Paper ID: IOTTSF13

Android Based Automatic Rationing System

Najuka patil[1] ,Tushar Nagpure[2], Aparna Kumbhar[3], S. S. Tavse[4]

[1,2,3]Department Of Electronics And Telecommunication

[4]Asst. Prof. Department Of Electronics And Telecommunication

Marathwada Mitra Mandal's College Of Engineeing, Karvenagar,Pune-52

najukapatil.etc@mmcoe.edu.in[1], tusharnagpure.etc@mmcoe.edu.in[2], aparnakumbhar.etc@mmcoe.edu.in[3], sampadatavse@mmcoe.edu.in[4]

***Abstract*—The main objective of this paper is the design and implementation of automation of a public distribution system (PDS). In the conventional ration shop, all the essential commodities are distributed and managed by civil supply corporation to the citizens according to the category of their ration card. This system provides products like oil, wheat, sugar, rice, etc. This includes manual intercession, so there are chances of corruption and illegal use. So to overcome these drawbacks we are proposing an Android Based Automatic Rationing System.**

Keywords—Microcontroller, Fingerprint module,WIFI module, Automation, Smart card reader, GSM module, Android Application.

I. INTRODUCTION

In a conventional ration shop, the government provides monthly groceries to Below Poverty Line (BPL) people. The shopkeeper issues groceries through weighing systems according to the category of the ration card. But this system has drawbacks, the first drawback is the weight of goods could be inaccurate because this system is based on manual work. Also the second drawback is illegal usage of goods, that is, at the end of the month all the leftover groceries are sold by the shopkeeper without any intimation to the customer or government. To overcome these problems we are designing an android based automatic system.

Android based automatic system is an advanced system compatible for automatic and more secure way of grocery distribution. This system will remove all the limitations of conventional rationing system. In our system we have used either smart card authentication or biometric system. Smart card contains the UID (Unique Identification) number of a person. This UID number is called as Aadhar number which is allotted by the government of India, which contains all the basic information of a person. The biometric system identifies the thumb impression of a person which is unique. If the thumb impression matches, only then will the grocery be provided.

In our system, we are designing an android app which will help to simplify the work of the officer. The officer can login through the app and get the information of transactions occurred at every branch. To store the information, we are using cloud based web server, which is a free space available on the web. We are accessing the web with the help of WIFI module.

II. LITERATURE REVIEW

A.N. Madur et al. [1], the heart of this system is ARM7. For identification purpose RFID cards have been used. In this system, first the customer authentication is done by using RFID card and password. After that, system will show remaining quantity of groceries in the customer's account. Person will enter the weight in kg, and then entered weight is tallied with the balance quantity by the system. If the person has sufficient balance, then the valve will be opened and the selected grocery will be dispatched as soon as it reaches the entered value, valve is closed and a message is sent to the customer's mobile with the help of GSM module. But the limitation of such a system is that information is not available to the rationing officer.

Dhanojmohan et al. [2], this system is based on PLC. The hardware which is designed is consisting of a reservoir for storage of commodities. First the customer should enter the quantity using keypad. For displaying information, an LCD is used. A load cell is used for measuring purpose. They have used a resistance type ball float level sensor for sensing the kerosene level. System is controlled using embedded PLC GEFANUC. But the system is costly. Also, the updated database to the government and customer is not provided.

Sukumar et al. [3], this system is consist of three parameters, touch screen, billing printer and GSM module. These parameters are interfaced to PIC microcontroller and PIC is interfaced with PLC and then it is interfaced supplementary to the government database. For authentication purpose, they have used fingerprint module. After authentication, the customer will enter the quantity using touch screen. The touch screen inputs will be first given to PIC microcontroller, and then to the PLC module and then product are collected at ration shop. After the transaction is done, then with the help of GSM module the information is updated to the government database and bill

is generated at the billing counter. The limitation is that, the system is very costly and complicated, as it includes PLC.

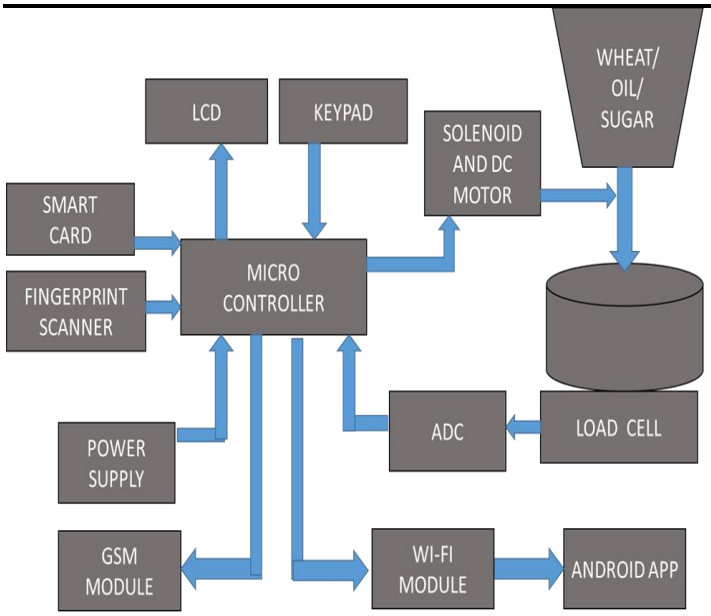
Shivbhakt Mhalasakant Hanamant et al. [4], this system consist of two units. First is main control unit where registration is done and database is stored. At the ration shop second unit is placed. Second unit will control all the activities at shop. The LPC2148 controller is used as the heart of the system. RFID is used for user identification. Solenoid valve is used for dispatching the goods. The message of total transactions is sent to the customer's number with the help of GSM module. This system is beneficial as the database of total transactions occurred at ration shop is provided to the government. The database is stored in SQL server 2008. The main limitation of this system is that, database is updated only at branch level where each server contains information related to that particular branch hence it puts a tremendous strain on the rationing officer, who needs to maintain the log of all branches.

K. Bala Karthik [5], this system consists of PIC Microcontroller. The three main parameters of this system are RFID Module, software module, server module. The RFID module is used for user identification. In this system after authentication user will enter the quantity of goods to be dispatched. After the total transaction a message will be sent to the customer. Then the database is updated on the website. The main limitation of this system is that, database is updated at the website. Every time the higher authorities have to visit website for details. They used two GSM module so it is costly as compared to Wi-Fi module system. Also the RFID system is costly as compared to smart card.

III. Comparision of Automatic Rationing Systems

Sr. No.	Author	Year of Implimentation	Merits	Limitations
1.	A.N. Madur et al. [1]	2013	Unique Identification	Database Unavailable For Rationing Officer
2.	Dhanojmohan et al. [2]	2013	Reservior Available For Storage	System Is Costly
3.	Sukumar et al. [3]	2013	Unique Identification	System Is Complex
4.	Shivbhakt Mhalasakant Hanamant et al. [4]	2014	Database Provided At Server	Unefficient System For Rationing Officer
5.	K. Bala Karthik [5]	2013	Database Is Provided On Website	Complex And Costly System

IV. Proposed Block Diagram



V. System Description

A. Microcontroller: The microcontroller is a main unit of this system. LPC2138 is used as the main controller as it is easily available and programming is also feasible. The microcontroller controls the operation of all the parameters.

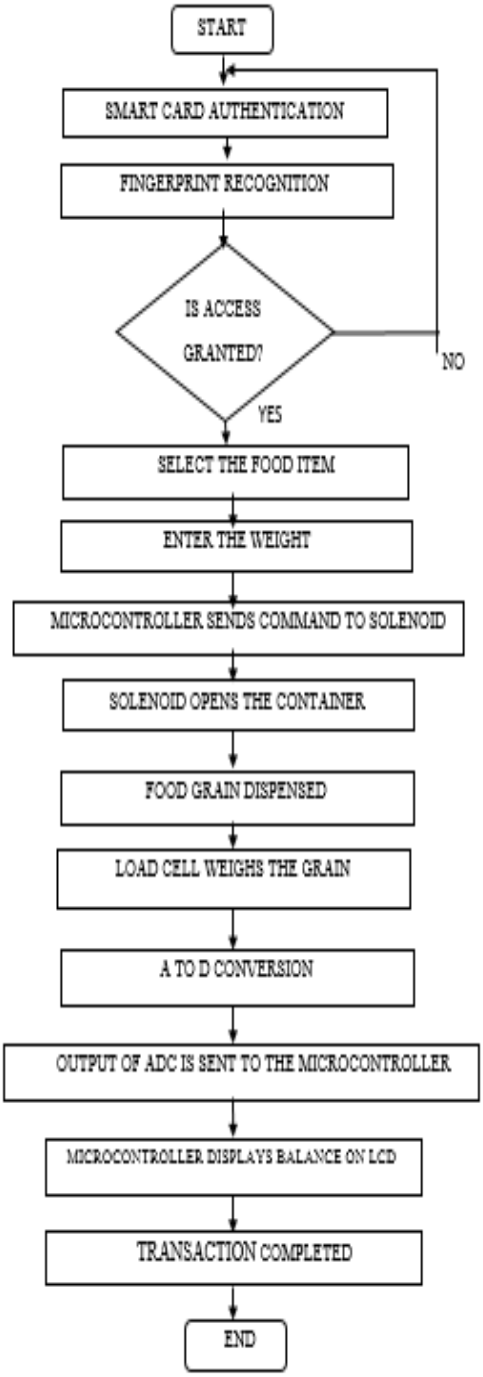
B. Smart Card: Smart card is used for authentication. In this system, a new type of smart card is being developed with the help of memory IC AT24C04. It stores up to 4KB memory. All the details of the user along with the `UID no. are stored in smart card. As compared to RFID card module, smart card is very cheap and beneficial. It provides unique identification as it contains UID number, that is, Aadhar number.

C. GSM Module: It is used for sending message to the customer's mobile. It uses AT commands for this operation.

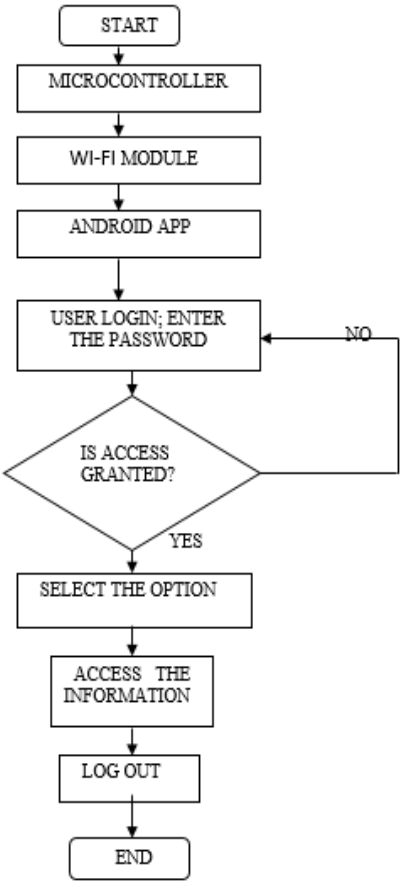
D. WIFI Module: It is used for providing internet to the system so that it can upload the transactions to the database in cloud.

VI. Methodology

A. Flowchart For Hardware



B. Flowchart For Android Application



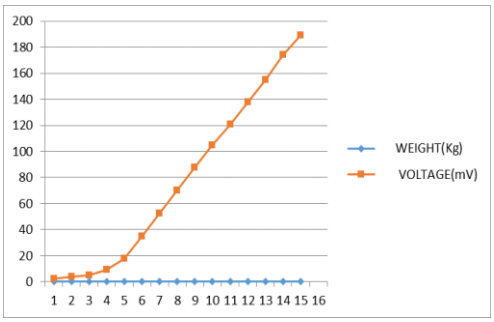
VII. Working

In the hardware part of the system, first the customer will insert smart card in smart card interface, then system will check for authentication. If access is granted, then fingerprint of the customer is verified using a fingerprint module. After the authentication of the customer is confirmed, they can enter the weight of grocery in kg with the help of the keypad provided. The Microcontroller will send the signal either to the motor or to the solenoid depending on the groceries being provided, that is, if the grocery is in liquid state, then solenoid valve will get open, else motor will start rotating and solid grocery will be dispatched through the container and will be placed on the load cell. The load cell will weigh the weight and give the corresponding analog voltage. The transaction will get completed when the customer has finished his purchase. Then GSM Module will send a message of the completed transaction to the customer's phone. As soon as the transaction gets completed, all the details are stored in the cloud server with the help of Wi-Fi module. Android app can be used to access the database. The rationing officer can login through the android app and access the information.

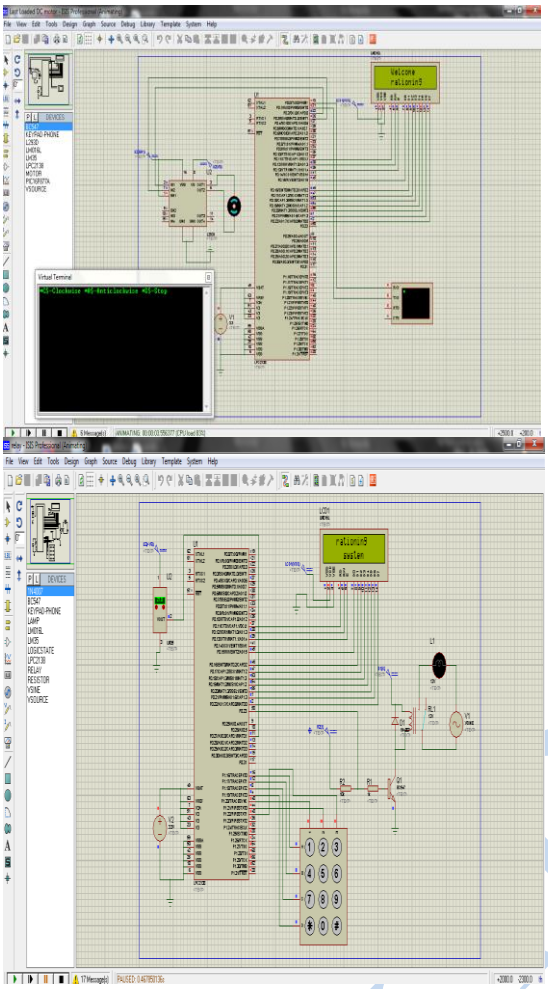
VIII. Results

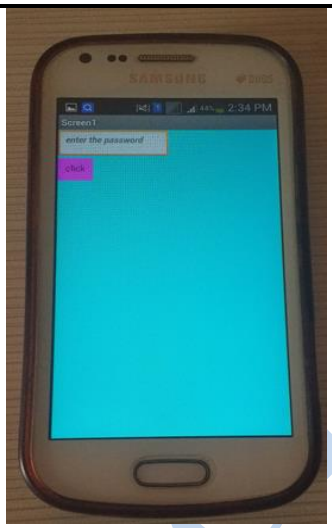
A. Load cell is calibrated and linear characteristics are obtained.

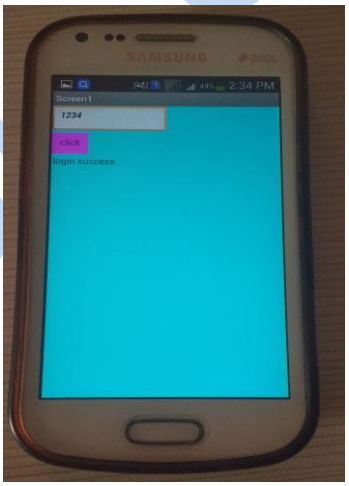
Sr. No	WEIGHT(Kg)	VOLTAGE(mV)
1	100 gm	2.2
2	200 gm	4.1
3	250 gm	5.1
4	500 gm	9.3
5	1 Kg	17.8
6	2 Kg	35.1
7	3 Kg	52.6
8	4 Kg	70.3
9	5 Kg	87.6
10	6 Kg	104.6
11	7 Kg	120.8
12	8 Kg	137.9
13	9 Kg	154.9
14	10 Kg	174.2
15	11 Kg	188.9



B. Simulation results







C. Android Application

IX. CONCLUSION

Android Based Automatic Rationing System will reduce limitations of conventional rationing system. This system provides unique identification with the help of smart card and fingerprint module. Transaction details are provided to the customer through a message with the help of GSM module. Also to simplify the work of the rationing officer, an android application has been developed. In recent scenario, android phones are widely used. The rationing officer can login through the application and can check the details of day-to-day transaction occurred at various branches. Officer doesn't need to visit the branches personally. This system helps to prevent smuggling and illegal use of grocery as it is a fully automated system.

X. REFERENCES

[1] A.N.Madur, Sham Nayse, "Automation in Rationing System Using Arm 7", International journal of innovative research in electrical, electronics, instrumentation and control engineering,vol.1, Issue 4,Jul 2013.

[2]Dhanojmohan,Rathikarani,Gopukumar, "Automation in ration shop using PLC," International Journal of Modern Engineering Research, vol.3,Issue 5,Sep-oct 2013.

[3]S. Sukumar, K. Gopinathan, S. Kalpanadevi, "Automatic Rating System Using ,Embedded System Technology", International journal of innovative research in electrical, electronics, instrumentation and control engineering,vol.1, Issue 8, November 2013.

[4] Shivbhakt Mhalasakant Hanamant, Suraj V. S., Moresh Mukhdekar, "Automization Of Rationing System", International Journal of Computational Engineering & Management, Vol. 17 Issue 6, November 2014

[5] K. Bala Karthik [5], "Cloud Based Ration Card System Using RFID and GSM Technology", International Journal of Engineering Research & Technology, Vol. 2 Issue 4, April - 2013

[6]"ARM System Developer's Guide: Designing and Optimizing System Software, by Andrew N. SLOSS, Dominic SYMES, Chris WRIGHT.