

# E-Rationing using RFID

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## Abstract

**ABSTRACT-***This project is based on the concept of Digital India in which rationing is done digitally with proper record. In this system RFID reader has been used to get ration card number from the RFID tag given to customers. RFID sends the unique ration ID number to the microcontroller. Microcontroller Verify that ration number and if it matches with stored database then the system allows the customer for taking ration, watch the status of the operation on the LCD. Finally the GSM modem connected with the microcontroller sends data log or database to the customer through SMS. So, by this way we can manage the complete ration system smartly and effectively with proper record which results no corruption.*

**Keywords:** ARM, GSM module, RFID Reader, Smart Card, Motor, Solenoid Control Circuits, Mechanical Part, AT Commands.

also. Thus Corruption rises. Respective person can take ration any time like ATM machine. We will have an automated rationing system.

“E-Rationing” means spreading of crucial supplies to public through a system on a periodic basis in an automated way. The apparatus supportive to Govt. of India’s PDS System and to several other disciplines. Here, we are crafting a system where a person shows his/her RFID based ration card and our system provides the Ration to that user. As a result venality is reduced.

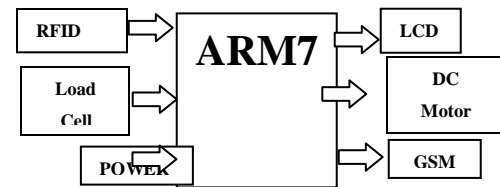


Figure 1: Proposed system

## 1. INTRODUCTION

Rationing distribution is one of the major issues that involves corruption. All these happen because every job involves manual work and there are no specific technologies to automate it. There are lots of illegal stuff occurs i.e. wrong entry in register of shopkeeper, sometimes people do not have idea about how much quantity of good provided by government to them etc. In this paper we propose the concept about to replace manual work in public distribution system (rationing delivery system) by computerized system at the ration shop. In this automated system we replace the conventional ration card by a technique using character recognition of RFID based ration card. Management must have control over all operation happen at ration shop. In present system, we use man power to distribute the Ration like sugar, Rice, Wheat Etc. It will take more time to distribute. And the authorized person may sell ration individual

## 2. LITERATURE REVIEW

Our existing conventional ration system has the basic issues of renewing the ration card every year by the employees to the malpractices done by the ration store dealers like diverting food grains to open market to make profit. To tackle this problem K. Balakarthik proposed the “Cloud-Based Ration Card System using RFID and GSM

Technology” [1], presents an efficient method for the user to buy the products in the ration shop by just flashing the card at the RFID reader. The user authentication is done by sending a random password text to the user mobile which has to be entered in a keypad. The purchase is validated by the employee only after the details are entered in a

windows application which stores the user's personal and purchase information.

The current PDS involves corruption and illegal smuggling of goods because of manual work. A.N. Madur et.al. developed the "Automation in Rationing System using Arm 7" [2], S. Valarmathy et.al. Proposed the "Automatic Ration Material Distributions Based on GSM and RFID Technology" [4]. Here each customer is provided with RFID cards. In this system, first user is authenticated, then system shows the balance of person. User have to enter the amount of Kg he want to withdraw. If the user will have sufficient balance to withdraw the current amount, system will open the valve. Through valve grain will come and it will get weighted by weight sensor. Once the count reached the entered amount controller automatically shut down the valve and updates the account of the customer. The updated account information is send to the customer's mobile using GSM.

Rationing distribution is one of the widely controversial issue that involves wrong entries in stock register of shop containing wrong stock information of the products that is supplied to the public, so Rajesh C. Pingle et.al. Suggested the "Automatic Rationing for Public Distribution System (PDS) using RFID and GSM Module to

Prevent Irregularities" [3], in this automated system conventional ration card is replaced by smartcard in which all the details about users are provided including their AADHAR number which is used for user authentication. To involve government in the process we proposed connecting the system at ration shop to a central database (provided by government.) via GSM and RS232. Hence it is possible to prevent the corruption and irregularities at ration shop.

The existing PDS system causes overcrowding at ration shop due to manual work so

S.Sukhumar et.al. Proposed the "Automatic Rationing System Using Embedded System

Technology" [5], in this the ration distribution system is automated by using PLC. This automated ration system replaces the conventional ration card system by smart card. The proposed ration shop system is connected to the government database via GSM modules, which further sends the up-to-date information to the government and the consumer.

The current PDS having lack of visibility, accessibility, and efficiency in the system so to these factors MahammadShafi et.al. Suggested the "e- Ration Shop: An Automation Tool for Fair Price Shop under the Public Distribution System" [6], this paper discusses strategy adapted in using ICT to control diversion and leakage in the delivery mechanism and its successful application in computerization of food grain supply chain.

### 3. BLOCK DIAGRAM & DESCRIPTION

The block diagram of an Automatic Ration Materials Distribution Based on GSM and RFID Technology is shown in the Fig.

*Figure 2: Block diagram of ration materials distributions system*

#### Power Supply

The power supply is most important for electronic circuits, which provide the required

power to the ARM7 and other electronics devices. For this system we are using +5v power supply for buzzer,LCD, keypad, MAX232, L293D. Also we required 3.3 v power supply for ARM7 which is obtained by LM1117. For Relay and DC motor 12v supply is required which is taken from rectifiers output.

### **RFID Module**

Radio-frequency identification (RFID) based access-control system allows only authorized persons to get the materials from ration shops. An RFID system consists of an antenna or coil, a transceiver and a transponder electronically programmed with unique information.

RFID tags consists of a microchip connected to an antenna, which is constructed of a small coil of wires. Data is stored in the IC and transmitted through the antenna to a reader. Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal.

A reader is basically a radio frequency (RF) transmitter and receiver, controlled by a microprocessor. The reader, using an attached antenna, captures data from tags, then passes the data to the microprocessor for processing. As the database of the user is stored in the RFID tag, it will be transmitted through antenna to the reader. Reader will access the data and send it to the ARM7 microcontroller.

### **MAX232**

MAX232 IC chips are commonly referred to as line drivers. The voltage levels of MAX 232 are 0 to +5 volts. The MAX 232 is TTL to CMOS converter

and also CMOS to TTL converter and thus making the system compatible with PC.

MAX232 is used for the serial communication between other devices and microcontroller. In proposed system MAX232 is used to connect RFID reader serially with ARM7.

### **ARM**

LPC2138 (ARM7) is actual processing unit for proposed system. The 12 MHz crystal oscillator is used to provide the required clock signals to the ARM7. It takes input from power supply of 3.3V for its operation.

In the proposed project RFID reader reads the database stored in the tag and send it to ARM7. The database of all the users will be already stored in ARM7. The data coming from RFID reader will be matched with the stored data in ARM7. If it is matched with stored data then it will show the data on display. Then using keypad enter the amount required for the user. Then ARM7 will send the signals to motor driver circuit and solenoid valve for the withdrawal of material. If material is unavailable in the storage container then ARM7 will send signal to the buzzer.

### **Keypad**

In proposed system 4x4 matrix keypad is used. It is serially connected with the ARM7. After showing the smart card by authenticated person, if material is available in the users account then with the help of keypad user can take the required amount of material.

### **Liquid Crystal Display (LCD)**

A liquid-crystal display is an electronic visual display that uses the light modulating properties of liquid crystals. A 16x2 LCD means it

can display 16 characters per line and there are 2 such lines.

In the proposed system if the database in the tag get accessed by the reader then after processing it will be shown on LCD display. After checking the database of the user the balance material of the user will be shown on LCD display and it will ask to select the quantity required for the user. After withdrawal of material it will ask to show the card for next user.



Figure 3: 16x2 LCD

## Output section

- **Solenoid valve**

A solenoid valve is an electromechanically operated valve. The valve is controlled by an electric current through a solenoid. In proposed system we are using two solenoid valves for kerosene and palm oil. These valves will be controlled by solenoid valve controller circuit. The actual withdrawal of material takes place here.

- **Motor with Driver Circuit**

The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion. In the proposed system we are using motor for the withdrawal of sugar or rice. The motor driver circuit is used to provide proper matching between motor and circuits.

## Buzzer

It consists of piezo crystals between two conductors. When a potential is applied across these

crystals, they push on one conductor and pull on the other. This, push and pull action, results in a sound wave.

If the RFID tag is invalid then ARM7 will send signal to the buzzer. Buzzer will receive the signal coming from ARM7 and it will produce some noisy sound.

## GSM

GSM stands for Global System for Mobile communication. GSM is a globally accepted standard for digital cellular communication. GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz frequency band. GSM modem is a wireless modem that works with a GSM wireless network

After distribution of the materials controller send the information about the distribution of material to government office and customer through GSM technology. This would bring the transparency in public distribution system as there will be a direct communication between people and Government.

## 4. Software requirement

The design of our printed circuit board has been done using EAGLE. EAGLE software is a complete electronic design automation system for PC compatible computer. It includes schematic and PCB module. The  $\mu$ Vision IDE from Keil combines project management, make facilities, source code editing, program debugging, and complete simulation in one powerful environment.

## 5. FLOWCHART

5) Check the information about the card and status  
Y indicates availability of material.

1. If Y=0, go to step 3.

2. If  $Y=1$ , go to the next step.
- 6) Check for keyboard input. change in PDS and provides benefit to the government by sending the current stock information.
3. Milk dispensing system, In Agricultural.
4. Petrol distribution system.

#### **RESULT:**

User 1

Card no. 885764

Balance material: Rice- 16kg, Oil- 8 liter

Delivered material- 4:36pm, 12/1/2015

Rice- 5kg, Oil- 3 liter

Balance material: Rice- 11kg, Oil- 5 liter

User 2

Invalid ID

Turn ON buzzer.

In traditional ration card system, customer can take his quota by showing ration card at shop at once, but in this system, by using RFID, first user is authenticated, then system shows the balance of person. User will enter the amount of Kg he want to withdraw. System checks his account. If the user will have sufficient balance to withdraw the current amount, system will open the valve. Through valve grain will come and it will be put on weight sensor. Once the count will reach to the entered amount controller automatically shut down the valve and update the account of the customer. We can send this update account information to customer's mobile using GSM module.

Figure 4: Overall Ration Distribution System with Mechanical Parts

#### **CONCLUSION**

“57% of the public distribution system (PDS) food grain does not reach the intended people”[10]. Many drawbacks of PDS like PDS leakage, scale & quality issue, system transparency and accountability, grievance redressed mechanism are overcome by automation

So we have decided to develop a system in which ration material distribution through automatic mechanism without any human efforts. So this project would create the transparency in Public Distribution System (PDS) as the work becomes automatic. With the help of this it is possible to make Public Distribution System (PDS) efficient and free from irregularities.

#### **Scope of work**

1. The same system with existing components can also be used for keeping Employees record in multi-branch organizations. It is possible by creating common database for multi-branches.
2. It can be also carried out for various remote security applications as hardware requirement is same; the difference is that some relay and sensors need to be attached.
3. This system can also be implemented using solar panel to provide power requirement.
4. The same system can be implemented by using GPRS which is capable to access the data base of customer also outside the home town.

**REFERENCES:**

- [1] K.Balakarthik, "Closed-Based Ration Card System using RFID and GSM Technology," vol.2, Issue 4, Apr 2013.
- [2] 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.
- [3] Rajesh C. Pingle and P. B. Borole, "Automatic Rationing for Public Distribution System (PDS) using RFID and GSM Module to Prevent Irregularities", HCTL Open International Journal of Technology Innovations and Research, vol 2,pp.102-111,Mar 2013.
- [4] S.Valarmathy,R.Ramani, "Automatic Ration Material distributions Based on GSM and RFID Technology," International Journal of Intelligent Systems and Applications, vol 5,pp.47-54, Oct 2013.
- [5] S.Sukhumar, K.Gopinathan, S.Kalpanadevi,