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SMART RATION CARD DISPLAYING TECHQUIE

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ABSTRACT

Smart ration card using Radio Frequency Identification (RFID) technique to prevent the ration forgery as there are chances that the shopkeeper may sell the material to someone else and take the profit and put some false amount in their records. Weight scale technique is introduced. If weight scale is loaded with some weight by new arrival of ration items an alert message is send to every customer before they come to ration store. RFID tag is used that carries the family member details and the customer needs to show this tag to the RFID reader. The microcontroller connected to the reader will checks for the user authentication. If the user is authentic then the quantity of ration to be given to the customer according to the total number of family members will be displayed on display device. The LCD will also display the amount of quantity according to the customer's family. This smart ration card is free from theft as the information about the delivered ration will be send directly to the customer without manual feeding using Global System for Mobile Communication (GSM) technique.

KEYWORDS

GSM, LCD, Microcontroller, Weight Scale RFID

INTRODUCTION

Ration card is a very necessary document for every citizen in India. Ration card is used to purchase various necessary items like sugar, oil etc. from the ration shops at a cheer rate, issued by the government. This ration card also acts as address as well as identity proof. Ration card is needed when you apply for passport, PAN number, driving license etc. Hence, ration card is a very important document. But, the current ration card system has a drawback, that if the items are not sold up to the last of the month, then the shopkeeper will sell it to someone else and take the profit into his pocket and put some false reading in the government record diary. So to avoid this, we move to smart ration card using displaying technique. Weight Scale is introduced. New arrival of ration items is weighted by the weight scale and an alert message is send to all customer. Every customer has given a RFID tag which acts as the ration card. This RFID tags has all the information of the customer, needed for taking the ration from the ration shops. The customer has to show this RFID tag to the RFID reader, which is attached to a microcontroller, which reads the information in the tag and details about amount of ration items allocated for corresponding card holder display on the LCD display. Then the GSM is used to send the information of ration taken to the customer. Radio Frequency Identification (RFID) is the wireless technology to read electromagnetic fields of the radio frequency. The basic purpose to use RFID is to automatically identify and track the attached electromagnetic tag. RFID used in this paper is RKI-1512.This module directly connects to ATMEGA-328 microcontroller. This RFID Reader Module works with any 125 KHz RFID tags. Global System for Mobile Communication (GSM) is a European Telecommunication standard which is used to define the protocols of second generation. In this paper, we use GSM 900A. This GSM works on 12V, 1A dc source.

BACKGROUND

Ration card was first time introduced in India during World War II to supply food grains, sugar and kerosene oil at a relatively cheaper rate. Ration card acts as the address/identity proof of a person. It

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includes the identity of the person along with his family members, their names, ages, gender. According to number of members in the family, ration will be given the manual ration card that is commonly used now is shown in the fig 1 below.in that proportionate ratio.

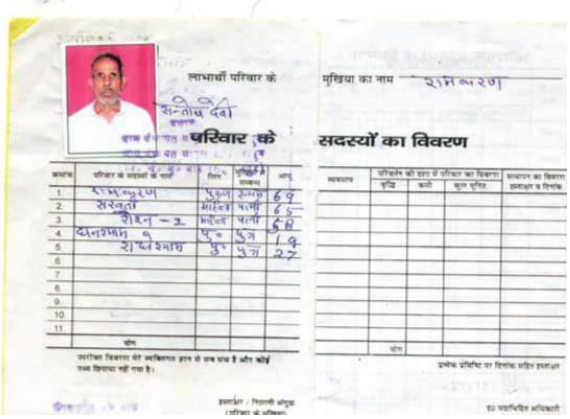

FIG 1 pictorial representation of current ration card

In this paper, we have developed a smart ration card system using RFID and GSM technique which removes the drawback of the current ration distribution system. In this system, only authentic person can get the ration from the ration shops based on the amount available in their RFID. The block diagram, flowchart and circuit diagram is discussed in section III. Working is explained in section IV and section V and VI contains the result and conclusion.

PROPOSED SYSTEM

BLOCK DIAGRAM

The block diagram of smart ration card is shown in fig 2. In smart ration card system, we use an ATmega8 microcontroller, 16x2 LCD, Power supply, RFID reader, RFID tag and GSM module.

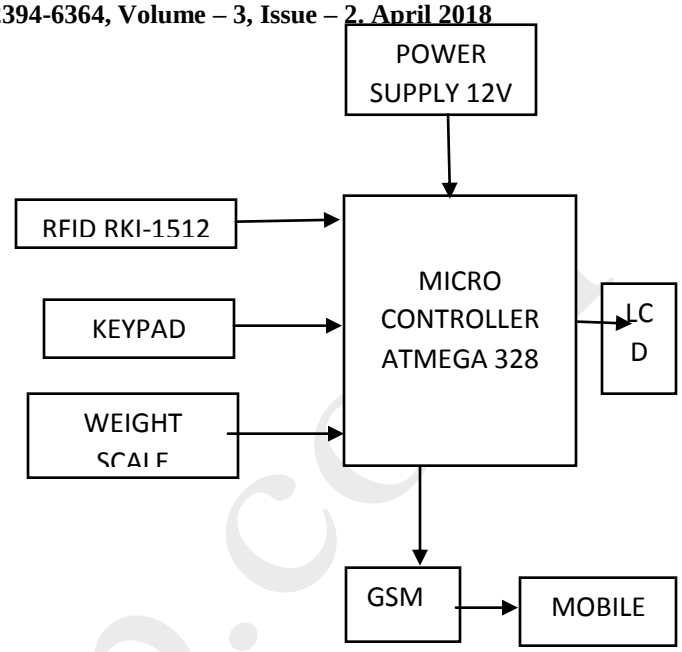

FIG 2 Block diagram of smart ration card

In this system, the transmitting pin of the RFID reader is connected to the receiving pin of the microcontroller and the transmitting pin of the microcontroller is connected to the receiving pin of the GSM module, which is used to send the information about the delivered ration. Since, GSM works on 12V, 1A dc source. Hence, we need an adapter to provide 12V, 1A dc for the GSM module. As we connect this adapter to the GSM module, 12V supply flows in the circuit. But our microcontroller works on 5V, hence we need a power supply which converts 12V to 5V. Hence, this power supply is connected to the microcontroller. Here, 16x2 alphanumeric LCD is used for the display of information. Here, the RFID tag acts as a ration card. It is used to swipe through the RFID reader which in return generates a 12 bit hex code.

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CIRCUIT DIAGRAM

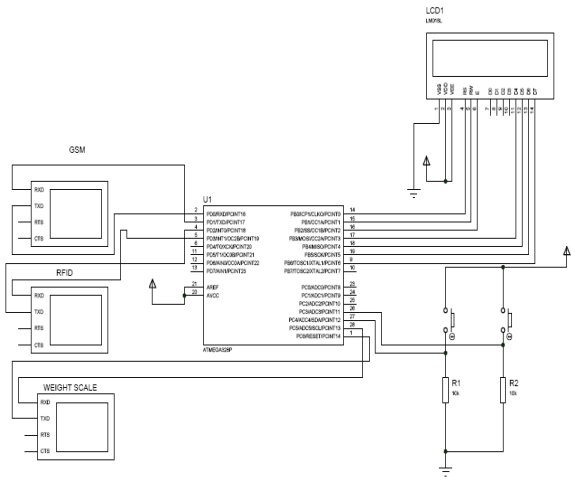
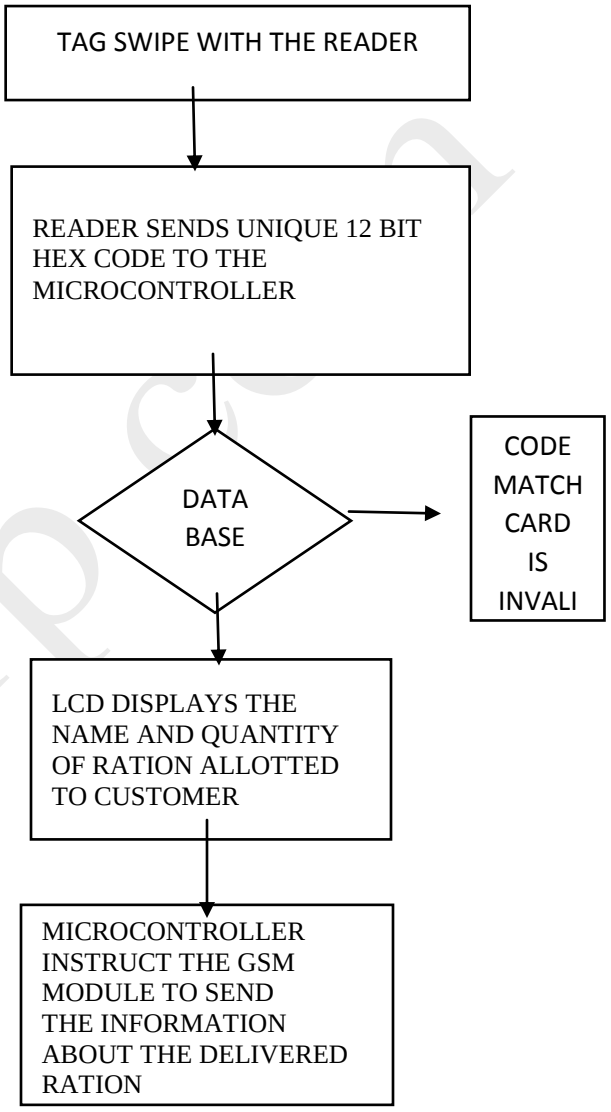


FIG 3 Circuit diagram of smart ration card

The circuit diagram of smart ration card is shown in fig 3 which show the connectivity of the microcontroller to other components like LCD, RFID, GSM module and power supply etc. and shows the way in which they are connected to one another. The transmitting pin of the RFID reader is connected to the pin2 (receiving pin) of the ATmega8 microcontroller so that the reader transmits the 12 bit hex code to the microcontroller and microcontroller transmits this hex code to the GSM by connecting the pin 1 (transmitting pin) of ATmega8 microcontroller to the receiving pin of the GSM, which help in sending the information about the delivered ration on the registered number and the Vcc pin is connected to 5V power supply while the ground pin is grounded as shown in fig 3.

FLOW CHART

When RFID tag is swapped with the reader, the reader reads the information from the tag and accesses its unique 12 bit hex code. This code is then matched with the database and if the information of the customer is in the database, then the display system (LCD) will display the name and the amount of ration allotted to this customer. After the delivery, the microcontroller will instruct the GSM module to send a SMS to the registered number of the customer about the delivered ration as shown in fig 4.



WORKING

The working of the smart ration card is divided into four parts-

1. **Input part**

RFID tag which acts as a smart ration card, when swapped by any customer with the RFID reader, then reader reads the ration card and directly transmits the data directly to the microcontroller (our processing part). The way in which the

RFID reader is connected to the microcontroller is shown in fig 4. Each RFID tag develops a unique magnetic field which when comes under influence of the reader's field; the reader generates a unique 12 bit hex code.

2. Processing

The receiving pin of the microcontroller received the data from the RFID reader. The microcontroller process the ration card data and match the ration card details with the database and process it. If it is found authentic, then the process for the displaying and messaging system starts, otherwise it shows an error that the card is invalid.

3. Displaying system

If the data is found authentic, then the system process for display the name of the ration card holder and the quantity of ration allotted to the customer.

4. Messaging system

Once, ration card is approved and delivery has been done, the message of information delivery of ration is send to the registered number of the customer so that if any forgery happen with the card, the customer can take the action or inform to the ration department.

EXPERIMENTAL RESULT

We have found that our proposed system is fast, accurate and secure. The experimental results show that the proposed system is easy to access and prevent the ration from theft activity. Our overall system of smart ration card is shown in the fig 5 below

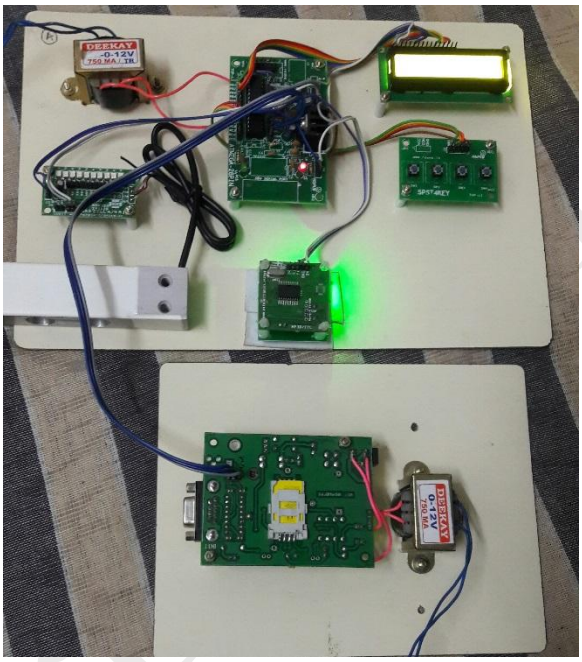


FIG 5 Overall Developed System

Initially the LCD displays, 'KG:0000' shows in fig 6

FIG 6 System Output for Smart Ration Card

The LCD displays, 'Please Show the Card'. Then the customer has to swipe his smart ration card (RFID tag) with the RFID reader, shows in fig 7

FIG 7 LCD Display

The fig 8 shows the RFID reader and RFID tag and how the RFID tag is swipe onto the RFID reader. When RFID tag comes in contact with the reader, then the database is processed for authentication

FIG 8 Swapping of ration card

Weight Scale is loaded with some kilograms. The kilograms display in the LCD to the customer shows in fig 10

FIG 9 Weight scale

Fig 10 shows the LCD displaying the kilograms of items available in the ration store.

FIG 10 Displaying kilograms of item

If the card found authentic then the LCD displays the name of the card holder shows in fig 11

FIG 11 Displaying customer name and monthly quota of customer

Once the material has been taken by the customer, then the GSM send the SMS about the delivered ration to the card holder's registered number as shown in fig 12

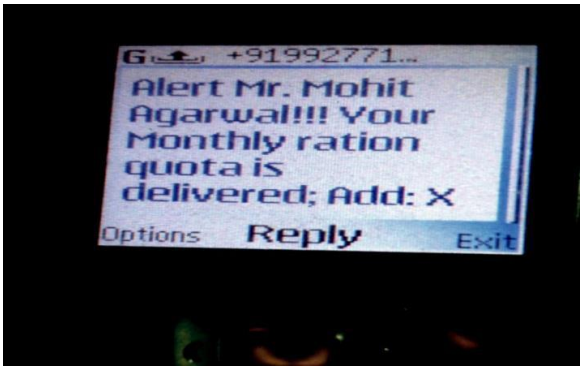


FIG 12 Message received by customer after delivery of ration

CONCLUTION

In this paper, we have implemented a smart ration card with the help of RFID and GSM technology. In the existing system, there is a drawback of ration forgery. The proposed system removes the forgery by showing the available items present in the store and removing the manual filling of the government record diary with the RFID and GSM system. The GSM system sends the information about the delivered ration to the government office and also to the registered number of the customer and the record will be maintained by the online system. However, this system is facing certain limitations like cost is high, it is a paid system because for sending the SMS charges must apply, no confirmation of the message delivery and the range of RFID is less. But we can remove these limitations by using active RFID, creation of online database for the system etc. but this will increase the costing of the system.

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