

Automatic Ration Material Distribution System Using RFID and GSM

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Abstract— People having a ration card use it to buy the various materials (sugar, rice, oil, kerosene, etc) from the ration shops. But this system has two drawbacks, first one is the weight of the material may be inaccurate due to human mistakes and secondly, if the materials are not bought by the end of the month, it is sold to others without any intimation to the government and customers. In this paper, an Automatic Ration Materials Distribution Based on GSM (Global System for Mobile) and RFID (Radio Frequency Identification) technology is proposed instead of ration cards. To get the materials in ration shops customer need to scan the RFID tag into the RFID reader, then controller check the customer codes and details of amount in the card. After verification, these systems show the amount details. Then the customer needs to enter the required materials by using keyboard, after receiving materials, controller sends the information to government office and customer through GSM technology. Our proposed system provides the materials automatically without help of humans.

Keywords: Arduino, RFID tag, GSM, Automatization

I. INTRODUCTION

Ration cards are basically meant for the purpose of distribution of rice, wheat and kerosene at subsidized rates through fair price shops. If a person wants to buy the supplies then he need to used ration card first then they sign on the ration card and accordingly material is being distributed and this material distribution is done with the help of weighing machine and human. But in this circumstance there are two drawbacks, first is inaccuracy in weight of materials because of human interaction and second is that if the person will not secure the material till end of the month then the distributor sells it to anyone without giving any information to the client and government. In this paper, we have projected an Automatic Ration Materials Distribution Based on GSM and RFID Technology to circumvent the problems. Now days we are having a lots of problem related to transport for the ration. This problem can be overcome by using RFID Technology. RFID card can be used in various things such as ATM card and other purpose. Here GSM is used to convey the information regarding material and this make system faster.

II. RFID

The many benefits of RFID technology make it possible to build a solid business case for its use in different industries and for different applications.

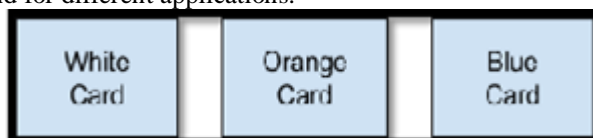


Fig. 1: RFID Card

RFID is used across construction, engineering, the chemical industries, manufacturing, retail, logistics, and the public sector as well as many others. However, the value of

the various benefits of RFID is often different in different sectors.

Here are some of the benefits of RFID:

A. Lower Cost & Higher Productivity:

RFID applications can automate the collection of information about the movement and location of assets, components, stock or other items; doing this more quickly, whilst reducing costs and with greater accuracy and reliability than is possible with manual methods and with more detail than can be obtained from techniques such as bar-coding. Data collection can be a by-product of other activities, eliminating the need for effort in form filling. Identifying products using RFID is quicker than barcode scanning or manual entry of product details.

B. Improved Quality for Data Capture:

Using an RFID approach means data can be captured rapidly and accurately. Electronic data collection with RFID avoids data transcription errors and avoids “missed items” when used to collect data on large numbers of items at once.

C. Reduced Capital Costs:

RFID technologies help to lower costs by providing better control of stocks or assets. They can help keep track of business assets such as test equipment, transport packing, computing technology and other portable devices.

D. Better Security:

Access control systems using RFID contribute to improved security of business premises. RFID tagging of stock and assets makes it easier to track inventory “shrinkage” and tags can be used to fight against product counterfeiting.

E. Increased Revenues:

By reducing stock-outs, by avoiding the credibility gap between notional stock available for orders and actual stock present in the warehouse, and by offering improved information on product movements to customers, organisations using RFID can provide a service that creates competitive differentiation and promotes increased customer satisfaction with the opportunities for higher sales and better margins.

F. Shorter Processes:

Because RFID technologies can be integrated with other manufacturing or supply chain technologies (automated pallet handling, stock picking systems, etc) the time from order to despatch and delivery can be reduced.

G. Improved Regulatory Compliance:

Using RFID to control when devices have been inspected or to restrict their movement can form part of a strategy to address health and safety issues or to satisfy insurers or regulatory bodies that processes are being followed.

H. More Accurate and Relevant:

Because RFID allows data to be captured in real-time as stock or assets are moved, detailed, up-to-date, management information is available for planning and operational management purposes.

III. GSM (GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS):

Global System for Mobiles is the primary technology used globally for 3G mobile networks, with about a 73 percent market share. GSM competes primarily with Code Division Multiple Access technology, which is the technology used by five of the seven largest carriers in the United States. While GSM provides compatibility, multitasking and speed advantages over CDMA on a 3G network, most carriers around the world are switching to the Long Term Evolution standard for their 4G networks.



Fig. 2: GSM Module

A. Emergency Response:

112 is now a universal emergency number among GSM networks. No matter where the user is, if they're using GSM, they can call for help.

B. Technological Growth:

The growth of communications technology has been prompted by worldwide competition, allowed by the universality of GSM. This has led to a reliable cell-phone service and improved quality in both connection stability and ease.

C. Universal Data Transfer:

The Global System for Mobile Communications allows for reliable and efficient data transfer. It even allows text and pictures to be sent from anywhere the system is available.

D. Greater security:

Due to the way it's designed, a call needs to request access. This is a safety feature that makes sure that only the caller and the receiver are in the conversation.

E. Has international capabilities:

While sometimes costly, GSM phones have built-in international capabilities. Occasionally, it costs more depending on what region the call is being placed to, but it remains a valuable benefit.

So we have decided to make use of both these technologies in this project/paper which will make our system faster and robust.

IV. LITERATURE SURVEY

Programmed Ration Supplies Circulation Based uses GSM and RFID. To use the benefit of the government user has to scan code using the reader that will fetch details of the items which is allocated to the user, and the microcontroller of system checks user's details and quantity allot to user. The amount is shown after authentication. Then user should select the necessary materials using user interface. After receiving order, controller will send information to authorities and customer by using GSM technology. This system of smartcards is for all the citizens. We have made the system user-friendly so that any age group can easily understand and operate the system. The smartcard has all the details of the citizen. Citizen can view the total quantity of the stock available. After each and every purchase the stock gets updated in board and the citizen receives the alert message and an information email from government with the transaction time and number of products bought with the product unique id and the data is also uploaded in the main database immediately. The card is verified by the user's fingerprint. To check whether he is a real smartcard pouch, every person's limb print in a household are calm during card inviting and for that reason items are owed.

The existing predictable ration system has the basic issues of renewing the ration card every year by the employees to the malpractices done by the ration store dealers like diverting food grains to open market to make profit. To tackle this problem K. Balakarthik proposed the "Cloud-Based Ration Card System using RFID and GSM Technology" [1], presents an efficient method for the user to buy the products in the ration shop by just irregular the card at the RFID reader. The user authentication is done by sending a random password text to the user mobile which has to be entered in a keypad. The purchase is validated by the employee only after the details are entered in a windows application which stores the user's personal and purchase information. The current PDS involves corruption and illegal smuggling of goods because of manual work. A.N. Maduretal Developed the "Automation in Rationing System using Arm 7" [2], S. Valarmathy et.al. Proposed the "Automatic Ration Material Distributions Based on GSM and RFID" [3]. Here each customer is provided with RFID cards. In this system, first user is authenticated, and then system shows the balance of person. User has to enter the amount of Kg he wants to withdraw.

If the user will have sufficient balance to withdraw the current amount, system will open the valve. Through valve grain will come and it will get weighted by weight sensor. Once the count reached the entered amount controller automatically shut down the valve and updates the account of the customer. The updated account information is sent to the customer's mobile using GSM. Rationing distribution is one of the widely provocative issue that involves wrong entries in stock register of shop containing wrong stock information of the products that is supplied to the public, so Rajesh C. Pingle et.al. Suggested the "Automatic Rationing for Public Distribution System (PDS) using RFID and GSM Module to Prevent Irregularities" [4], in this automated system conventional ration card is replaced by smartcard in which all the details about users are provided including their AADHAR

number which is used for user authentication. To involve government in the process we proposed connecting the system at ration shop to a central database (provided by government.) via GSM and RS232. Hence it is possible to prevent the corruption and irregularities at ration shop. The existing PDS system causes congestion at ration shop due to manual work so S. Sukhumar et.al. Proposed the “Automatic Rationing System Using Embedded System Technology” [5], in this the ration distribution system is automated by using PLC. This automated ration system replaces the conventional ration card system by smart card. The proposed ration shop system is connected to the government database via GSM modules, which further sends the up-to-date information to the government and the consumer. So we suggested the “e-Ration Shop: An Automation Tool for Fair Price Shop under the Public Distribution System”.

V. EXISTING SYSTEM

India’s Public Distribution System (PDS) is the largest distribution network in the world. The responsibility of distributing food grains lies with the government. The major groceries distributed are rice, wheat, kerosene....etc. The main objective of Public distribution system is to provide groceries at low prices to the vulnerable sections of the society and to influence the price of groceries in open market. Public Distribution System (PDS) faces the challenges like quality of food grains and inaccurate identification of ration card holders. In the existing system one ration card per family is issued by the state government for people under poverty line. In the ration shop, first we need to submit the ration card and then it is authenticated. Then they will issue the quantity of groceries eligible through weighting system manually. Then they will record the details. This method is inaccurate, tedious and may sometimes result to malpractices.

VI. THE PROPOSED SYSTEM

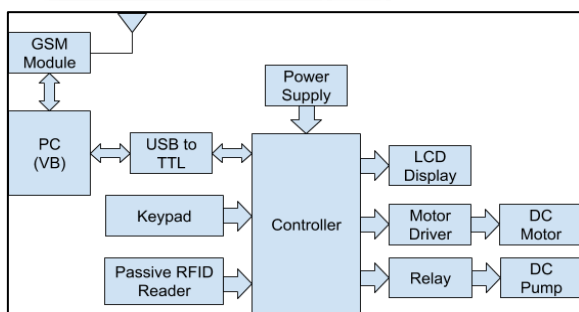


Fig. 3: Workflow Of The Proposed System

In this project, an automatic Rationing System is used to distribute ration to customers. It proposes automatization of distribution technique at the ration shop with maintaining even the database at one main control station and updating the database for the shopkeeper so that it is clear with people. The tags are used as an authentication of valid users. For updating purpose, GSM technology is being used.

RFID tag replaces the ration cards in this project. We are storing the name and phone number of the customer in the rfid tag. Due to low memory of microcontroller details of only three customers are stored. When the tag is read by the rfid reader name and phone number of the person is displayed on the LCD screen. Then the required product and quantity

has to be given through keypad. Immediately a message is sent to the customer through GSM.

We can store all the details of the customer like aadhar number, annual income, family details etc in the tags. Because of the memory constraint of microcontroller, we are having only three ration card holders. This memory constraint can be eliminated by using servers having large memory to store customer’s information. When there is shortage of groceries at ration shop immediately information can be sent to authorities by short message service. We can also create a website to display the details of customers and the groceries they took.

The Electronic Distribution of Goods in Ration Shop depends on GSM and RFID Technology which is utilized for Ration materials dispersion in proportion shops. At first everybody will be given a RFID Card, rather than a proportion card. In the event that the client needs to get any apportion material, the client needs to demonstrate the proportion RFID label card to the RFID per user, the per user will perceive the RFID numbers appear by the client. Every client will have a novel number, which is not noticeable to the client. This perceived RFID number will be given to a microcontroller, which contrasted the info number and the database. Before beginning the framework, the exceptional RFID number of the apportion client will be customized in the controller, for example, User name and secret key, so that the controller will perceive the information originating from RFID by contrasting and the database. Once the client is distinguished, the apportion things to be administered will be shown on the LCD screen, the client needs to bolster the remarks, for example, the weight he will purchase. As the apportioning procedure is going on all the while the controller will send a charge to GSM Modem, to send the content SMS to the client about the proportion thing, he or she obtained.

We are using a local server for database of user and ingredient of ration. Controller is used to operate the ration distribution mechanism. Keypad is used to select the input of which material is selected. LCD display will show option of material. GSM Module is used to send SMS of payment to the user.

VII. CONCLUSION & FUTURE SCOPE

A. Conclusion:

The proportion card is supplanted by brilliant rfid card and client is verified to stay away from phony and great robbery .This proposed venture would make straightforwardness in the framework by making an impression on the client.

B. Future Scope:

In future we can enhance the memory and can store the information of all clients. On the off chance that some goods are not upto the need, data can be sent to both government experts and the card holders utilizing gsm innovation. We can confirm the rfid cards with passwords. We can enhance the consumer loyalty by enhancing the security.

The proposed system has an advantages like it helps to prevent malpractices at ration shop, maintain the proper data, reduce the paperwork, it saves the time approach and cost effective.

This application which can be used in ration shops has a lot of scope in various other areas apart from being introduced only to this particular system. This particular system can be used for a huge number of items which can be selected from one controller by its own. As there is various number of access, it can remove the worthless time for various types of applications. So the users have 24x7 availability of active services. This can be the profitable to some organizations and they may opt for installing such a system.

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