



Review on Public Grain Distribution System Using IoT

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ABSTRACT

This Ration cards are one of the most vital documents that impoverished people, particularly those living below the poverty line, require in a developing country like India. All citizens who have a ration card are able to purchase various products (sugar, rice, oil, kerosene, and so on) from government- run ration shops. However, as we all know, people are finding it increasingly difficult to obtain goods and services that the government sends in the same quality and quantity. This approach has two drawbacks in the current situation. First, owing to human manual errors, the weight of the material may be inaccurate and improper; second, if we do not purchase the goods and materials, the weight of the material may be inaccurate and wrong.

Key words: E-Ration, Fraud, QR code, Commercialization, Smartphone, Web Application, Scanner, Reader, IOT Device, Image Processing, QR Code

INTRODUCTION

Fair Price Shops (FPS) was established under the Public Distribution System by the Indian government in order to assure a fair supply of food to all Indian inhabitants (PDS). Rice, wheat, sugar, kerosene, and other essential commodities are distributed to the impoverished sectors of the country based on their eligibility and at a price set by the Indian government. Beneficiary will benefit from this project, which is a web-based and Android-based applicationsystem (card holder). Actors in the rationing management system include FPS (Fair Price Shop) shopkeepers and PDS (Public Distribution System). The main goal is to create a system that benefits shopkeepers and beneficiaries, as well as the government. This approach simplifies the rationing process while requiring the least amount of money. The customer can quickly access all product information and make a purchase [3]. PDS implemented E-Ration with Biometric device to make the current system more efficient and improve it. The identity of the cardholder and their information can be easily obtained using this gadget. Because residents' fingerprints are already stored in the Aadhar Card database, a positive match can be guaranteed each time a customer visits the FPS. This application is available to shopkeepers, and it makes the work of both the recipient and the shopkeeper easier. PDS implemented E- Ration with Biometric device to make the current system more efficient and improve it. The identity of the cardholder and their information can be easily obtained using this gadget. Because residents' fingerprints are already stored in the Aadhar Card database, a positive match can be guaranteed each time a customer visits the FPS. This application is available to shopkeepers, and it makes the work of both the recipient and the shopkeeper easier.

A. Propose Work

The current Ration Allocation System is an offline one. Due to this, corruption is rampant. Dealers often falsify records for personal benefit. They also provide the ration items of the poor people at maximum rates which is not justified. There

is a lack of transparency between the dealer and consumer. Due to this problem of dealer the poor people do not get the items as stated on their ration card. Moreover, there is no complaint system through which the consumers' interests can be protected. Using the Smart Ration Card Automation System, we wish to do away with all these problems and create a system which would be fair and just for all.

B. Problem Statement

PDS is an Indian food security system. It is run jointly by the Indian government and state governments under the Ministry of Consumer Affairs, Food & Public Distribution. The conventional Public Distribution System (PDS) is used to distribute groceries to India's underprivileged that have a valid ration card. State governments oversee the validity and distribution of ration cards. According to the PDS's guidelines, a ration card holder should receive 35 kg of food grain [5]. However, issues exist about the distribution process' efficiency, as well as fraud and supply availability.

C. Scope

The project's goal is to use QR Code technology to create a more efficient and effective ration card system. In Step towards Digital India, our project actively participates. This project seeks to automate the distribution system at the ration shop, as well as maintain and update the database from a single central control station so that the shopkeeper does not defraud the poor.

EXISTING SYSTEM

In India, there are two types of rationing systems: traditional paper-based ration books and electronic point-of-sale machines.

A. Traditional Ration System

In India, each household is given a ration card booklet composed of coloured paper, the colour of which represents the family's economic status. The family's demographic information is on the Ration Card. Depending on its location, a household is assigned to a certain ration shop from which it can only purchase its ration allotment. The shopkeeper physically checks the consumer's authenticity, checks the records in physical forms to determine the consumer's eligibility for the quantity of various commodity goods allotted to him/her, decides on goods to be delivered, collects payment, weighs the deliverable goods, disburses, and updates the log entries [6].

This information can be found on the Ration Card. Depending on its location, the household is assigned to a certain ration shop from which it can only purchase its ration allotment. Obtaining the monthly ration quota from the retailer necessitates a lengthy process. a lot of manual procedures, including the physical presence of the shopkeeper confirming the legitimacy of the customer, and checking the records in physical forms to evaluate if the customer is eligible for the service. the number of different commodity goods allotted to him/her, agreeing on the items to be delivered, collecting payments, measuring the products to be delivered, disbursement, and updating the records All transactions for the day are recorded in log books [8]. With so many manual jobs and a large number of them, it's easy to get overwhelmed. The entire procedure is prone to the customers that each shop attracts. To a variety of situations

- Before going to the store, the consumer has no notion what things are available. This results in a waste of time and resources.
- Corruption and illegal practices for example, a shopkeeper selling food grain stock at a higher price on the open market, the quality of items being harmed, and so on.
- Slow processing pace people must wait a lengthy time for their rations.
- Overcharging, delivery of less quantity and inferior food grain are all examples of consumer fraud.
- The amount of work required by humans has increased, making them more prone to making mistakes.
- The ration is purchased from a specific business by the Consumer. Consumers find this cumbersome, and the ration is frequently left unused.

B. E-POS System

PDS has improved in recent years as a result of the introduction of modern technologies, particularly after the Aadhar card was introduced. In this system, known as the E-POS system, each customer first registers with the Indian government, providing all of his or her personal information, including fingerprint impressions, which are recorded and uploaded to a central database.

The consumer can take the ration after the online verification is completed. The disbursement of rations is done by hand [1]. There are some disadvantages to this system such as:

- Except authentication, rest all the system (goods disbursement) is manual
- Time consuming process

- Human intervention required

C. Drawbacks of Existing Systems

- The customer was unaware that the ration was available in the store.
- Corruption and unethical behavior are two words that come to mind while thinking about corruption and unethical behavior. For example, a shopkeeper might sell stock on the open market, overcharging consumers, especially those who are illiterate, and offering substandard items, among other things.
- The ration shop is only open for a few hours per day due to manned operations, resulting in overcrowding and delayed processing. Customers spend a significant amount of time in the store, the majority of which is spent in long lines.
- Even if there is no stock available, the ration merchant may state "No Stock Available." As a result of point 3 above, ration shops are unable to meet the needs of all clients.



Fig. 1 Traditional Ration Shop

DESIGN

For many years, the rationing system has been in place. Its main goal is to provide economical rice, kerosene, sugar, and wheat. However, with the expanding population, this method is a boon to Indian society. Rationing must be automated. In several ways, the current rationing system is unsafe [8]. As a result, there is a high level of corruption. Between consumers and dealers, there is a lack of openness, which frequently results in the consumer not obtaining his dues. Consumers frequently use unethical tactics such as giving bribes, resulting in a corrupt loop. Rationing will hasten the process and hence assist in dealing with the growing population. Even if they have already been established in the abstract, define abbreviations and acronyms the first time they appear in the text. It is not necessary to define abbreviations like IEEE, SI, MKS, CGS, sc, dc, and mms. Unless it's unavoidable, avoid using abbreviations in the title and headings [7]. The primary design constraint is the Desktop platform. Since the application is designated for the main design considerations will be desktop systems, effective GUI, and good user friendliness. It is critical to develop a user interface that is both effective and simple to use. Because we'll be using the database to store the users' varied information as well as their biometrics, storage space will be a factor in the system's seamless operation. Memory and processing power are two further factors to consider. One of the primary motivations for having an automated rationing system is to maximize efficiency [5]. It's also important to think about the input and output generated, as well as their individual functioning efficiency and contribution to the entire software application. Only if all of the software criteria are met will the software yield the expected results.

LITERATURE SURVEY

In [1] Smart card and GSM technologies are used in an e- public distribution system.

The main goal of the developed system is to replace manual labor with atomization of the ration shop in order to achieve transparency in the PDS. The proposed E-ration shop for public distribution system substitutes traditional ration cards with smart cards that contain all of the cardholder's information, such as family information, card type, and validity, among other things. The database of customers is saved on a microcontroller given by the government. Customers must scan their smart cards on a smart card reader, after which the microcontroller compares their information to that stored in order to dispense materials at the ration shop. After successful verification, consumers must enter the material kind and quantity using the keypad, and the material will be automatically shipped without the need for manual interpretation. Following the delivery of appropriate materials.

In [2] web enabled ration distribution and corruption controlling system.

The purpose of this paper is to synthesize and review existing theoretical and empirical work on corruption in order to highlight areas where more research is needed. Modernizing the PDS can be aided by computerization. As is customary, the southern states have led the way on many reforms aimed at addressing the challenges outlined above, and even poorer states are gradually changing policies and implementation methods to meet PDS issues. This study describes a strategy for controlling diversion and leakage in the delivery mechanism utilizing ICT, as well as its successful implementation in the computerization of the foodgrain supply chain. 0.78 Million farmers have gotten computer-generated checks without delay as a result of the operation. Citizen participation in the system has risen in the monitoring of PDS.

In [3] Smart ration card using RFID and GSM technique. We suggest a ration card integrating RFID (Radio Frequency Identification Device), biometrics, and GSM in this study. The RFID tag will contain the unique ID as well as information on the family members who will receive the ration. The user must exchange the tag at the ration shop and produce a thumb impression on the biometric machine. If the user is verified, the required amount and ration are selected via the keypad and displayed on the LCD display, and the commodity is delivered to the consumer. The information regarding the given ration will be communicated directly to the government and customer via GSM, making this RFID card secure against theft and forgery.

In [4] Automatic ration distribution system—A review

The purpose of this study is to offer a new application for automating the Public Distribution System. The Government of India distributes important commodities such as food grains (rice, wheat), kerosene (cooking fuel), and other necessities to a vast number of people through an extensive system known as the Public Distribution System (PDS). Currently, this system relies on human processes. In this paper, it is proposed that PDS's manual operations be replaced by a Smart Automated Ration Disbursal System (SARDS) that uses IoT. This system includes Embedded Controllers for online biometric verification of the customer, smart measurement for correct commodity disbursement, and real-time data updates on the server. Arduino and Raspberry Pi controllers are used to build a prototype system to demonstrate how it works. A solid- dispensing mechanism that works automatically. fabricated and interfaced with the controllers using solenoid valves and sensors. Robust feedback is built into the system using sensors for accurate disbursal of material and detection of theft. Finally, experimental results showing accuracy of delivery of material and time required to process one consumer request are tabulated and analyzed. This system, when deployed in actual field, is expected to be operational 24x7 and ensure safe, secure, fast and corruption-free distribution of Ration commodities to the general public.

In [5] Radio frequency identification (rfid) technology in library

This document provides an overview of various RFID-based systems that are currently in use in libraries. This review effort mentioned in this paper compiles practically all important material about RFID, its various components, and its application and implementation in libraries. This study also explores innovative RFID ideas in libraries, such as how it may be utilized as an anti-theft device to handle the problem of missing books. The author has attempted to convey the importance and usability of RFID in libraries, as well as the concept of up-gradation, by focusing on the RFID system's advantages.

AIM AND OBJECTIVE

- **Aim:** Our aim is to provide an interface where user data confidentiality as well as security in the cloud and to provide a secure and smart way of distribution of ration.
- **Objective:** In order to track the inventory and confirm the number and size of the food. There will be another Android app (End User) for customers where they can simply check the food stock available at the store [6]. We are introducing the e-Ration System in order to make it more efficient and improve the present PDS system. In this project, we'll use an IoT device and an Android app for customers and shopkeepers, as well as a web-based PDS system. There will be a Web Portal (Admin) where the PDS department will update the stock on the web portal whenever they deliver the food item stock to the shopkeeper so that we can simply follow the supply quantity of food and remove the guess workstation shop or and also able to check the price of food and available quantity of food at ration shop and with this app customer will be able to see its previously buy food transaction details and family details and they will also have one QR code in this app. The IOT device is responsible for scanning the customer.

CONCLUSION

Smart public distribution system based on the Internet of Things is an automation system that is a replacement for current fair price stores. Fingerprint authentication employs a Minutiae extraction-based technique, making the system more safe and precise. It eliminates false ration card holders and safeguards the interests of ordinary citizens, maintaining food security in the country. The level of corruption can be reduced by using its performance. The system will get smarter and more robust by selecting the commodity and amount using the Android app. It will contribute to the country's economic growth. In comparison to the other system, the automated PDS is simple to establish and involves far less effort. Because there is no human operation in this system, it is possible to avoid mistakes.

REFERENCES

- [1]. Priya, B. G., & Nikumbh, S. (2017, December). "E— Public distribution system using SMART card and GSM technology". In 2017 International Conference on Intelligent Sustainable Systems (ICISS) (pp. 244-249). IEEE.
- [2]. Pingale, D., Patil, S., Gadakh, N., Avhad, R., & Gundal, S. (2013). "Web enabled ration distribution and corruption controlling system". International Journal of Engineering and Innovative Technology (IJEIT) Volume2, (8).
- [3]. Agarwal, M., Sharma, M., & Singh, B. (2014, September). "Smart ration card using RFID and GSM technique". In 2014 5th International Conference- Confluence the Next Generation Information Technology Summit (Confluence) (pp. 485-489). IEEE
- [4]. Kurkute, S. R., Medhe, C., Revgade, A., & Kshirsagar, (2016, March). "Automatic ration distribution system—A review". In 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom) (pp. 11-13). IEEE
- [5]. Ojha, N. (2018, January). "Radio frequency identification (rfid) technology in library: Advantages and issues". In 2018 2nd International Conference on Inventive Systems and Control (ICISC) (pp. 1206-1213). IEEE.
- [6]. Yuan, W., Lixiu, Y., & Fuqiang, Z. (2007, August). "A real time fingerprint recognition system based on novel fingerprint matching strategy". In 2007 8th International Conference on Electronic Measurement and Instruments(pp. 1-81). IEEE.
- [7]. Tirthkar S, Kijbile S., Magdum S., Gaikwad P. (2017). "Android Based Ration Card System using Biometric and SMS Gateway". International Engineering Research Journal (IERJ), pp. 4197-4201.
- [8]. Prasad, A., Ghenge, A., & Zende, S. (2017, March). "Smart ration card using RFID, biometrics and SMS gateway". In 2017 International Conference on Inventive Communication and Computational Technologies (ICICCT) (pp. 347-350). IEEE.
- [9]. Noor Adibha, Saumya Priyam, V Pathak, S Shandilya Automated Ration Distribution system using RFID/UID and IOTI vol. 6 Issue-1-2, pp. 148-152, 2017.
- [10]. Subhasini Shukla, Akash Patil, Brightson Selvin —A Step Towards Smart Ration Card System Using RFID and IOT
- [11]. Neha Sharma., Ayushi Gupta., Vinod Ghadge., & Mayank Harwani. (2017, march). "IoT Based Ration Card System Using Bluetooth Technology". In 2017 International Journal of Engineering Science and Computing (IJESC) volume7, (3).
- [12]. Subhasini Shukla., Akash Patil., & Brightson Selvin. (2018). "A step towards smart card system using RFID and IoT". In 2018 International conference on smart city and emerging technology (ICSCET).