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AUTOMATIC RATION MATERIALS DISTRIBUTION BASED ON GSM AND RFID TECHNOLOGY

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ABSTRACT

Public distribution system distribution is one of the widely controversial issue that involves corruption and illegal trafficking of goods. One reason of this to happen is because every job in the ration shop involves physical labour and there is no definite technology involved in automating the job. Involvement of manual work calls a lots of unconformity. These unconformity or illegal activities are for example - wrong entries in stock directory of shop, wrong stock information of the products. To conquer this we proposed an automatic ration material distribution based on RFID and GSM.

Index Terms: GSM, Microcontroller, SMART CARD, RFID

I. INTRODUCTION

The ration distribution system is one of the biggest government's economic policies in India. Its main goal is to providecereals (sugar, wheat, rice, kerosene etc.) to the people at cheaper rates. The network of the ration shops is spread all over India.to provide ration to the needy in subsidised rates. This distribution of ration is regulated and monitored by central government, along with the state government,but it has numerous drawbacks firstly the worker involved in the ration center are corrupted they keep the fake ration card with them and get the product in the account of other people so the beneficiary are not getting the product and the dealer sells the product in the open market. The dealer may not provide a sufficient amount of food grains to consumers. Most of the time consumers are not aware of the availability of material in ration shop. The dealer may sale ration at higher rates that approved by the government or he may do wrong entries in the stock directory. In this way, in the current situation we are facing problem of corruption and irregularities in public distribution system. There is no such effectual system through which government gets acknowledgement of purchased item of food grains by people.

II. LITERATURE SURVEY

The implementation of the "Automatic Rationing System Using Embedded System Technology" is done by S.Sukhumar et.al.[1] and he proposed concept to replace the physical work in public distribution system. The ration distribution system is automated by using PLC, which is similar to the operation in ATM. This

automated ration system replaces the conventional ration card system by using the smart card. In addition to that the finger print sensor is also being placed in the machine in order to check the user authenticity. If the person is authenticated, the next process takes place and the input can be given in the LCD screen. As soon as the input is entered, the products are obtained from the automated ration center and the amount is withdrawn from the account of the purchaser. The embedded controller ispreprogramed in such a way that they perform that operations.

Dhanojmohan,Rathikarani,Gopukumar[2],"Automation in ration shop using PLC'', proposed a procedure for ration shop automation using embedded PLC. Further the transaction details of the consumer is updated to the government database and also the stock availability and the customer details were monitored by government.

The concept of etectronic ration vending shop has been given by mohammadshafi[3] to focus mainly on the plan which is adopted for using ICT in order to control wastage and leakage in the delivery mechanism of product and its successful application in online monitoring and maintaining an online record of food grain supply chain.

Kashinathwakade, Pankaj chidrawar and dineshaitwade [4] has designed the conventional ration shop into the "proficient ration dispension and controlling". Here the customer has to use the RF based ID card to collect ration from the ration dealer. With the help of PDS device the ration shop worker will collect amount easily after selection of amount and quantities. In last GSM is used to send the bill details and quantity details to the consumer.

The concept of NFC card based ration material monitoring and billing system with auto informing facility was given by M.elizabethsherine and shinusadeyone [5]. This process is used to keep the details of the stock present in ration shop automatically and also it intimates the customers if any new stock arrives and the NFC tag is used to communicate with the consumer and give the materials automatically. Subsequently GSM sends message to customers.

Recently Vikramet. al. [6] has proposed Smart Ration Card System. The RFID tag is modified as smart ration card by dumping the code into Microprocessor chip present in the system as per requirement. The smart card carries its specific information about the buyer. When the consumer visits the ration shop, he has to show the ration card in front of RFID bar code reader. Dealer certify the smart card & accordingly delivers ration.

Sharmaet.al.[7] has proposed new ration dispensionsystem using biometrics, facial recognition and voice recognition system to monitor the stock in ration shop . In automatic ration distribution system the setup is to be placed in every ration shop. In present condition more than 0.5 million ration shops exists in India. So it is very expensive to have an automated PDS thereby it is hectic and tedious job for illiterate people operating such complex system. Therefore it is suggested by him to online monitor the ration system via internet.

III. CONVENTIONAL DISTRIBUTION SYSTEM

Ration Distribution is the main area where the corruption and illegal trafficking of good takes place. This is because every job in the ration shop involves physical work and there is no specific technology to automate the job. The main concerns is the illegal or wrong entry in directory of the shop about the amount of products given to the consumers. The second affair is the weight of the products that are given to the people. In the existing

method first the customer needs to go to the ration shop then show the card to the employee there. After verification of card the customer needs to ask the material from them and after that they gave the material manually which is incorrect in weight as well as quality and after that the transaction detail needs to be added in the Ration card which involves lot of irregularity and fallacies.

There are many ration shops in the entire nation where the employees are appointed to distribute the various commodities like food grains, oil, kerosene etc. manually .The buyer has to go to the ration shop and ask the shop employee to give the ration material and the amount of product he needs. The employee then manually measure out and gives it to the customer. The transaction details also needs to be added in to the ration card. This is a total mutual process which takes place. This system faces different problems. As there are various ration shops and the customers coming to purchase materials from ration shops are normally believed to bepoor, illiterate and under below poverty line, so they become easy pray to the dealer and customers are therefore cheated to a large extent. There are complaints mainly related to the quality of the product that they receive, the quantity they receives is several times less than the quantity demanded by them. Moreover, they end up paying more amount for the quantity they receive. Also the quantity and amount which is added in the ration card is wrong. So they cannot buy more thing which they require next time. So there is a lot of cheating and fooling of the customers that takes place. The other problems are mentioned below

- Materials theft
- Mixing of products
- Poor quality of supplies
- More than the prescribed rates are charged
- Cannot able to get the accurate quantity of supplies

IV. PROPOSED METHODOLOGY

Automating the existing system is our most important aspect to overcome various existing problems. The various things that we can do to automate the rationing system are explained below. The quantity and the type of required materials should be given by the customer to into the application running on the system at the outlet of ration system by the customer itself. After entering the weight the solenoid valve will open and the customer need to keep the bag close to the valve to get the material. After getting the material the gsm board send the message to the customer as well as to the higher official. Thus the main fallacies involved in the fooling of purchaser where they receive leser quantity than what they have asked for and end up paying more. In this way the problem like wrong entry in stock register, incorrect weight, making false or double entry etc. are all dealt with in this implementation of the system.

A. Elements of Automatic Ration Distribution System

The Entire Automatic Ration Distribution System can be divided basically into three parts. They are,

1. RFID Module
2. Microcontroller Unit
3. GSM Module

1. The smart card i.e. the RFID Tag is integrated with microcontroller (16F877A). The RFID Based smartcard reader is connected to microcontroller via RS232.This RFID Tag behave as Ration card and it stores the information about the user.

2. Microcontroller system: This is the heart of the system. It is mainly used to interface all the component. It can be used to dump the coding into it and which makes the kit portable.

3. GSM module interfaced with microcontroller: Here the GSM module is being used to transfer the information of purchased item, amount, and the quantity in the form of SMS between microcontroller assembly and to higher official. This transfer of information is required for user authorisation and for other details.

B. Algorithm

Algorithm for the proposed system has eight steps as follows.

Step 1: Each and Every consumer should be provided with a RFID based ration card which is certified by the government.

Step 2: When ration distribution starts, first the customer needs to show the RFID card and enter the password.

Step 3: If the passport matches then the system starts.

Step 4: Once the verification is successful, consumer is asked to select type of material and quantity required through and keypad.

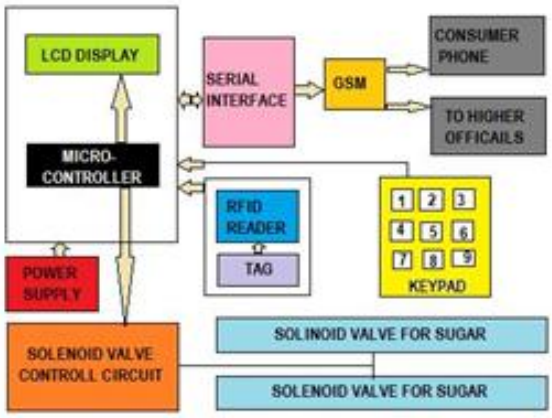
Step 5: Based on kind of material chosen, the motor or solenoid valve is start to dispense material.

Step 6: The weight sensor used to check for proper quantity.

Step 7: After collecting the exact quantityof material motor or solenoid valve is disabled.

Step 8: GSM module will send the information of transaction in form of SMS to the user as well as PDS authority.

C. Block Diagram of the Proposed System



PIC MICROCONTROLLER 16F877A

This is the heart of the system.The 40 pins make it easier to use the peripherals as the functions are spread out over the pins. This makes it simpler to decide which external devices to attach without any trouble because

there are enough pins to do the job. One of the main benefit is that each pin is only shared between two or three functions so it's simpler to decide what the pin function (other devices have up to 5 functions for a pin).Therefore it is mainly used to interface all the component which is used in the project.

RFID

RFID stands for Radio-Frequency Identification. This RFID Tag acts as a Ration card. Where an RFID TAG stores the information or a data about a person in detail and with the help of an RFID reader the data is captured from the tag and then the information is passed to the pic controller.

GSM

GSM stands for global system for mobile The GSM system is used to communicate the information of purchased item to the customer and to the higher official in order to monitor the corruption that is happening in public distribution system.

LCD

Liquid Crystal Display is the technology used to display various information to the user. In this system LCD is used to convey message with user. It shows the message and according to that the customer responds to the system.

POWER SUPPLY

A power supply is an electronic device that feed electric energy to the electrical device. The main function of a power supply is to switch one form of electrical energy to another and, as a result this is used to supply power to the ration distribution kit.

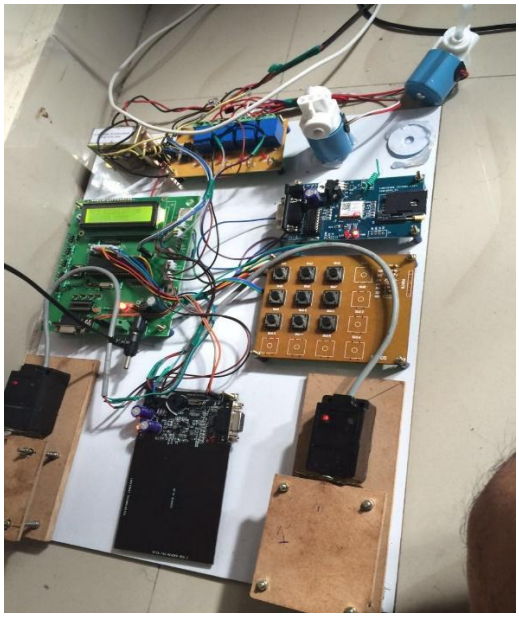
KEYPAD

The keypad is used to enter the detail to the public distribution device. It is used to enter the quantity of material needed and to give input to the system.

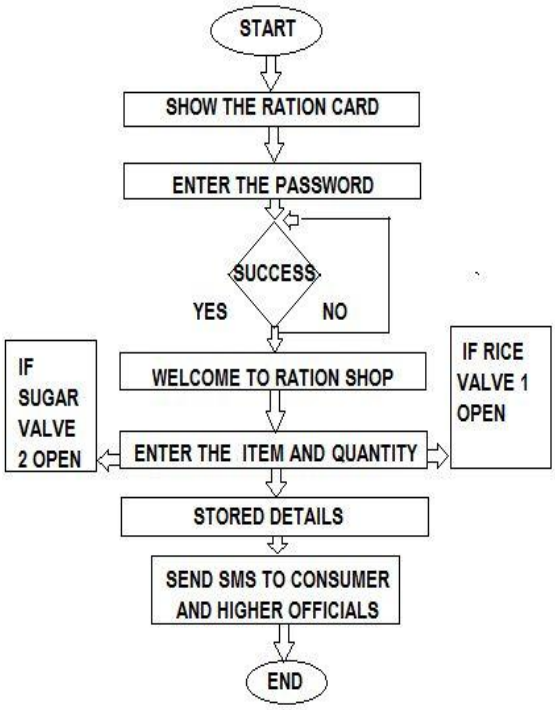
SOLENOID VALVE

A solenoid valve is an electrically operated valve. The valve is controlled by an electric current through a solenoid. It has two opening one for input and other for the output. When the quantity is entered the valve opens and after delivering the desired item the valve closes automatically.

D. Prototype Model



E. Process Flowchart



F. Working Process

First and foremost Govt. should replace existing ration cards with e-ration card (RFID tag) provided, it must be issued to the respective ration card holder. When the pensionary will approach the ration distribution centre, he has to show an e-ration card in front of RFID reader Kit, the reader that is integrated with the project kit will recognize the RFID numbers show by the user. Each user will have a specific number. This recognized RFID number will be given to a microcontroller, for this initially code is written in MP lab for pic controller. It is

nothing but pic source code. This source code is compiled using compiler named MpLab.Before compiling object files corresponds to each 'C' file get created. These object files must be deleted. As an output .Hex file get created and the code is damped in pic controller after that device is switched on and it flashes the message on the LCD"please display your ration card" and if the card is recognised it will ask for the password. If device password is incorrect, it demands it again and if it is correct, then it convey the message welcome to ration shop after some time it shows the available item in shop. After choosing the desired item it demands the quantitywhich is to delivered. After entering the quantity the solenoid valve opens and vends the material. The weight entered is compared with the value of weight sensor and after getting the exact weight the solenoid valve is closed and simultaneously a message will be sent to the consumer about the transaction detail of purchased items.

The proposed system brings transparency in public distribution system as the work becomes automatic. In this system, different ration materials like (sugar, rice,oil, kerosene, etc.) distributed through automatic mechanism without any intervention of humans. With the help of this system, it is possible to make public distribution system effective and free from malpractices. After receiving the materials, controller sends the information to the higher official andthe customer through GSM technology. The proposed system is helpful to prevent malpractices going at ration shop, maintain data properly, reduces paper work, time saving approach and cost effective.

▪Corruption in the Government and market sector can be stopped if this system becomes automated.

▪Increased adulteration in consumables can be prevented.

▪Cost effective approach.

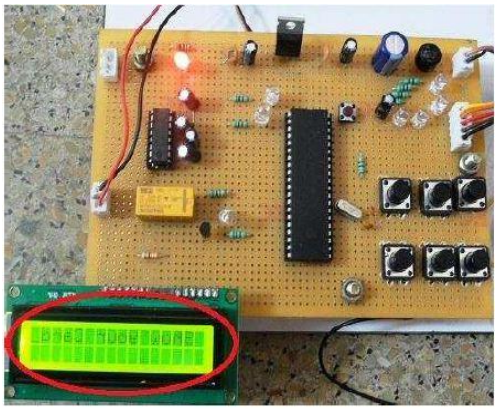
▪Time saving approach.

▪This system helps to keep the data properly.

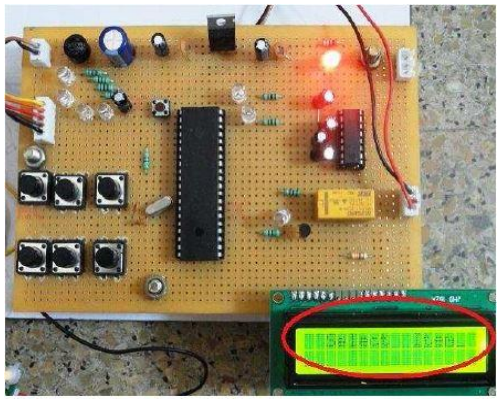
V. RESULTS AND OUTPUTS

The Automatic Ration Materials Distribution Based on GSM and RFID Technology used to dispense or vend the liquid or solid material. First of all everyone will be provided an RFID or smart Card, rather than a ration card. If the customer needs to get any commodity, the user has to show the ration RFID tag card to the RFID reader Kit, the reader that is integrated with the project Then the customer need to enter the quantity and the type of material and the material will be automatically vended from the system and simultaneously a message will be delivered to both the consumer and the higher official who is the in charge of Ration Distribution System.

The different steps involved in public distribution system are shown below:



Show your ration card



Item selection from system

Gram selection Message sent to customer

VI. CONCLUSION

In this paper, we have implemented and tested an Automatic Ration Materials Distribution Based on GSM and RFID technology in place of ration cards. But in the existing system having two draw backs, first one is weight of the material may be inexact due to human error and secondly, if not buy the materials at end of the month, they will sale to others without any hint to the government and customers. The above drawbacks rectified by

this method. Using this proposed system we can improve the working of the ration distribution system. Govt. can have indirect check on the availability of the ration to the pensionary. It is transparent and has control over prices of some commodities in the open market. Dealer will not be able to keep duplicate ration cards with them. System helps to modernize traditional rationing system and fight corruption up to a great extent.

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REFERENCES

[1] S.Sukhumar, K.Gopinathan, S.Kalpanadevi, P.Naveenkumar, N.SuthanthiraVanitha, "Automatic Rationing System Using Embedded System Technology", International Journal Of Innovative Research In Electrical, Electronics, Instrumentation And Control Engineering Vol. 1, Issue 8, November 2013

[2] Dhanojmohan,Rathikarani,Gopukumar, "Automation in ration shop using PLC," International Journal of Modern Engineering Research, vol.3,Issue 5,Sep-oct 2013, pp 2291-2977,ISSN:2249-6645.

[3] MahammadShafi., K.Munidhanalakshmi, "e–Ration Shop : An Automation Tool for Fair Price Shop under the Public Distribution System in the State of Andhra Pradesh", International Journal of Computer Applications (0975 – 8887)

[4] KashinathWakade, Pankaj Chidrawar, Dinesh Aitwade, "Smart Ration Distribution and Controlling" International Journal of Scientific and Research Publications, ISSN 2250-3153, Volume 5, Issue 4, April 2015.

[5] M.elizabethSherine, ShinuSadeyone, "NFC based stock maintenance and billing system with auto alert to customers", International Journal of Research in Engineering and Technology, ISSN 2321-7308, Volume 3, Issue 6, June 2014.

[6] Vikram Singh et. al. "Smart ration card", Volume 4, No. 4, April 2013 Journal of Global Research in Computer Science.

[7] Sharma et. al. "Multi-Modality Biometric Assisted Smart card Based Ration Distribution System", volume 3 June 2014, International Journal of Application or Innovation in Engineering of Management.