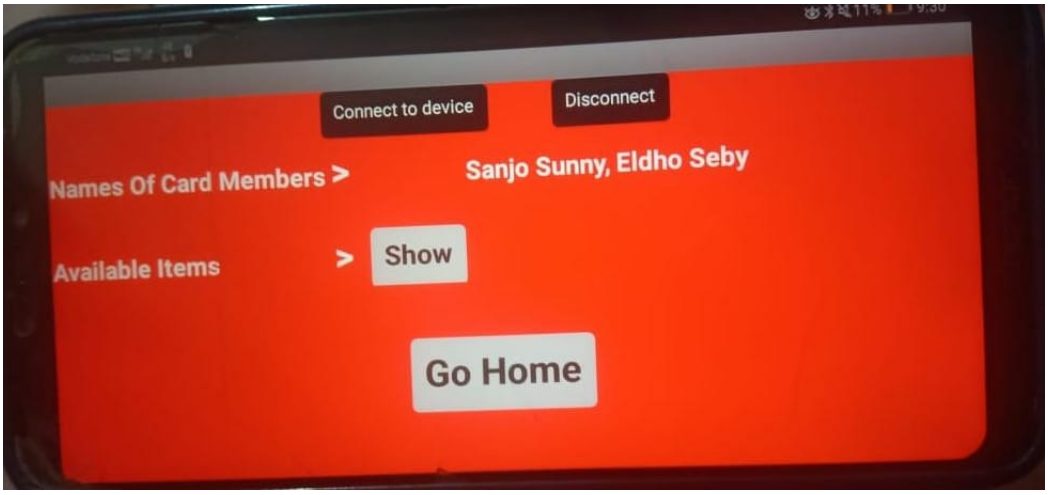


Figure 7.6: Android app

7.5 Select the requirements

Figure 7.7: Android app

7.6 Dispensing the ration- Solid material

Figure 7.8: solid material tank dispensing

7.7 Dispensing the ration- liquid material

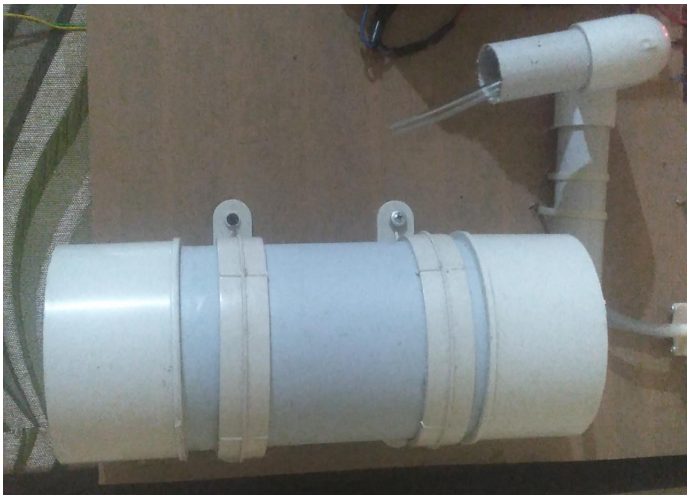


Figure 7.9: liquid material dispensing

Chapter 8

CONCLUSION AND FUTURE WORKS

8.1 Conclusion

Ration forgery is one of the most difficult challenges faced by the food distribution department. There may be chances where ration is delivered to the beneficiaries and false records are noted down, regarding the delivery by commission agent. And there is a probability of him (commission agent) selling the commodities in the open market with extra profit etc. Therefore, the proposed system is more secure and transparent then the normal existing system. Entry of fallacious data in the ration database can be avoided with the use of smart cards and additional security is provided by the bio metric authentication. The commission agent is only responsible for entering the quantity of the commodities, whereas updating and deducting is solely handled by the server (food department). Maintaining the database is also helpful for settling complains in ration system. It is anticipated that the proposed project will create transparency in the public distribution system as the work becomes automatic and also it makes the system free from irregularities.

8.2 Future Work

In the future this system can be improvised with many technologies such as Artificial intelligence and machine learning, also the system is expected to have a lot of improvements, including remote access and booking of commodities. Also automated or semi-automated home delivery systems may be implemented with research and study. To a great extent it is possible to have AI influence where the customer does not need to order commodities, the system automatically detects the deficit items and book them. The Proposed idea can also be implemented in Supermarkets, Malls etc other than ration shops.

Figure 8.1: Advanced ration shop

References

[1] A. K. Vaisakh, K. V. Ganesh, “IOT based intelligent public ration distribution”, IEEE, July2019.

[2] Abhirup Kar, Mohak Gupta, “RFID - based automatic ration vending machine to avoidcorruption and malpractices at ration shops”, IRJET, May 2018.

[3] Goradia, “AUTOMATED ration distribution system”, Researchgate, December 2015.

[4] Sripad V Deshpande, “BIOMETRIC authentication based automated ration disbursal for publicdistribution system”, IJRTE, December 2019.

[5] A study on the ethical aspects of the public distribution system: with reference to jamirah gaon panchayat samabay samiti of dibrugarh district Ananya Sarmah *1, Himadree Gogoi 2 *1, 2 Research Scholar, Department of Commerce, Dibrugarh University, India

[6] Automated Ration Distribution System, Jinali Goradiaa, Student at University of Texas, Dallas, 7825, McCallum Blvd, C00516, Dallas, TX 75252, USA. Sarthak Doshib- Technology Analyst, J.P.Morgan Chase, 128/6, Laud Bhuvan, Road no-24A, Jain Society, Sion west, Mumbai 400022, India.

[7] Automation in Ration Product Distribution. J.Clara, Post Graduate Student, Embedded System Technologies, Knowledge Institute of Technology, Salem, Tamil Nadu, India. M.Jagadeeshraja Assistant Professor, Department of Electrical and Electronics Engineering, Knowledge Institute of Technology, Salem,Tamil Nadu, India2.

[8] "Security applications challenges of RFID technology and possible counter-measures", SghaierGuizani, in 2014 International Conference on Computing,Management and Telecommunications(ComManTel), IEEE, April 2014.

[9] Swapnil R. Kurkute, Chetan Medhe, AshleshaRevgade and Ashwini Kshirsagar, "Automatic ration distribution system – A review", in 2016 3rdInternational Conference on Computing for Sustainable Global Development (INDIACom), IEEE, March 2016.

[10] FaouziKamoun, Omar Alfandi and Sami Miniaoui, "An RFID solution for the monitoring of storage time and localization of perishable food in adistribution center," in 2015 Global Summit on Computer Information Technology (GSCIT), IEEE, June 2015.

[11] S. I. Lao, K. L. Choy, Y. C. Tsim and T. C. Poon, "A RFID-based decision support system for food receiving operations assignment,"

[12] Amitangshu Pal and Krishna Kant, "Smartporter: a combined perishable food and people transport architecture in smart urban areas," in 2016 IEEEInternational Conference on Smart Computing (SMARTCOMP), IEEE, May 2016

[13] Divya K.Lakshmi Narayanan, G.P.Ramesh "Robust and Brittle Secured Video for IoT" in International Journal of Engineering and Technology, 7 2.20, 93-96, 2018.

[14] K.Lakshmi Narayanan, Mr.J.Ganesan, Mr.Kasinathaguru, "Intranet Based Multiple Equipment Controller with Text Panel", Irish Interdisciplinary Journal of Science Research, Vol.4, Iss.3, Pages 120-126, July-September 2020.

[15] R. Santhana Krishnan , E. Golden Julie , Y. Harold Robinson , S. Raja , Raghvendra Kumar , Pham Huy Thong , Le Hoang Son "Fuzzy Logic based Smart Irrigation System using Internet of Things", Journal of Cleaner Production, Volume 252, 10 April 2020, 119902

Chapter 9

Appendix

9.1 Source code

```
#include < Adafruit_Fingerprint.h >

const int motor_clockwise=4;
const int motor_anticlockwise=5;
const int pump=6;
const int motor_manual=7;
const int rf=8;


SoftwareSerial mySerial(2, 3);


#define mySerial Serial1


Adafruit _Fingerprint finger = Adafruit _Fingerprint(&mySerial);


void setup()
{
pinMode(motor _ clockwise,OUTPUT);
pinMode(motor _ anticlockwise,OUTPUT);
pinMode(pump,OUTPUT);
```

```
pinMode(motor_ manual,INPUT _ PULLUP);
digitalWrite(motor _ clockwise,HIGH);
digitalWrite(motor _ anticlockwise,HIGH);
digitalWrite(pump,LOW);
pinMode(13,OUTPUT);

Serial.begin(9600);

finger.begin(57600);
delay(5);

finger.getParameters();

}

void loop()                                    // run over and over again
{
getFingerprintID();
delay(200);                                    //don't ned to run this at full speed.
digitalWrite(13,HIGH);
delay(100);
digitalWrite(13,LOW);
delay(100);
do
{
if(digitalRead(motor _ manual)==LOW)
{
digitalWrite(motor _ clockwise,HIGH); //////////////0.5 kg dispens
digitalWrite(motor _ anticlockwise,LOW);
}
```

```
}
while(digitalRead(motor _ manual)==LOW);
digitalWrite(motor _ clockwise,HIGH);
digitalWrite(motor _ anticlockwise,HIGH);
if (Serial.available()   0) {
int inByte = Serial.read();

switch (inByte) {

case '1':
digitalWrite(motor _ clockwise,HIGH); //////////////0.5 kg dispens
digitalWrite(motor _ anticlockwise,LOW);
delay(1000);
digitalWrite(motor _ clockwise,HIGH);
digitalWrite(motor _ anticlockwise,HIGH);
delay(7000);
digitalWrite(motor _ clockwise,LOW);
digitalWrite(motor _ anticlockwise,HIGH);
delay(1000);
digitalWrite(motor _ clockwise,HIGH);
digitalWrite(motor _ anticlockwise,HIGH);

break;

case '2':
digitalWrite(motor _ clockwise,HIGH); /////1 kg
digitalWrite(motor _ anticlockwise,LOW);
delay(1000);
digitalWrite(motor _ clockwise,HIGH);
digitalWrite(motor _ anticlockwise,HIGH);
delay(14000);
digitalWrite(motor _ clockwise,LOW);
```

```
digitalWrite(motor _ anticlockwise,HIGH);
delay(1000);
digitalWrite(motor _ clockwise,HIGH);
digitalWrite(motor _ anticlockwise,HIGH);

break;

case ’3’: /// 0.5 L dispens

digitalWrite(pump,HIGH);
delay(7000);
digitalWrite(pump,LOW);

break;

case ’4’: /// 1 L dispens

digitalWrite(pump,HIGH);
delay(14000);
digitalWrite(pump,LOW);

break;

default:

delay(100);
}
}
```

```
if(digitalRead(rf==HIGH)
{Serial.print(”1”);
}


}


void getFingerprintID()
{


p = finger.fingerSearch();


Serial.print(finger.fingerID);
return finger.fingerID;
}
```