RFID AND FINGERPRINT BASED PUBLIC DISTRIBUTION SYSTEM USING IOT

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ABSTRACT

Public distribution system i.e rationing distribution is one of the widely controversial issues that involve corruption and illegal smuggling of goods. One reason for this to happen is because every job in the ration shop involves manual work and there is no specific technology involved in automating the job. Involvement of manual work calls a lot of irregularities. Ration card plays a vital role for the household details such as to get the gas connection, family member details, it acts as address proof, etc. In this paper, we have proposed a smart ration card system using Radio Frequency Identification (RFID) Technique and IoT to prevent the malpractices and corruption in the current ration distribution system. In this system, conventional ration card will be replaced by a unique RFID tag. The RFID card has a unique identification number and details of a consumer. The consumer scans the card on RFID reader which is interfaced with microcontroller kept at ration shop. Once a consumer is validated by the mean of Biometric, the system shows customer'sproduct Based on the material chosen by the consumer, the appropriate bill will be generated and the consumer gets the material. The proposed RFID and Biometric based automatic ration shop system would bring transparency and prevent malpractices.

Keywords: RFID Reader, Fingerprint Sensor, Arduino Mega, GSM, IOT

I.INTRODUCTION

India's Public Distribution System (PDS) with a network of 4.78 Lakh Fair Price Shops(FPS) is perhaps the largest retail system in the world. Major problems due to this system are the inefficiency in the targeting of beneficiaries and the resulting leakage of subsidies. The TPDS system today supports over 40 crore Indians below the poverty line with a monthly supply of subsidized food grains.

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, the fingerprint 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.

People who are accessing the ration shop for subsidies in the cost of products would allow a smart card that is electronic ration card. The automatic rationing system, installed at the ration shop which contains interface GSM. Radio Frequency Identification (RFID) Technique and IOT are used to prevent the malpractices and corruption in the current ration distribution system. All these interfaces are interfaced to the Arduino MEGA. Embedded PIC Microcontroller is interfaced to the PLC and further to the central database of the government. The person would have to swipe the card on the system placed at the ration shop counter. After that for security authentication and to prevent card misuse, the system would ask for the fingerprint detector to detect the correct consumer. The inputs are given by the consumer and select the products by the consumer itself. A central database would be updated immediately after every transaction made by the users.

II.EXISTING SYSTEM

RATION CARD SYSTEM

Ration card was first time introduced in India during World War II to supply food grains, sugar and kerosene oil at a relatively cheaper rate. Ration card acts as the address/identity proof of a person. It includes the identity of the person along with his family members, their names, ages, gender. According to a number of members in the family, the ration will be given in that proportionate ratio. The manual ration card that is commonly used now is shown in figure .1 below.

FIG .1 PICTORIAL REPRESENTATION OF CURRENT RATION CARD

Ration card is a very necessary document for every citizen in India. Ration the card is used to purchase various necessary items like sugar, oil, etc. from the ration shops at a cheaper rate, issued by the government. This ration card also acts as address as well as identity proof. Ration card is needed when you apply for a passport, PAN number, driving license, etc.

Hence, the ration card is a very important document. But, the current ration card system has a drawback, that if the items are not sold up to the last of the month, then the shopkeeper will sell it to someone else and take the profit into his pocket and put some false reading in the government record diary.

Many problems with the PDS ration system exist. There are millions of ineligible and fraudulent ration cards at the same time, millions of poor families have no ration card. PDS shop owners in collusion with government officials divert the subsidized food supply and petroleum to the black market. Card numbers are inflated by those held under false or duplicate names, in the names of dead people, or by real but ineligible people.

III.PROPOSED SYSTEM

The proposed system replaces the manual work in the ration shop. The main objective of the designed system is the automation of the ration shop to provide transparency. The proposed automatic FPS for the public distribution system is based on RFID technology and biometric authentication technology that replaces conventional ration cards. The RFID cards are provided instead of conventional Ration Cards. Beneficiary's information along with the fingerprint impression of the head of the family and one of the family members is stored in the centralized database which is only updated or accessed by the government authority. A customer has to scan the RFID Card by using RFID reader and then he/she should scan the thumb through a biometric scanner, after successful verification of the customer, information is fetched onto the main interface, and shopkeeper needs to enter a type of ration as well as a quantity of ration using a keypad. After delivering proper ration to him/her, the beneficiary is sent the SMS (Short Message Service) about the commodities bought by him.

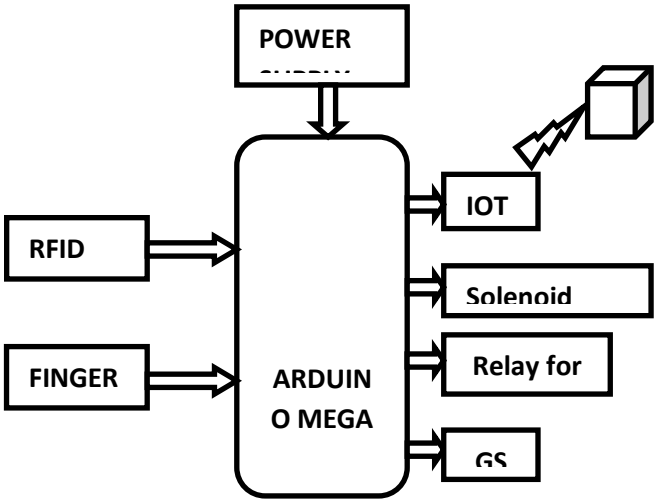

Fig 2 : Architecture

In the block diagram of smart ration card system Arduino Mega 2560 microcontroller board which is based on ATmega 2560 microcontroller, RFID reader, RFID tags, ESP8266 Wi-Fi module, and power supplies. In this system, the transmitting pin of the RFID reader is connected to one of the receiving pins (RX0) of the Arduino. One transmitting pin (TX1) and one receiving pin (RX0) of the Arduino is connected to the receiving pin and transmitting pin of the Wi-Fi shield respectively. Wi-Fi shield is used for connecting the system to the internet. In this fingerprint sensor is connected to the Arduino controller. The fingerprints will take and then check the validity or the invalid user. After the fingerprint verification, the required product is distributed. In this system, the required product is selected through the IOT. When the product is delivered this system sends the delivered product details to the user through GSM.

IV.CONCLUSION

The Smart ration card system proposed in this paper uses RFID technology and Cloud services. This system successfully eliminates the errors due to manual monitoring of ration data as all the data is automatically updated in the cloud-based database. This proposed system can provide a safe, secure and efficient way of Public Distribution System. By using this technique in ration shops solves the problem of a too much manual process in the Public Distribution System (PDS). This proposed system definitely eliminates corruption in Public Distribution System of India. This new technology gives a solution and this work will make a great change in Public.

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