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Cashless Automatic Rationing System by Using GSM and RFID Technology

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Abstract - *An RFID based cashless automatic ration shop is novel approach in public distribution system (PDS) useful for more efficient, accurate, and automated technique of ration distribution. Public distribution system also called rationing distribution system is one of the widely controversial issues that involve malpractices. The present ration distribution system has drawbacks like inaccurate quantity of goods, low processing speed, large waiting time, material theft in ration shop. The proposed system replaces the manual work in ration shop. The main objective of the designed system is the automation of ration shop to provide transparency. The proposed cashless automatic ration shop for public distribution system is based on Radio Frequency Identification (RFID) technology that replaces conventional ration cards. The RFID tags are provided instead of conventional ration cards. Customer's database is stored in microcontroller which is provided by Government Authority. Customer needs to scan tag to RFID reader, and then microcontroller checks customer's details with stored to distribute material in ration shop. After successful verification, customer needs to enter type of material as well as quantity of material using keypad. After delivering proper material to consumer, the microcontroller sends the information to customer as well as PDS authorities using Global System for Mobile (GSM) technology.*

Key Words: Atmega 16 Microcontroller,16X2 LCD Display, RFID Reader, 1x4 Keypad, Relay, Motor, Pump, GSM.

1. INTRODUCTION

The most of the people having a ration card to buy the materials from the ration shops. When get the material from the ratio shop, first need to submit the ration card and they will put the sign in the ratio card depends on the materials. Then they will issue the materials through weighting system with help of human. But in this system having two draw backs, first one is weight of the material may be inaccurate due to human mistakes and secondly, if not buy the materials at the end of the month, they will sale to others without any intimation to the government and customers. In this project, we have proposed an Cashless Automatic Ration Materials Distribution Based on GSM and RFID Technology to avoid the drawbacks. Today we are facing a number of transport related problems. RFID technology effectively used to solve some of them. RFID is act as ratio card and other purpose such as RC book, insurance details, service details etc. GSM used to communicate the information between the two people or more than two persons to update the information depends on the requirements.

Ration system is based on GSM module. A proper study and implementation of this project can be used for various applications. It is a classic example of wireless communication. The wireless communications industry is one of the fast growing industries. Over the past few years, there has been an explosive increase in the ration system. Which are used to send the message to card holder mobile number and ration system information can be send through it and message will be send to the government to maintain record which are automatically updated for every transaction made by the user

1.1 AN OVERVIEW ON SOME PREVIOUS RATIONING SYSTEM

Government provides various facilities to poor and people below poverty line but such facilities do not reach up to needy and poor people due to corruption present in the chain. One of such facility provided by government is rationing material distribution. All the people having a ration card to buy the various materials (sugar, rice, oil, kerosene, etc.) from the ration shops. These materials has to be taken from the shopkeeper at one time. If it is not taken by any card holder then there is no monitoring of such unused material. So the shopkeepers are doing miss use of these things by selling in the market and doing the fraud. So a central monitoring system is required which is to be linked with government offices, shopkeeper and the ration card holder. In this project we proposed one such system which is developed by using GSM and RFID. Which will take care of all the activities related for avoiding illegal work made by authorized people and help to overcome the problems in this concern area.

2. PROPOSED SYSTEM

The proposed system on the basis of cashless automation. The heart of the system is the Atmega16 microcontroller. The RFID is the first step of this system. RFID act's as ration card. RFID card number is stored in data base. RFID scanner identifies the card holder name and ration detail of card holder. And the OTP will be generated to

card holder mobile number (for security purpose) after entering the OTP in the keypad. Name of the card holder and ration detail will be displayed in the LCD display. The user can now enter the amount of ration he want to withdraw by using the keypad. In the second step RFID card act's as (cashless card) as per the customer withdraw of ration. Amount will be automatically cutted in the RFID card. After the amount will be cutted the value of the system open to provide the commodities of ration material. Ration current balance and current withdraw balance are send through GSM for customer and government database. In this corruption and drawback of ration system can be decreased. Cost effective approach, time saving approach, compact in size. Effectively distributing ration for people this proposed method can provide a safe, secure and efficient way of public distribution system. And main scope of this project is CASHLESS.

3. METHODOLOGY

3.1 Block Diagram

Fig 1. Shows The Block Diagram Of Cashless Automatic Rationing System By Using GSM And RFID Technology. System Consisting Of Atmega16 Microcontroller, LCD Display, Power Supply Unit, Relay, Motor Driver Circuit, RFID Card, RFID Reader, Buzzer, Keypad, GSM.

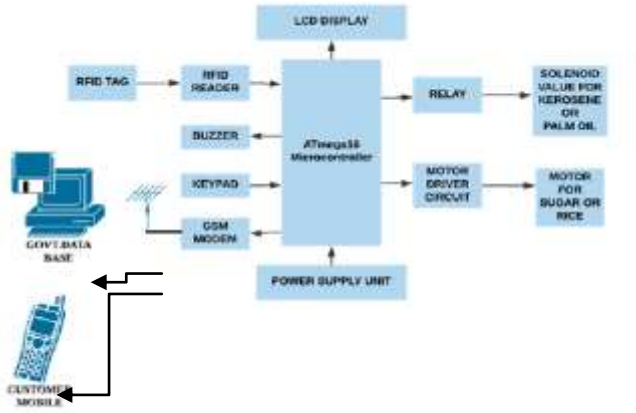

Fig -1: Block Diagram of Cashless Automatic Rationing System

The proposed system demonstrates distribution of solid as well as liquid costumer materials that is grain(wheat/rice/ sugar) and kerosene (palm oil). RFID card, keypad, power supply unit act's as input device. Buzzer , GSM, relay, motor driver circuit, solenoid value act's as output device. LCD display act's as both input and output device.

3.2 FLOW CHART

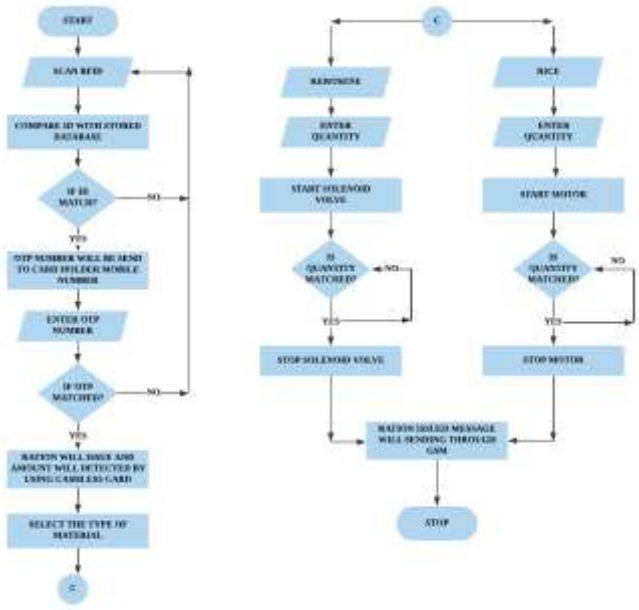

Fig-2: System Flowchart

3.2.1 System Flowchart Working

Step 1: Start.

Step 2: Scan RFID CARD.

Step 3: Compare Scaned RFID NUMBER With Stored Database

Step 4: If Scaned RFID NUMBER With Stored Database Is Matched Generated OTP Number Will Be Send To Card Holder Mobile Number.

Step 5: If Entered OTP NUMBER Matched, Ration Will Issue And Amount Will Detected By Using Cashless Card Else Go To Step 2.

Step 6: Choose The Items Do You Want.

Ex: Kerosene, Sugar, Rice Etc.

Step 7: Enter The Quality Of The Choosed Items.

Step 8: If We Select Kerosene Solenoid Value Is Opened And Level Sensor Detected The Quality Level. If We Select Rice Or Sugar, The Motor Is Start To Rotate.

Step 9: If Quantity Matched, Solenoid Value And Motor, Will Stop. Else Repeat Step 9.

Step 10: Ration Issued Message Will Sending Through GSM To Card Holder.

Step 11: Stop.

4. Result table and entire circuit diagram

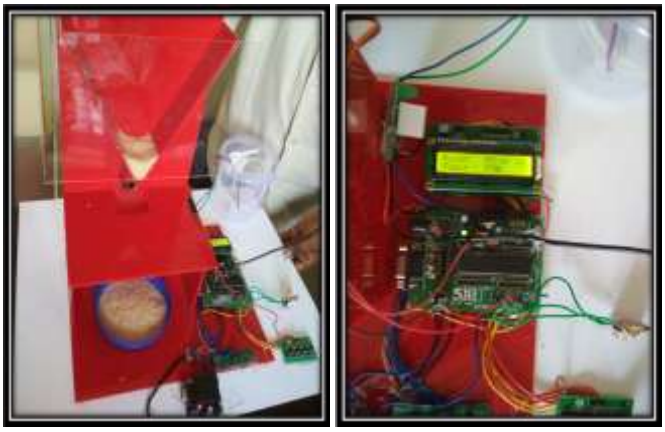

Fig - 3: Shows The Entire Circuit Diagram.

Fig - 4: Shows The Result Of Ration Distribution System

SL.NO	SELECT THE QUANTITY			
	Current balance select the Of rice and Quantity do you and want to withdraw Oil and rice + oil amount balance		Automatic detected amount	Remaining balance of ration
1.	Rice=15 Oil=10 Amount=120rs	Rice=5kg Oil=5ltr	detec=30Rs	Rice=10 Oil=5lt

Fig -5: shows the tabular column

5. CONCLUSION

Project, we have implemented and tested an cashless automatic ration materials distribution based on GSM and RFID technology instead of ration cards. But in the existing system having three draw backs, first one is weight of the material may be inaccurate due to human mistakes and secondly, if not buy the materials at end of the month, they will sale to others without any intimation to the government and customers. The above drawbacks rectified by this method. In this system, ration materials (sugar, rice, oil, kerosene, etc.) distributed through automatic mechanism without any help of humans and current amount will be cutted through RFID CARD(cash less card). After receiving the materials, controller sends the information to government office and customer through GSM technology. This system is very accurate, simple and low power consumption, which is used for the real time applications

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