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A Step Towards Digital India Using Smart Ration Card

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Abstract— The traditional public distribution system, intended to provide subsidized food to poor households, is the largest welfare programmed in India**.** But this existing system has number of drawbacks that lead to corruption due to fake allocation of ration in order to get profit into their pocket, distribution of poor quality of ration items and also selling of ration items at high rates to other people. We have introduced a new concept in this paper that involves the use of Radio Frequency Identification Technique (RFID) and Global System for Mobile Communication (GSM) technology in Ration Distribution System. The main objective of the proposed system is the automation of ration shop to provide transparency. The unique RFID tags are provided to every consumer instead of traditional ration cards. Consumer's database is stored in microcontroller which is provided by Government Authority. Consumer needs to scan tag to RFID reader, and then microcontroller checks consumer's details with stored to distribute material in ration shop. After successful verification, ration is allocated to the consumer according to the quota displayed on the display device. After delivering proper material to consumer, the microcontroller sends the message to customer as well as PDS authorities using Global System for Mobile (GSM) technology.

Keywords— RFID Reader, RFID tag, Display device, GSM Module

I. INTRODUCTION

As we all know that Ration card is an important document for every citizen in India, as it is being used as a proof for address and also required while we apply for visa, driving license etc. This ration card is being allocated by the Government authorities involves consumer information such as address, family members details etc. The Proposed System of Smart Ration card uses RFID and GSM technique. State Government issues distinctive ration cards like yellow ration card, saffron ration card, and white ration card depending on family annual income. The distinctive ration card has various quantities to be distributed to the consumer as allocated ration quota. So to avoid this , we move to Smart Ration Card using RFID & GSM technique every customer has to give a RID tag which acts as a ration card and it is unique. The RFID tag creates a circular magnetic field around itself that is scanned and detected by the RFID reader and then it displays the information on the display device. The display device then displays the allocated ration quota in terms of kg to be distributed to the consumer by the dealer. The GSM technique is used to send an SMS to the consumers registered number in order to acknowledge the consumer regarding the allocation of ration. This creates transparency between the public distribution system.

II. EXISTING SYSTEM

The existing system is the Public Distribution System that is based on the manual entry and the ration is allocated to the consumer. But this system has number of drawbacks that the quantity of ration that is being allocated may differ from the actual allocated ration. The dealer may make fake allocation of ration and sell the ration at higher rates than the rates given by the government, this lead to corruption in the system. The consumers are not aware of the actual allocation of ration quota and the rates imposed to the ration items. Transparency lacks in the system and this leads to corruption.

III. PROPOSED SYSTEM

The system involves Smart Ration Card using RFID and GSM Technique.

A] Block Diagram

The Block diagram of Smart Ration Card as shown in fig [1]. In this system we use the microcontroller, RFID tag, Power supply, Display device and GSM module.

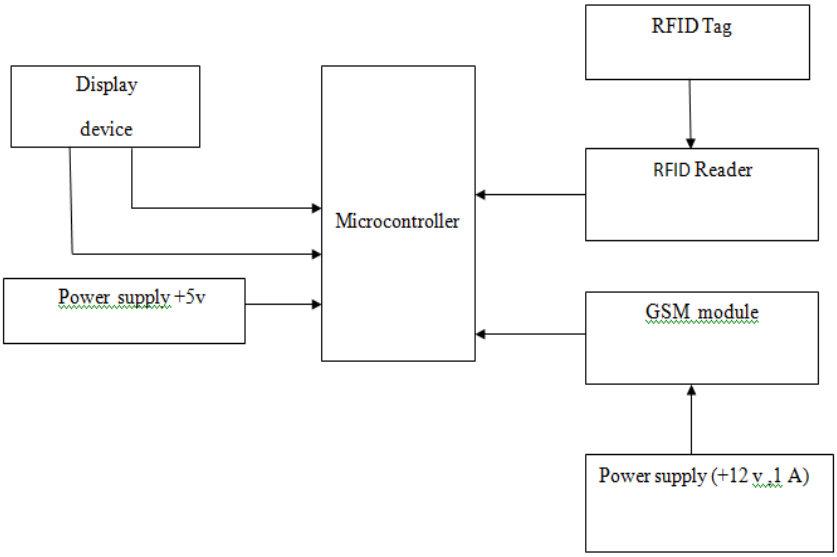


Fig (1): BLOCK DIAGRAM OF SMART RATION CARD SYSTEM.

In this System the RFID reader is used to swipe the RFID tag and it generates a unique 12 digit hex code which is unique to each and every consumer the input pin of RFID reader is attached with the transmitting/receiving pin of Microcontroller and also the transmitting pin of microcontroller attached with the receiving pin of GSM module, The GSM module works with the +12V,1A power supply .The microcontroller work with +5V power supply, the display device attached with microcontroller which is used for display the allocated ration quota.

B] SYSTEM ARCHITECTURE

Fig[2] below shows the actual architecture of system, the RFID Reader swipe the RFID tag it will generate the 12 digit Hex code and this code is send by reader to microcontroller, the microcontroller match the 12 digit code with database , if the information is valid then information is retrieved by database. The retrieved information is displayed by display device with consumer name and monthly allocated quota. After delivery of ration the microcontroller instruct GSM module to send SMS to the registered mobile number of consumer and inform consumer to deliver the ration. Consumer can also provide their feedback and complaints if any.

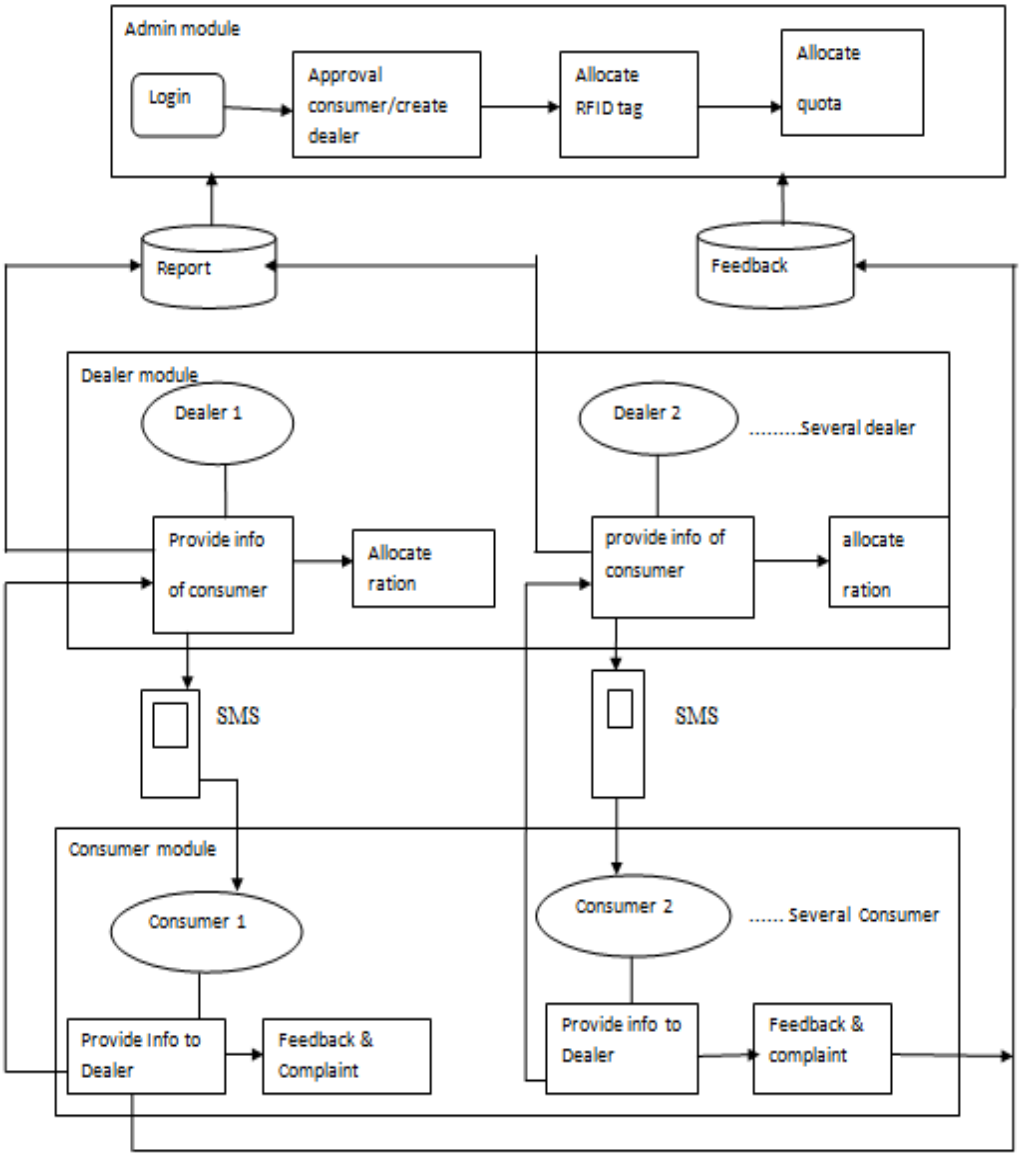


Fig (2): Architecture of the Smart Ration Card System.

The Smart Ration Card works in four steps as follows:

1. Input Part

In this system each customer have RFID tag which is nothing but customers Smart Ration Card. RFID develops a unique magnetic field , when this field comes in range of reader, the reader generate 12 bit hex code. This code is unique for each customer .As soon as reader reads the ration card it directly transmits the data to microcontroller.

Fig (3): RFID Tag being scanned by the RFID Reader

2. Processing Part

Microcontroller comes under the processing part. Scanning of RFID tag provide data to the microcontroller, processes the data and match the with the database which is authenticated by Government. If the Ration card is authentic then process goes further otherwise shows an error that the invalid card.

3. Display part

If the microcontroller finds the card authentic then the system process for display the name of the card holder and the monthly allocated ration with type of ration and quantity in term of kilograms.

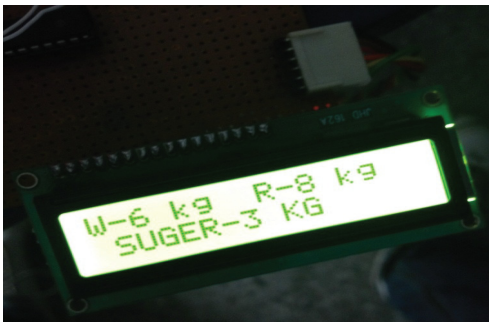


Fig (4): Display device displaying the monthly allocated ration quota of the consumer.

4. Messaging Part

Messaging system is proposed here to avoid the forgery done with the ration card, which helps the customer to take an action towards ration forgery. This System sends message of information of delivery of ration to the registered number of consumer.

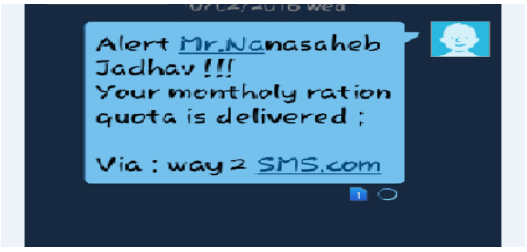
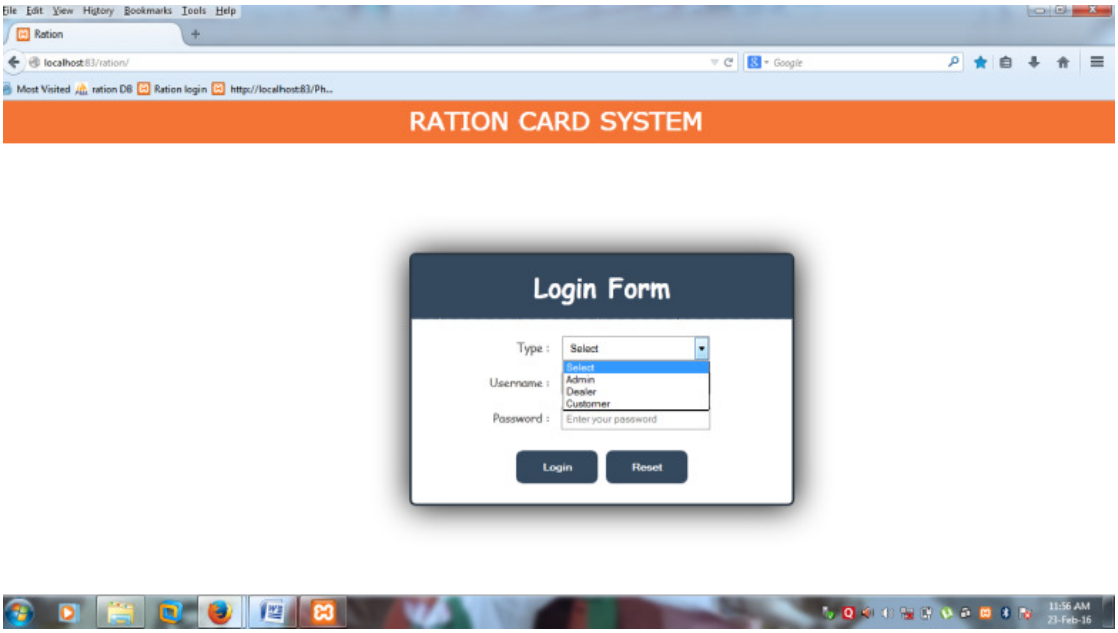


Fig (5): SMS received by the consumer after receiving ration, sent using GSM Technology.

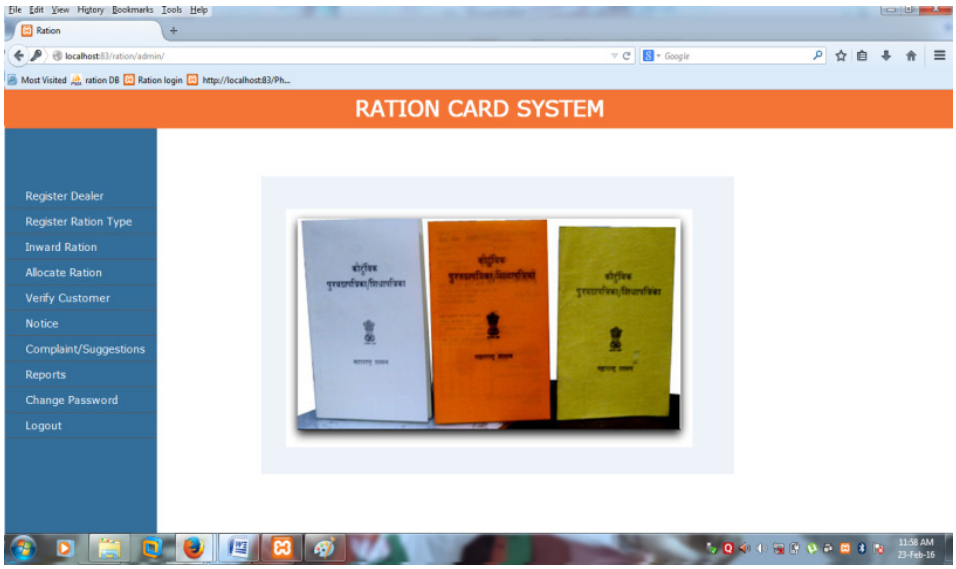
IV. EXPERIMENTAL RESULT

Figures show the results of the implemented system for Smart ration Card System for the login into the system that allows us to select the Admin, Dealer or Consumer. The access rights for different loggers is different allowing users to carry out the tasks in the system



FIG(6): LOGIN PAGE FOR SMART RATION CARD SYSTEM.

Admin of the implemented system that is the Government Authorities in our system has different access permissions that allows him to carry out different task. The home shows different options for Register Dealer, Register Ration Type, Inward Ration, Outward Ration, Verify Customer, Notice etc.



FIG(6): HOME PAGE FOR SMART RATION CARD SYSTEM

V. CONCLUSION

We have presented new Smart Ration Card System and web portal which reduce efforts of the dealer to allocate ration to each and every family consumer area in Allocated area. Also our system reduces corruption through dealer to great extent. Each consumer can complaint if any regarding dealer or give their valuable feedback to the Admin of the System. Our Smart Ration Card System which is being operated by Government itself acting as an admin to the system gives instructions to the dealer regarding ration allocation online so that there will be transparency maintained between admin and consumer. This System can be implemented as a replacement for current manual Ration card system in India, so that will improve the ration transaction to a great extent.

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