



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 7, Issue 2, February 2019

## Automated Ration Distribution Vending System

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**ABSTRACT:** This paper proposes automation in ration distribution system using smart card technology. The existing ration card system has numerous problems. These problems ranges from the basic issues of renewing the ration card every year by pasting excess sheets which has to be done manually by the employees to the malpractices done by FPS dealers like diverting food grains to open market to make profits. There is another problem of irregularity in opening shops and false announcements of insufficiency in food grains. By using this system the major problems like bribery, irregular distribution and other difficulties faced by the poor people are eliminated. Illegal activities in the PDS (Public Distribution System) can be greatly reduced by this method. The distribution process is automated using centralized server and so the government facilities reach people properly. The corruption and bribery is the major problem in PDS which can be avoided using this system. The computerized database maintained avoids wrong product entry by the officials and provides authenticated transportation and distribution. Using this technology we can achieve secure approach for automization in ration system. Customer detail are stored in the database provided by the Government. In this system, smart card (QR code based) which contains an unique aadhar number of all the family members, date of birth, address, card holder type (APL-Above Poverty Line, BPL-Below Poverty Line, AAY-Antyodana Anna Yojana ) which used for biometric scanning. SMS will be send to both the Government authorities for intimating the stock details and to the customer intimating the stock availability.

**KEYWORDS:** QR code , Biometric scanner, LCD display, SMS alert.

### I. INTRODUCTION

Ration Distribution System means distribution of essential products to a large number of people. It is done by the Government. Public distribution system is one of the widely problematic system that involves corruption and illegal smuggling of goods. India's Public Distribution System (PDS) with network of 5,05,879 Fair Price Shops (FPS) is perhaps the largest retail system of its type in the world. 29.8% of India's 1.21 billion people live below the poverty line with monthly supply of subsidized food grains. The system provides gainful employment for Fair Price Shops Owners, their employees and hired labour who work at the FCI and state warehousing go downs. One of the main problems with this system is the inefficiency in the distribution of products. The Planning Commission say on the PDS system in its 2005 report. many systemic challenges that plague the PDS system today is "For every Rs.4 spent on the PDS, only Rs.1 reaches the poor" . "that means total 57% of the PDS food grain will does not reach the poor people ". many challenges that plague the PDS system are PDS Leakages, Scale and Issue of quality, Transparency and Accountability, Grievance Redressed Mechanisms. Keeping in mind the above mentioned factors, it is necessary to strengthen the PDS to ensure Adequate supplies, reasonable subsidies and efficient delivery of subsidized food to the deserving people of India All these happen because every job in the ration shop involves manual work and there are no specific high-tech technologies to automate the job. Our main objective here is to make automation of the process of the distribution. The previously existing method involves customer to tell the person handling the ration shop outlet, the amount of the commodity he/she needs and the type too. The person working ie) authority then measures the commodity and gives it



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to the customer. In our system, we will develop an embedded project where we will have the customer to input the amount he requires and the system made will automatically collect that much amount in a container. It is a new technique which takes into account the various social, economic and general aspects relating to technical as well as day to day disciplines. In the work presented here, a technique has been developed to read all the information from a centralized server automatically using the internet for computers. In the proposed system, every family will have a separate smart card. These cards are QR code based and they will contain beneficiary's information. Whenever a beneficiary gets the commodities from PDS all the transactions are recorded in the server. The system not only reduces the labour cost but also increases the accuracy and save some amount of time.

## II. RELATED WORK

Jinali Goradiaa, Sarthak Doshi, "Automated Ration Distribution System", International Conference on Advanced Computing Technologies and Applications, 2015. In this paper the hardware part of the project is explained and the machine will automatically collect the money from the card holder [9]. This paper indulges the system to make use of the man power to do the distribution work and this system does not provide any automation feature in it [10]. Pranjali Pedwal, Ms. Shubhangi Borkar, "Real Time Automatic Ration Material Distribution System", International Journal of Computer Science and Mobile Computing, March- 2016. This paper uses only RFID (Radio Frequency Identification) in its system but the ration card we are using now does not have any RFID tag it is made of QR code based. As we are currently using QR code based card it finds to be a difficult process to convert the ration cards to be of RFID tag included card. This system links the bank account and its detail to the card so that money can be deducted from it when the product has been purchased [11]. This paper the authenticity part which is by using the biometric sensor the authorization of the person getting the product can be known and the product can be distributed to the particular person has been included and the product distribution at all has not been described [12]. Gaikwad Priya B, Sangita Nikumbh, "E – Public distribution system using SMART card and GSM technology", International Conference on Intelligent Sustainable Systems, 2017. This paper includes a new method in which in order to provide authorization it includes a new technique of using SMS alert to the card holder by providing an OTP (One Time Password) so that the customer can enter that OTP in the system to get accessed to it. There will be no technologies to describe about the distribution of the product [13]. Chaitali Chandankhede, Debajyoti Mukhopadhyay, "A Proposed Architecture for Automating Public Distribution System", International Conference on Computing, Communication and Automation, in 2017. In this paper the existing system which has been used now a days in the ration shops are been discussed. In this there will be no automation of the process (ie) for distribution all the works in the system are being done manually and the system does not concentrate on authentication so that this system lay to be an inappropriate system which seems to be insecure [14]. M. Aishwarya, A. K. Nayaka, S. Chandana B, N. Divyashree and S.S. Padmashree, "Automatic ration material dispensing system", International Conference on Trends in Electronics and Informatics, 2017. This paper uses RFID (Radio Frequency Identification) in its system but the ration card we are using now does not have any RFID tag in it, it is made of QR code based. As we are currently using QR code based card it finds to be a difficult process to convert the ration cards to be of RFID tag included card. After the scanning of the RFID tag has been done it sends a verification code to the customer's mobile number which can be used as a method to provide authorization [15]. Yogesh Kumar Sharma, Dr Manoj Kumar Research Scholar, Mewar, Shamli, "User authentication techniques for implementation of Smart Card Based Ration Distribution System", 2017. In this system an authorization software will be used which is mainly added to check the fingerprint verification and the main feature of the system is that only one member among the family can get accessed to the card and will be able to get the products [16]. Aswathy B, Jasna Basheer Vishnu R, Preethish Babu S, "Automated Ration Vending Machine", International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering, 2018. In this system a vending machine structure has been developed along with this the main defect is that there will be no detail about the authentication feature and alert system in case of low quality which will be intimated to the authorities.

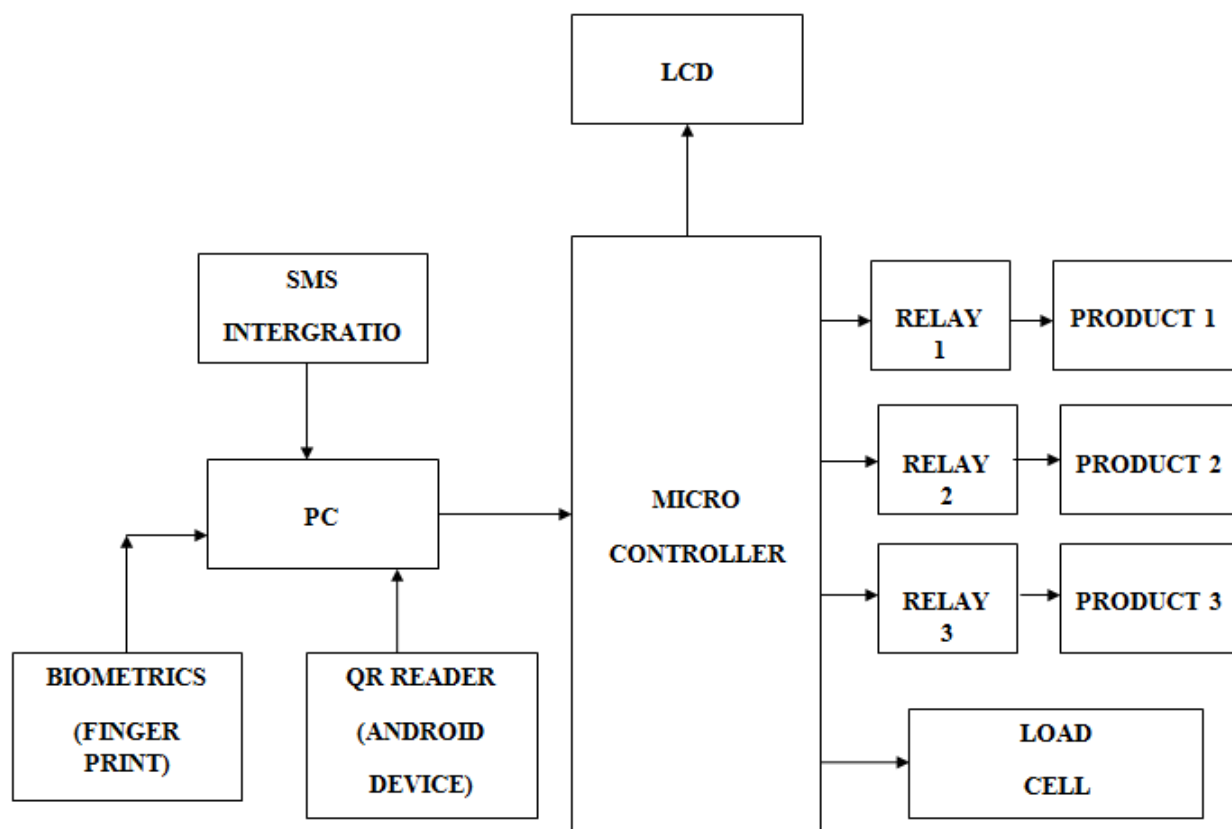
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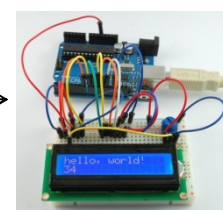
## III. ARCHITECTURAL DIAGRAM



## IV. METHODOLOGY

### 4.1 Input module

The input module consist of smart card with QR code which is commonly used in ration shops. The smart card contains details about card holder's name, age, DOB( date of birth),and the type of card i.e APL(above poverty line),BPL(below poverty line) or AAY (antyodana anna yojana) and the aadhar card is linked with each smart card for their fingerprints. Each family member in the card must link their aadhar card for the better experience of automation.The QR code is scanned with QR code reader using android device(mobile, tablet etc.) .After the scanning process of QR card the details of the customer will be displayed in the monitor screen.



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### 4.2 Scanning and Processing module

The QR code scanning being completed, then the biometric scanning process will take place. Here the fingerprint of the family member is get by the Finger Print Sensor (R305) -TTL UART is a finger print sensor module with TTL UART interface. The user can store the fingerprint data in the module and can configure it for identifying the person. The finger print module which can directly interface with 3v3 or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with Personal computer. The fingerprint scanning system has mainly two processing steps. Firstly, it enrolls the fingerprint, where it gets an image of the thumb, and finally performs matching, later it needs to determine whether the pattern of ridges and valleys in the image matches with the pattern of ridges and valleys in pre-scanned images. The scanning process starts when you place our finger on a glass plate, and a CCD camera takes a picture of our finger. The charge coupled device (CCD) system actually generates an inverted image of the finger, with darker areas showing more reflected light (the ridges of the finger) and lighter areas showing less reflected light (the valleys between the ridges). If the processor finds that the image is crisp and properly exposed, it proceeds to comparing the captured fingerprint with fingerprints stored in database. After verifying the valid customers, the system will provide access to their ration account.



### 4.3 UART module

The verification of fingerprint the customer will choose the product what they needed by using the channel relay. A relay is an electrically operated device. It has a control system and (also called input circuit or input contactor) and controlled system (also called output circuit or output contractor). It is frequently used in automatic control circuit. Relays are switches which are operated both electrically and mechanically. Relays consist of an electromagnet and also one set of contacts. The switching process is carried out with the help of the electromagnet. The operation of a relay comes in places where only a low-power signal can be used to control a circuit. It is used in places where only one signal can be used to control a lot of circuits. They are used to switch the signal from one source to another destination. The high end applications that is being used in relays require high power to be driven by electric motors. Such relays are known as contactors. A relay is an electromechanical switch which is being activated by an electric current. A four relay board arrangement contains driver circuit, power supply circuit and isolation circuit. A relay is assembled with that circuit. The driver circuit contains transistors for switching operations. The transistor is used for switching the relay. An isolation circuit prevents reverse voltage from the relay which protects the controller and transistor from being damaged. The input pulse for switching the transistor is given from the microcontroller unit so that it can be directed. It is used for switching of four devices.





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## 4.4 Output module

In this system we will be using a motor to control the flow of the product which is being distributed from the system. Initially after the product selection the lever that is present in the bottom of the funnel shaped device will be opened and we will be having a load cell which is used to measure the weight of the products which is being selected and which will be distributed to the customer. After the correct weight as mentioned in the database has been indicated in the load cell which is present below the entire device on top of which the product delivery bag will be present, the lever which is being present in the device will be closed automatically thus stopping the flow of the product. The customer then collects the product which is being present in the bag that is present above the load cell.

## V. CONCLUSION

This paper presents the conversion of manual work of the PDS (Public Distribution System) to an automated process. In this system we will be using QR code card which is currently being used so there will be no need of changing the ration cards the existing cards can be used as it is. This reduces the crowd in the ration shops and the system is made to be available for 24 hours. A database has been developed which reduces forgery of products and stock maintenance is also done without any errors. This system provides an intimation to the customers about the product availability and to the authorities about the low stock in the machine.

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