Automated Public Ration Distribution System

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Abstract: The Public Distribution System (PDS) in India is the largest retail system in the world. Major problems in this system are the inefficiency in the targeting of beneficiaries, improper weighing machines used and illegal selling of goods. Automated public ration distribution system aims to replace the manual work in public distribution system thereby reducing the corruption and illegal selling of stocks. The ration distribution system is automated so the users can buy the products whenever they want to buy. The conventional ration card is replaced by smart card which has QR code. The QR code redirects to the webpage of the shop and the required items are selected and payment is done and then the items are collected from the machine. In this system, the government has control over all transaction that occurs in ration shop and all the stock records are updated to the government database so as to refill the stock with materials thereby reducing the corruption.

Keywords: Public Distribution System, Central Database, Smart Card, GSM Module, Subsidied.

I.INTRODUCTION:

Public distribution system (PDS) is an Indian food security system. Established by the Government of India under Ministry of Consumer Affairs, Food, and Public Distribution and managed jointly with state governments in India, it distributes subsidized food and non-food items to India's poor people. This scheme was launched in India on June 1997. Major commodities distributed include staple food grains, such as wheat, rice, sugar, and kerosene, through a network of fair price shops (also known as ration shops) established in several states across the country. In coverage and public expenditure, it is considered to be the most important food security network. Today, India has the largest stock of grain in the world besides China, the government spends Rs. 750 billion ($13.6 billion) per year, almost 1 percent of GDP, yet 21% remain undernourished. Distribution of food grains to poor people throughout the country is managed by state governments. As of date there are about 500,000 Fair Price Shops (FPS) across India.

The central and state governments share the responsibility of regulating the PDS. While the central government is responsible for procurement, storage, transportation, and bulk allocation of food grains, state government hold the responsibility for distributing the same to the consumers through the established network of Fair Price Shops (FPSs). State governments are also responsible for operational responsibilities including allocation and identification of families below poverty line, issue of ration cards, supervision and monitoring the functioning of FPSs. However, there are concerns about the efficiency of the distribution process.

The Government of India is having a UID (Unique Identification) number system called AADHAR number, which contains all general information like age, count of family, finger print of the family, address, contact numbers, bank account information

etc. for every resident in the country. Using the AADHAR number and the contact details, the Government can send a message (SMS) to the individuals, containing information regarding quality and quantity of products allotted to him/her in a respective ration shop. The person would have to show the smart card on the system placed at ration shop counter. The reader detects the card and redirects to the shop webpage. The username and password is entered by the user for safe transaction. The required materials are selected by using the checkboxes. Then payment is made either through payment gateway or using wallet. Central database is updated about the stock details immediately after every transaction.

II.RELATED WORKS:

Existing research efforts related to automate the public distribution system mostly consists of using RFID smartcards and GSM module. These systems are used for reducing the human power in the public distribution system. Automated system uses a RFID card and is used for user authentication. The RFID card is interfaced with the microcontroller (AT89C51) and PC via RS232 to develop such a system [1].An efficient method for the user to buy the products in the ration shop is by just flashing the card at the RFID reader at the ration store. 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. Here the user can check their purchase details in a dedicated website [2].

The proposed methodology for automation in ration shop is to reduce the improper measurements in the ration shop due to various factors. Further updating to the government database about the stock availability and the customer details were not carried out [3]. The automated system is based on radio frequency identification of customer. Here each customer is provided with RFID cards. In this system, by using RFID and by entering the password we can access the website. Through valve, grain will come and it will get weighted by weight sensor. Once the count is reached the entered amount controller automatically shut down the valve and updates the account of the customer. The updated account information is send to the customer's mobile using GSM module. In this system the data base of customers can be made with their account details, password etc. [4].

The proposed concept is to RFID tag is used for authentication and the automatic distribution is done with microcontroller. For updating GSM is used. Along with updating GSM is used to alert the customer about the arrival if goods in the shop and to inform that government has allotted this much quantity for them [6].The controller checks the customer codes and details of amounts in the card. After verification, these systems show the amount details. The customer need to entered the required materials by using the keyboard, after receiving the materials controller send the information to government office and customer through GSM technology. In this system microcontroller is used for executing the process [7].

III.HARDWARE AND SOFTWARE

The following components are used in this project

1. CENTRAL DATABASE:

A centralized database (sometimes abbreviated CDB) is a database that is located, stored, and maintained in a single location. This location is most often a central computer or database system, for example a desktop or server CPU, or a mainframe computer. In most cases, a centralized database would be used by an organization or an institution. Users access a centralized database through a computer network

which is able to give them access to the central CPU, which in turn maintains to the database itself. All of the information stored on the CBS is accessible from a large number of different points.

ADVANTAGES:

Centralized databases hold a substantial amount of advantages. Some of them are listed below:

- Data integrity is maximized and data redundancy is minimized, as the single storing place of all the data also implies that a given set of data only has one primary record. This aids in the maintaining of data as accurate and as consistent as possible and enhances data reliability.
- Generally bigger data security, as the single data storage location implies only a one possible place from which the database can be attacked and sets of data can be stolen or tampered with.
- Better data preservation than other types of databases due to often-included fault-tolerant setup.
- Easier for using by the end-user due to the simplicity of having a single database design.
- Generally easier data portability and database administration.
- More cost effective than other types of database systems as labour, power supply and maintenance costs are all minimized.
- Data kept in the same location is easier to be changed, re-organized, mirrored, or analyzed.
- All the information can be accessed at the same time from the same location.
- Updates to any given set of data are immediately received by every end-user.

2. E- Wallet System:

E-Wallet grants the government a secured pre collected way of e-payment transactions without any physical cash. This module provides the ability to define and manage E-wallet accounts as well as grant a high level of accounts security and maintainability. It provides all types of service consumers (institution and individuals) with the ability to have their own E-wallets accounts as well as easy means of usage, loading, inquiry within secured and safe conditions. E-wallet can be rechargeable by different methods such as Credit / Debit cards, direct bank account and scratch off cards. Transferring balance from master E-wallet to another is available feature. All payment transactions by an E-wallet will be logged. Whenever a transaction takes place, money is withdrawn from the account linked to the e-wallet.

3. DISPLAY WITH KEYBOARD:

The display screen is used for viewing the website and keyboard is used for entering the username and password and for selection of materials by the user.

4. MOTOR DRIVER:

A motor driver is a little current amplifier; the function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor Relay and solenoid switching.

5. DC MOTOR:

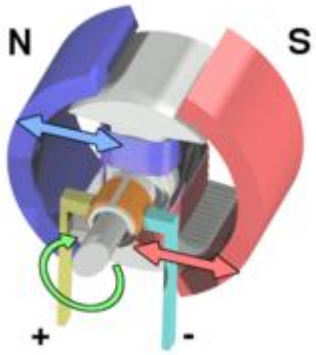

Figure 1: DC Motor

A DC motor is any of a class of electrical machines that converts direct current electrical power

into mechanical power. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic to periodically change the direction of current flow in part of the motor. Most types produce rotary motion; a linear motor directly produces force and motion in a straight line. DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances.

6. RELAY:

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

7. SOLENOID VALVES:

These valves are used to stop the flow of a fluid or start the flow of a fluid in a piping configuration. A 2way valve has two port connections-a pressure or input port and an outlet port. Usually, a 2-way valve is referred to as a 2/2 valve, which means the valve has two ports and two positions. The positions are: 1) on or energized and 2) off or de-energized. Operation is a word used to describe if a valve is normally open (NO), normally closed (NC) or universal (U). NO and NC refers to the state of a 2-way solenoid valve when de-energized or off. The type of solenoid valve refers to whether that valve is a 2-way, 3-way or 4-way.

Figure 2: Solenoid Valve

IV.FLOW CHART

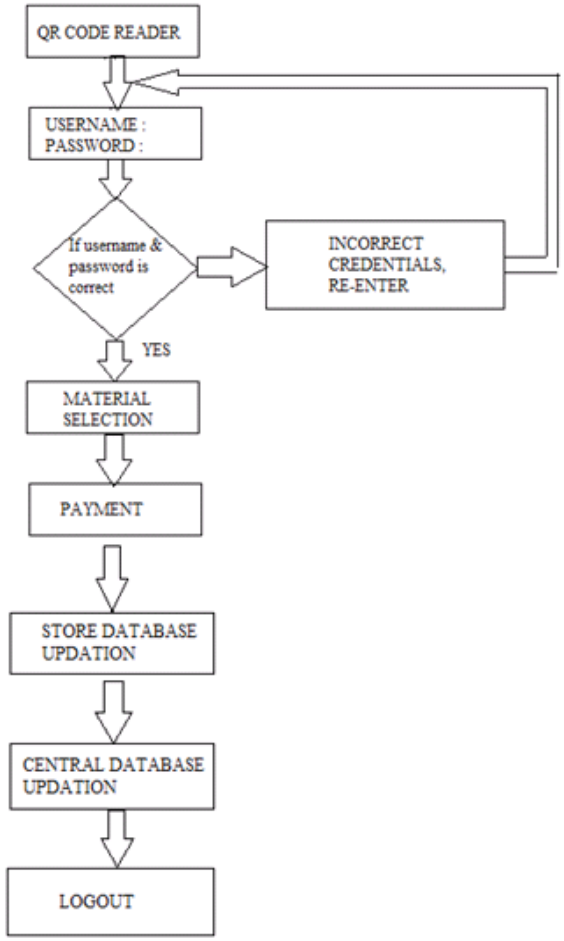

Figure 3: Flow Chart

V.METHODOLOGY

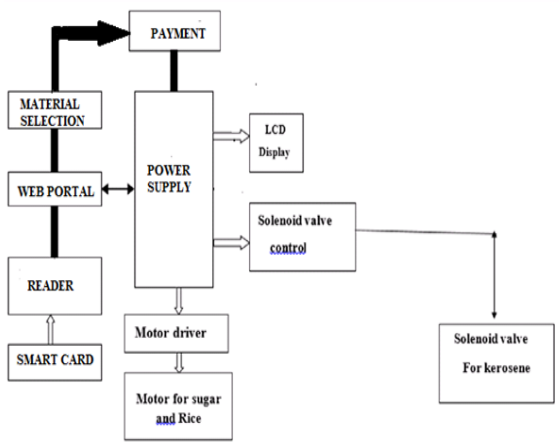

Figure 4: Block Diagram

The user shows the smart ration card which has QR code to the QR code scanner, the card is detected by the card reader and the webpage is redirected to the ration shop web portal. For implementing secure transactions the user enters the username and password with the help of a keyboard. Then the available products will be shown in the display. The user selects the products to be bought with the help of check boxes and the next button is clicked. Then the page is redirected to the payment portal where the bill amount for the product purchased is paid with the help of secure transaction mode. The payment method is either by using directly customer's bank account with the help of credit card, debit card and net banking services or E-wallet. Whenever a transaction takes place, money is withdrawn from the account linked to the e-wallet. After payment completion the motor driver receives signals and the DC motor which acts as valves rotates and make way for the product to flow from the storage tank to the user. The DC motor is controlled using time delay circuits so it is an efficient method and a cheap method for implementing. Similarly the valve for kerosene is also controlled in a same way. Once the transaction is complete the stock purchased by every user is recorded and the stock is reduced form the total store stock. The central database is also updated with every transaction and each shop stock is monitored regularly. If a shop stock is less than a particular value the central government transports and fills the shop with the food products. In this way the unavailability of stocks can be reduced and the poor people are highly benefitted.

VI.CONCLUSION

This system is used for automating the public distribution system so as to provide a safe, secure and efficient way of public distribution system to reduce corruption, improper scaling and malpractices. It also solves the problem of manual process in public distribution system and significantly improves the current process. This system has greater scope as users can purchase materials whenever they want to buy the product. No manual data is entered by the store officials and all information is stored and recorded in database with less risk of data loss, compared to a manual filing approach. All transactions are monitored by the central government and the stock details of the stores are also updated with every transaction so the stock from the central government can be sent when the stock gets over in the store. This helps to reduce the unavailability of the food products. This technology will create a revolution and helps to reach the food products to the needy people properly.

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