Fully Automatic Ration Distribution System

Pallavi Anil Gangurde
Department of Electronics & Telecommunicatio.,
ASSISTANT PROFESSOR,
Vivekanand Education Society's Institute Of Technology(V.E.S.I.T.),
Collector's Colony,
Chembur, Mumbai – 400074, INDIA.

Abstract

Ration Distribution System means distribution of essential commodities to a large number of people. It is done by the government. Public distribution system is one of the widely controversial offices that involve corruption and illegal smuggling of goods. All this happens because every job in the ration shop involves manual work and hence there are no specific high-tech technologies to automate and monitor the job. Our main objective here is to automate the process of the distribution. The classical method involves customer to tell the person handling the ration shop outlet, the quantity of the commodity he/she needs along with its category/type. The person working in the shop then measures the commodity and gives it to the customer. In our version of the system, we will develop an embedded system project where we will have the customer to input the quantity of a commodity that he requires and the system made will automatically collect that much quantity of the required commodity in a container. It is a relatively new concept which takes into account the various social, economic and general aspects relating to technical as well as day to day disciplines. The proposed automatic ration shop for public distribution system is based on Radio Frequency Identification (RFID) technology that replaces conventional ration cards. The RFID tags are provided instead of conventional ration cards. Customer's database is created and is stored in a microcontroller chip which is provided by Government Authority. Customer needs to scan this RFID tag to RFID reader, and then microcontroller checks customer's details to supply commodities in ration shop. After successful verification, customer needs to enter type as well as quantity of commodity using a keypad. After the goods are purchased the amount of the commodity used will be deducted from the customer's account and the balance will be shown.

Introduction (TNR -12)

Public distribution system (PDS) was launched in India on June 1997. The fair price shops are mainly used to distribute the goods with a reduced cost or at times free of cost. It is a concern of India's public distribution system implanted by Government of India, which distributes rations at a subsidized cost to the poor. In India approximately 500000 fair price shops are available. Here the Major commodities distributed include essential food grains, such as wheat, rice, sugar, along with oil and kerosene. The central and state governments jointly take the responsibility of regulating the PDS. While the central government is obligated for procurement, storage, conveyance, and majority allocation of the food grains, the state governments holds the province for distributing the aforesaid to the consumers through the ingrained network of Fair Price Shops (FPSs). State governments are also responsible for functional obligation, including allotment and identity of families below the poverty line, issue of ration cards, superintendence and monitoring the functioning of FPSs. The Indian ration card is the authority of the Indian peoples. This is mainly used for buying supported food and fuel (LPG and kerosene). It is an important livelihood tool for the misfortunate, providing proof of personal identity and link with government databases. India's public distribution system (PDS) runs based on the ration card, including its purpose of identification, eligibility, and entitlement. The poverty lines are identified depends upon the

annual income of that particular family. Depends upon the family incomes the ration card colour is decided. The different colours of ration cards are navy blue (BPL), white (APL) and orange (AAY). A below poverty line (BPL) correspondence bearer should be collected 35 kg of food grain and the card holder above the poverty line should be collected 15 kg of food grain as per the norms of PDS. Up to the age of 12 years, a half unit ration materials are issued and full unit ration materials is issued in case of age more than 12 years. In fair price shops presently the peoples are facing so many problems like corruption, wastage of time and no proper material distribution.... etc. to overcome this problem here we have proposed a system to dispense all the materials automatically and also maintain the stock details properly.

RFID FOR PDS

Today we are facing a number of transport related problems. RFID technology IS effectively used to solve some of them. RFID can act as ration card and also as a RC book, storing details like -insurance details, service details etc. Radio-frequency identification (RFID) based access-control system will allow only authorized or liable person to purchase the commodity from the ration shops. An RFID system consists of an antenna or coil, a transreceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. There are many types of RFID systems available in the market. RFID's are classified based on their frequency ranges. Some of the most commonly used RFID kits are low-frequency (30-500 kHz), mid-frequency (900 kHz-1500MHz) and high-frequency (2.4-2.5GHz). Also RFID tags can be of two types: viz. Active tags (having on chip battery) and Passive tags (without any inbuilt batteries). The passive tags are lighter and less expensive compared to active tags [1]. An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost every household has an oven, and tens of millions of them are using it every-day, but only a few of them must be aware that a processor and software is involved in the preparation of their meal. This may even be the case in our desktops/laptops used at homes, which also comprises of computer hardware and software and mechanical components (disk drives, for example). However, a personal computer is not designed to perform a specific function rather; it is able to do many different things. Many people use the term general-purpose computer to make this distinction clear. As shipped, a general-purpose computer is a blank slate; the manufacturer does not know what the customer will do with it. One customer may use it as a network file server another may use it exclusively for playing games, and a third may use it to write the next great American novel. If an embedded system is designed well, the existence of the processor and software could be completely unnoticed by the user of the device. Such is the case for a microwave oven, VCR, or alarm clock. In some cases, it would even be possible to build an equivalent device that does not contain the processor and software. This could be done by replacing the combination with a custom integrated circuit that performs the same functions in hardware. However, a lot of flexibility is lost when a design is hard-cooled in this way. It is much easier, and cheaper, to change a few lines of software than to redesign a piece of custom hardware [2].

WORKING

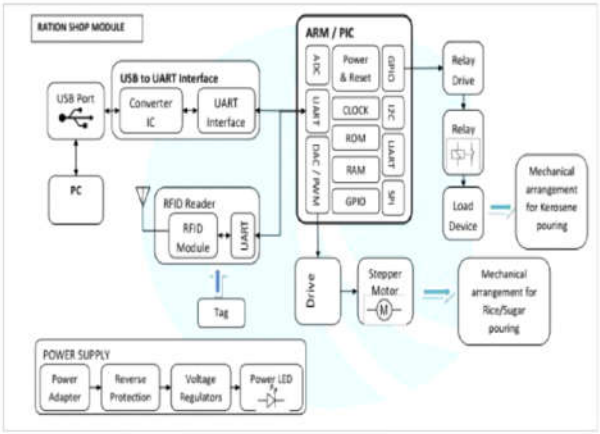

Figure 1: Block Diagram.

Automating the Ration distribution system is our proposed solution to the various existing problems. The various things that we can do to automate this system are explained below. The quantity of the required commodity can be entered into the application running on the computer at the outlet by the customer himself. Every customer will be given a specific card which is RFID based, which will help the machine to identify the customer details when swiped over the RFID reader. Every RFID card can have a unique RFID number which will be serially collected by RFID reader. This number will then be compared with the RFID numbers pre-registered in the shop database. This database will contain the biometric details of all the customers along with other details like: residential address, current photograph, contact information, the remaining balance, etc. The program will also help in managing the balance (in rupees) of the customer. In order to buy ration user have to swipe RFID card and details will be automatically loaded. An option will be obtained on HMI for customer to enter the amount of commodity required. Once the quantity is entered, the employee can place a container on the weighing machine. When the start button is clicked, the valve for that commodity will be opened and the required commodity will start accumulating in the container. The valve will be opened by a signal sent by microprocessor to the respective DC motor interfaced. The weight will keep on increasing. Real time weight can be observed on the weighing machine. When the required amount of grains is reached, a pre set timer will trigger the motor and the valve will get closed. Then an update in the customers profile will be initiated. This updates will involve deduction of money from original balance and replacing new balance with the original one. Also, new entries in current system can be added. HMI contains an option named as 'customer enrolment'. By selecting this option new customers can be added. For enrolment customer need to enter fields like full name, residential address, contact information, etc. This data will then be linked with the respected RFID card which is swapped. This process will automatically get updated in the customer's database. Thus the main fallacies involved in the fooling of customer where they receive lesser amount of commodity than what they have asked for, due to which they ended up paying more, also other problems in the existing ration card system like making false entries or double entries etc., can also be dealt with by implementation of the system.

FUTURE SCOPE

The proposed Automated Rationing System can be scaled up for a large number of items which can be selected from one controller itself. This proposed system can also be used in

other places like malls, supermarkets, etc. The system gives ease of access, removes the constraint on time for various types of applications and also helps in reducing malpractices. Further, the system can also be linked with the Adhaar cards, which will be beneficial for the customer as well as easier for the governing authority as customer validation and identification will be authorized. In order to further improve the system a GSM Module can be used to notify the customer regarding the transaction made by them making the system more user friendly. Another way of making the system more user friendly is by linking the system with the money transactions apps such as Paytym, Mobikwik, etc. The application of this particular system is not only limited to ration shops but it can be implemented in various other domains.

CONCLUSION

Through the proposed system, we intent to introduce a new technology which helps to remove the drawbacks of the existing Ration system used in India. The proposed system can effectively act as an anti-corruption tool. Also the system is automatic and user friendly so that it is beneficial for the customer as well the Vendor.

References

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[2] Rajesh C. Pingle_And P. B. Boroley, Automatic Rationing For Public Distribution System (Pds) Using Rfid And Gsm Module To Prevent Irregularities, HCTL Open IJTIR, Volume 2, March 2013.