AUTOMATIC RATION MATERIAL DISTRIBUTION USING RFID AND GSM

Joncil Niha Dsouza, Nathasha Pearl Tauro, Mr. Raghavendra Rao P

Abstract— In this paper we have proposed a ration card using RFID (Radio Frequency Identification Device), biometric and GSM. The RFID tag will consist of the unique ID and details of the family members to whom the ration will be distributed. The user needs to swap the tag in the ration shop and also have to provide thumb impression on the bio metric machine. If the user found authentic, the quantity and the ration which is required is selected through the keypad and displayed on the LCD display and the commodity is provided to the customer. This RFID card is free from theft and forgery as the information about the delivered ration will be sent directly to the government and customer through GSM.

Index Terms—RFID Tag, RFID Reader, Biometric Scanner, Solenoid, Relay, GSM

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1 INTRODUCTION

IN India Ration card is one of the most important document from all the other documents. The ration card is mainly used for purchasing subsidized food stuffs and fuel. The public distribution system was launched in India on June 1997.In India approximately 500000 fair price shops are available. Here the major commodities distributed include essential food grains such as wheat, rice, sugar and kerosene. The Ration cards are used in identification process while making Aadhar card, passport, PAN card and at as an address proof for citizen of India.

The central and state government joints the responsibility of regulating the PDS.while the central government is obligated for procurement, storage, conveyance, and majority allocation of food grains. State government holds the province for distributing the aforesaid to the consumers through the ingrained network of fair price shops.

The ration cards are divided as below poverty line (BPL), above poverty line (APL), Antyodaya (AAY).The poverty lines are identified depends on the annual income of that particular family. Below poverty line correspondence bearer should collect 35kg of food grain and card holder above the poverty line should collect 15kg of food grains as per the norms of PDS. The present ration distribution system has many drawbacks such as inaccurate quantity of goods, manual work, low processing speed and large waiting time and redundant data also there will be forgery by providing ration under false name and duplicate name from other areas. They also tend to show false amount of goods available in ration shops to higher authority person. Hence there is a need to improve our current corrupt ration distribution system.

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Our proposed system eliminates the drawbacks of existing system by making use of RFID and Bio metrics technique. RFID tag is used to find the information about customer and ID is used for confirming about the family details. Bio metric technique is used to authenticate the users as the bio metric details are unique for each person, even for identical twins. RFID tag is given to a registered user which is used as ration card. Each ration shop will have a RFID reader to which the tag is swiped .whenever the user swipes the tag it checks for the validation of ID.Further the user is authenticated by the bio metric process. The user then selects the required commodity and the amount required through the keypad the automation process will takes place. The amount taken and the remaining amount is displayed in the LCD. Further the details will be updated to the government and informationis also provided to the customers registered number through the GSM via SMS.

2 METHODOLOGY

2.1 Block diagram

Block Diagram constituting the entire process is presented in Fig. 1.This showsthe major parts of the developed System where each segment would be described in detail in the following sections.The working of the proposed system is divided into sixmodules.

A. INPUT

A user flashes RFID tag across the RFID reader, reader reads the data and directly transmits the data to the microcontroller. Microcontroller is the core of the system to which other components are connected. When RFID tag is flashed through the reader it confirms the user ID if the ID is not matched then tag need to be flashed again. The keypad that is used as the input for the microcontroller for the selection of the quantity of kerosene required from the monthly quota.

B. AUTHENTICATION

Once the user ID is confirmed the bio metric process will takes place which is used for the authentication purpose. If the user is authentic, then the process of automation will continue. If the authentication fails the process need to be started from the flashing of the RFID tag to the reader.
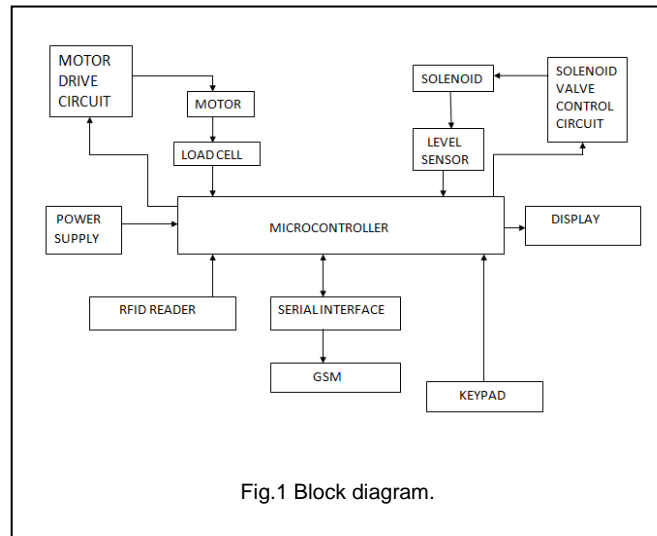

Fig.1 Block diagram.

C. PROCESSING

Microcontroller ATMEGHA328 is used for interfacing with the components connected to it. Microcontroller receives the data from the reader and bio metric unit at the receiving pin. Then it processes the ration card data and verifies with the database. If it found the user authentic the automation process of kerosene will continue.

D. AUTOMATION

As the authentication process confirmed, the user need to select the quantity of kerosene required using the keypad. The relay which is an electromagnetic device which is used to drive the load connected across the relay. The proximity sensor which is connected to the kerosene container which helps in checking the presence of kerosene in the container. If kerosene is present the LED will be off else it will glow indicating that the kerosene in the stock is empty. The solenoid driver is used to drive the relay which drives the load connected across it. The automatic pouring of the kerosene will takes place based on the quantity selected. Battery is used to avoids the noise creation by the solenoid motor and hence the kerosene is dispensed to the customer automatically.

E. DISPLAYING SYSTEM

LCD display shows the message of the authentication process of user ID and bio metric process and also the details about the selection of kerosene and its quantity. It gives the information of quantity of kerosene dispensed and the remaining quantity from his/her monthly quota.

F. MESSAGING SYSTEM

The details such as quantity of kerosene purchased by the user and the remaining quantity from the user's monthly quota is sent to the registered mobile number of the user through the GSM via SMS.
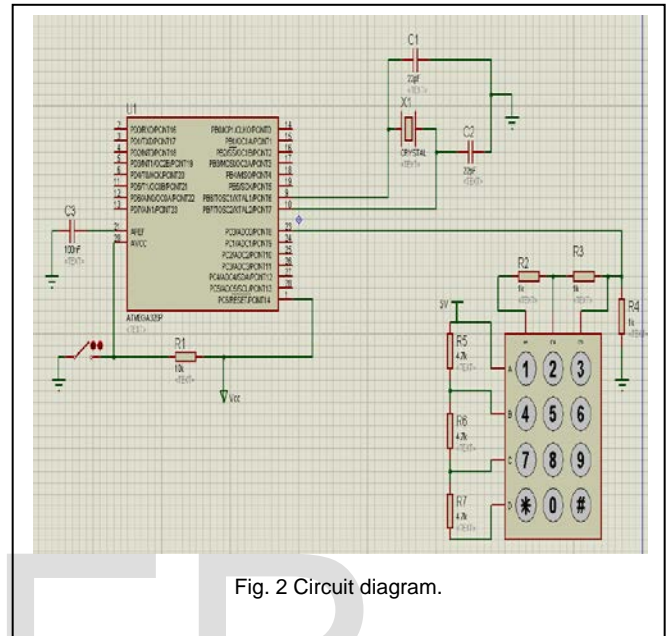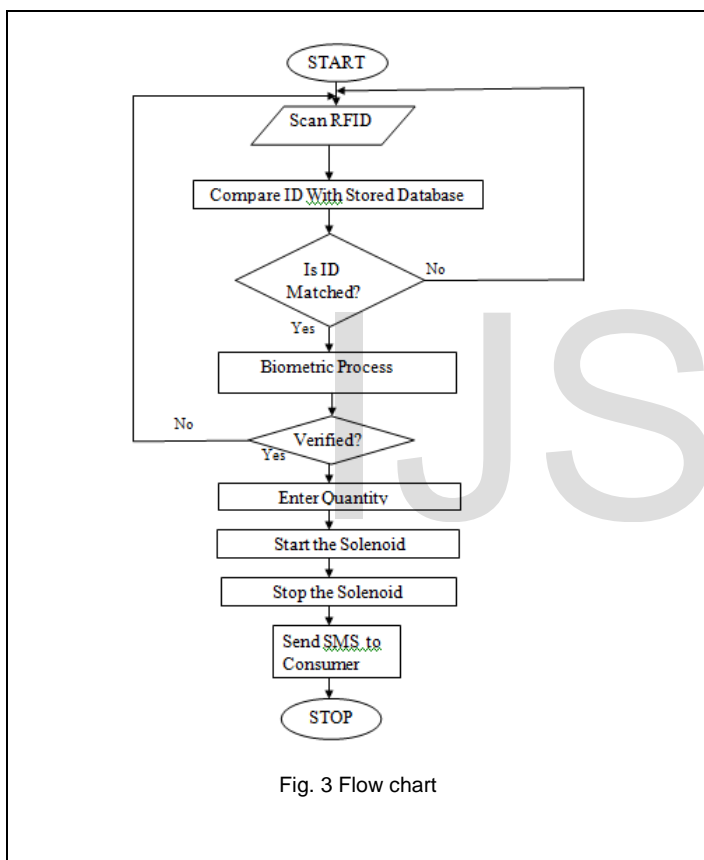
2.2 Circuit diagram

Fig. 2 Circuit diagram.

The circuit diagram of automated ration system has shown in Fig 3. The circuit consist of RFID,GSM module and power supply etc and shows the way in which they are connected to one another.The circuitdiagram of Automaticration distribution system is shown in Fig 2.It consists of LCD, transmitting pinof the RFID reader is connected to the pin 18 of Atmega328microcontroller sothat the reader transmits the 12 bit hex code to the Microcontroller and microcontroller transmit this hex code to the GSM by connecting the pin 3 of Atmega328 microcontroller to the receiving pin of the GSM.The GSM is the one which helps in sending the information about the quantity of kerosene given in the ration on the registered number. A 4*3 keypad is connected to the pin 23 of Atmega328 microcontroller which is used to enter the quantity required. A LCD 16*2 is connected to the pins 5,6,11,12,13,14 of Atmega328 microcontroller which is used to display the quantity taken and the remaining quantity and also for displaying authentication process. The 5V power supplyis connected to VCC pin. The ground pin is grounded.

2.3 Flow chart

A Flow Chart constituting the entire process is presented in Fig. 3.The RFID tag is flashed to the RFID reader the reader reads the information from the tag and accesses its uniquebit hex code. The user ID is then matched with the database and if

the information of the customer is in the database then the display system (LCD) displays as the user ID is verified. If it fails to match the user ID then the tag is flashed again. The authentication process will takes place by taking the finger print using biometric scanner and matching it with the stored database. If the authentication fails RFID tag is need to be flashed again. If the user is authenticated the system will ask for entering the quantity of kerosene required based on the monthly quota of the user. The solenoid motor gets activated and it deactivates depends on the timer section. Once the material is withdrawn the GSM unit will send the message tothe customer about the quantity of kerosene poured and the remaining quantity from his/her monthly quota.

Fig. 4 Overall Developed System

Fig. 3 Flow chart

Fig. 5 Initialization and waiting for user id input

Fig. 6 Flashing of RFID card

3 RESULTS

The system which we have proposed is accurate, fast and secure. In existing system, ration sheets, manual entry in the government record dairy is used. In the proposed system RFID Cards is used as Ration cards hence the experimental results show that the proposed system is easy to access and prevent the ration from theft activity.
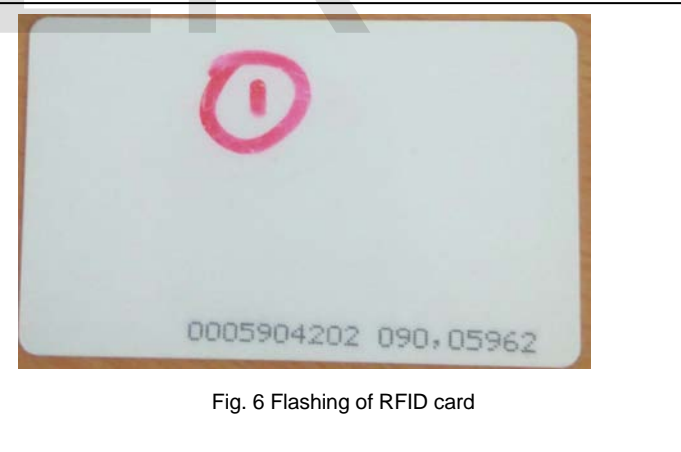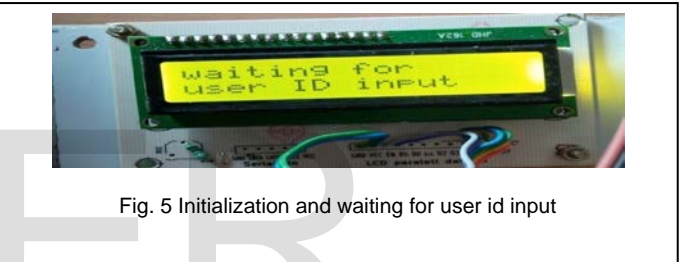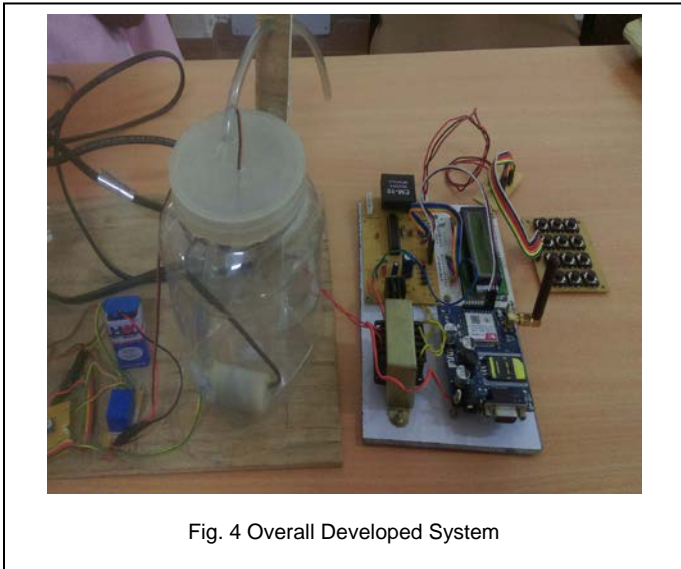
Fig 5 and Fig 6.shows the Initialization Process in which The LCD displays waiting for the user ID Then
User has to flash the RFID Tag which acts as a ration card against the Reader. The information from the RFID Tag.
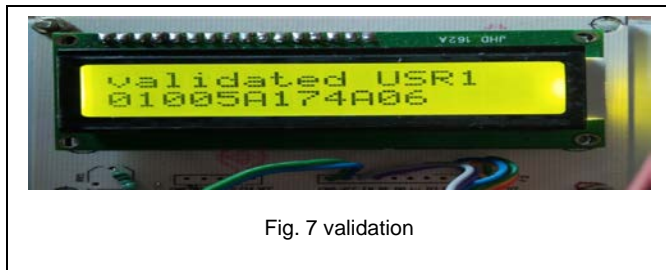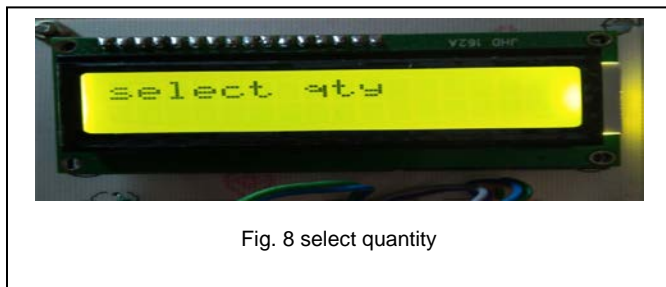
Fig. 7 validation

Fig. 8 select quantity

Fig 7 Shows the validation process in which after the card is flashed, RFID Reader will access its unique 12 bit HEX Code. It will compare the ID with stored database. Fig 8 shows about the selection of quantity, after the validation is done the amount of quantity is been selected by user using the keypad.
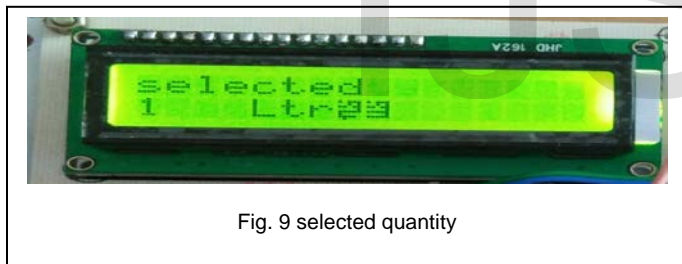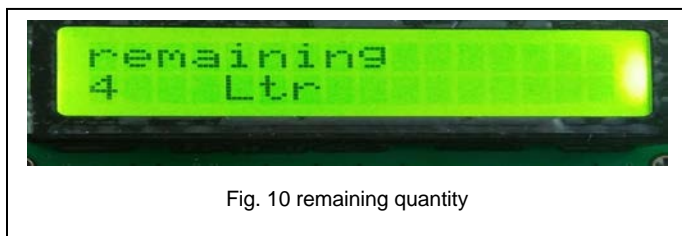

Fig. 9 selected quantity

Fig. 10 remaining quantity

Fig 9 and Fig 10 Shows the selected and remaining quantity which depends on the amount of quantity that has selected, the consumer is given with commodities and then it deducted from his/her monthly quota. Remaining quantity is also displayed on the LCD.

Fig. 11 Text message through GSM

Fig 11 Shows the Text message through GSM, which includes the details about the quantity of kerosene purchased by the user and the remaining quantity from the user monthly quota, has sent to the registered mobile number of the user through the GSM via SMS.

4 CONCLUSION

In this paper, we have proposed a model for ration Card by using RFID, biometrics and GSM Technology. In the current system, there is a drawback of ration forgery. So, in proposed system we are replacing the manual entries and thereby reducing forgery. As we are using RFID card which contains detail information of user with his/her thumb impression thus there is very less chances to misuse the Ration card. Also, the system will send the message to the users registered number about the ration taken and the remaining ration based on the monthly quota.

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