

OPTIMIZED RATION CARD SYSTEM,

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ABSTRACT

India's Public Distribution System (PDS) is the largest food distribution system in the world. Public distribution system provides a ration card issued under an order or authority of the State Government for the purchase of essential consumer materials like rice, wheat, kerosene and oil. State Government issues distinctive ration cards like yellow ration card, saffron ration card, and white ration card depending on family annual income. The consumer material is distributed to ration card holders in the first week of every month by ration shopkeeper. Public Distribution System is one of the systems that involve malpractice. The ration shop owner illegally uses consumer materials without prior knowledge of ration card holders. The proposed system aids to control malpractices which are present in ration shop by replacing manual work with automatic system based on RFID. Every consumer i.e. family head will be provided with a RFID card which acts as ration card. The RFID card has unique identification number. The consumer scans the card on RFID reader which is interfaced with microcontroller kept at ration shop. Once consumer is validated by details, the system shows customer's ration details and cost. Based on material chosen by consumer, the consumer will get the ration and he will pay through dummy payment gateway. The proposed RFID based automatic ration shop system would bring transparency in public distribution system and become helpful to prevent malpractices.

Keywords: RFID, Biometric, GSM, Ration Card.

I. INTRODUCTIONS

A public distribution shop is a part of India's public distribution system established by Government of India which distributes rations at a subsidized price to the poor. Locally these are known as "ration shops" and chiefly sell wheat, rice and sugar at a price lower than the market price. Other essential commodities may also be sold. To buy this items one must have a "Ration Card".

A below poverty line (BPL) card holder should be given 35 kg of food grain and the card holder above the poverty line should be given 15 kg of food grain as per the norms of PDS. However, there are concerns about the efficiency of the distribution process.

The present public distribution system has some drawbacks such as:

- Growing instances of the consumers receiving inferior quality food grains in ration shops.
- Many PDS dealers resort to malpractice, illegal diversions of commodities, holding and black marketing due to the minimum salary received by them.
- Illicit fair price shop owners have been found to create large number of bogus cards to sell food grains in the open market.

- Distribution to granted PDS services has been highly irregular and diverse in various states.
- There are no set criteria as to which family is BPL and which APL is.

So to avoid this, we move towards a optimized ration card system using RFID, Biometrics and GSM technique.

In the proposed system each ration shop contains a RFID reader which reads the RFID card, RFID reader is used to check whether the user is valid or not. Biometrics is used to identify the user. It stores fingerprints of users into the database. GSM is used to send the information of ration taken to the government and also to the customer. This new produced system will solve all the above problems effectively.

II. EXISTING WORK

RFID is a short range wireless communication system which uses radio frequency technology for automatic target recognition. It consists of three parts: labels, antennas and readers. The technology used to identify every individual uniquely is known as biometrics. Biometrics also refers to the pattern recognition system where the users' bio data is being referenced from the database. GSM (Global System for Mobile Communications) is applied where mobile phones connect to other cells in the immediate locality.

RFID is different from other technologies because it contains all the sensor tags embedded in the tracked object itself. RFID is mainly used for automatic identification. The authentication is a process of verifying the legal user; it can be based on possession factors, knowledge factor, and biometrics. The Multifactor Authentication (MFA) requires the combination of two or more layers of authentication. Biometric system refers to the various single components like various sensors, matching algorithms and result.

GSM is used by digital cellular networks and mobile phones. GSM includes a base station a network and switching sub system. In paper [1], the authors have proposed a system which contains door locking system which makes use of passive type of Radio Frequency Identification (RFID). A typical RFID system includes three basic elements: RFID tag (transponder), reader (transceiver) and back-end application system (or database). For controlling, management, transaction and operations of various users' software is used. Hardware as well as software is used in this system. In addition, the author has used actuator i.e. stepper motor for this purpose. The author has successfully implemented security system which can record attendance in class room of institute or in a secured zone so that only authentic person can enter in secure space.

In paper [2], the author has proposed a concept of Multifactor Authentication (MFA) a specific step for confirming whether the system is claimed to be is authentic, where there a different factors of authentication such as knowledge factor, possession factor and lastly a inherence factor. If by any means the non-user personal has successfully broken the first security barrier he still has to break in the other layer too making it hard to break in the target. In paper [3], the authors have developed a system that provides real time security managing methods that can be implemented using RFID, Biometric and Smart Messaging. In this system a real time security management system is developed using fingerprint (optical) as Biometric and ISO 14443 Mifare 13.56 MHZ smart cards to control the entry of staff to various sections for security purpose and for attendance monitoring. Fingerprint dynamics is a recently introduced behavioral biometric technique based on the time derived parameters from multi instance finger scan actions. Principal Component Analysis (PCA) is a popular technique for dimensionality reduction and has been applied to a wide number of applications. In paper [4], a

method based on PCA is followed, which selects the most dominating features subset out of the feature pool at hand, without transforming the original features.

Authentication based on fingerprint has a lot of disadvantages such as it can be made foolproof by any unknown person. Finger vein is a non-forgable pattern and it provides high end security as vein images are taken from live body. In paper [5], the finger vein patterns are preprocessed, features are extracted by applying Gradient boosted feature algorithm technique and labeled using SVM classifier and they are used for authentication purpose. The main objective of paper [6] is to design and implement a digital security system which can be deployed in secured zone where only authentic person can enter. The authors have implemented a security system containing door locking system using passive type of RFID which can activate, authenticate, and validate the user and unlock the door in real time for secure access. In paper [7], we have developed a smart ration card, the usage of Radio Frequency identification (RFID) method to save you the ration forgery as there are chances that the shopkeeper may additionally promote the material to a person else and take the earnings and located a few fake amount in their statistics. This clever ration card is unfastened from robbery due to the fact the facts approximately the introduced ration could be send at once to the government without manual feeding using (GSM) approach. Security is an integral part of our life, be it personal or providing it for our belongings. In paper [8], the authors have developed a three level security system by using RFID and GSM.

The purpose of paper [9] is to develop a wireless system to detect and maintain the attendance of a student and locate a student. Here the server application will be built using Vb.net and the website will be built using Asp.net as integrity between them is very strong. The proposed scheme in paper [10] presents the real time security managing methods that can be implemented using RFID, Biometric and Smart Messaging. Staff details, time of entry/exit get recorded in the Oracle 10g Database which is used for their attendance processing. Biometric reader is developed using Software Development Kit (SDK), interface to GSM modem through AT commands and Smart Card programming & Oracle programming is made for server interface. The main objective of the designed system in paper [11] is the automation of ration shop to provide transparency. 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 stored in microcontroller which is provided by Government Authority. The paper[12] focuses on creating a MIS (Management Information System) system of student using both RFID and biometric (face detection) technology. The system will provide the SMS alerts service which will give information about students attendance, marks etc.

III. TECHNOLOGY TO BE USED

System uses RFID and Biometrics techniques for verification and validation of users.

RFID:

Radio Frequency identification is a technology for non contact and automated identification. It is a concept in which unique items are identified by using radio waves. RFID systems are built up of three components:

1. Readers (interrogators)
2. Antennas and
3. Tags (transponders) that take the data on a small microchip.

Now a day's RFID technology is used in many applications, including security and access control, transportation and supply chain tracking etc. Many types of RFID exist, but at the highest level, The RFID devices are divided into two broad classes: Active and Passive.

Passive tags are not embedded and its working distance can reach up to 1 mile.

Active tags are embedded with batteries its working range can reach as far as several hundred miles.

The other one is called Semi-passive tag, and its working range can extend up to 10 miles.

Two types of chips are available on RFID tags, Read-Only and Read-Write. Read only chips are fixed during the manufacturing process with unique information stored on them. The information which is on read-only chips can never be changed.

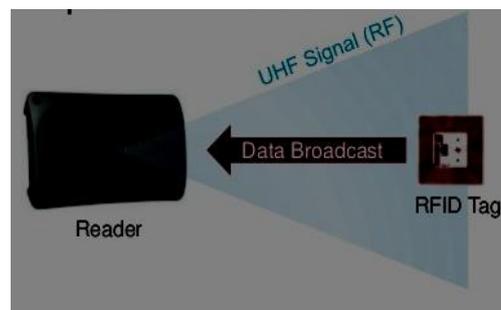


Fig 1. Passive RFID tags

AES algorithm:

The Advanced Encryption Standard or AES is a symmetric block cipher used to protect classified information and is implemented in software and hardware throughout the world to encrypt sensitive data.

The features of AES are as follows –

- Symmetric key symmetric block cipher
- 128-bit data, 128/192/256-bit keys
- Stronger and faster than Triple-DES
- Provide full specification and design details
- Software implementable in C and Java

Biometrics:

Biometrics refers to technologies that measure and analyses human body characteristics. Biometrics authentication is used in computer science as a form of identification and access control, In our project we will use biometrics to analyze fingerprint. In this proposed system we will use the biometrics for security purpose.

Scan fingerprint



Fingerprint

Fig 2. Biometrics

IV. PROPOSED SYSTEM

In this proposed system conventional ration card is replaced by RFID (smart ration card) in which all the details about users are provided including their bank details which is used for user authentication. It proposes to use smart card instead of manual ration card with Biometrics for unique authentication.

Main perspective of this system is to avoid frauds in Ration shops and to provide some technology based environment to government sector.

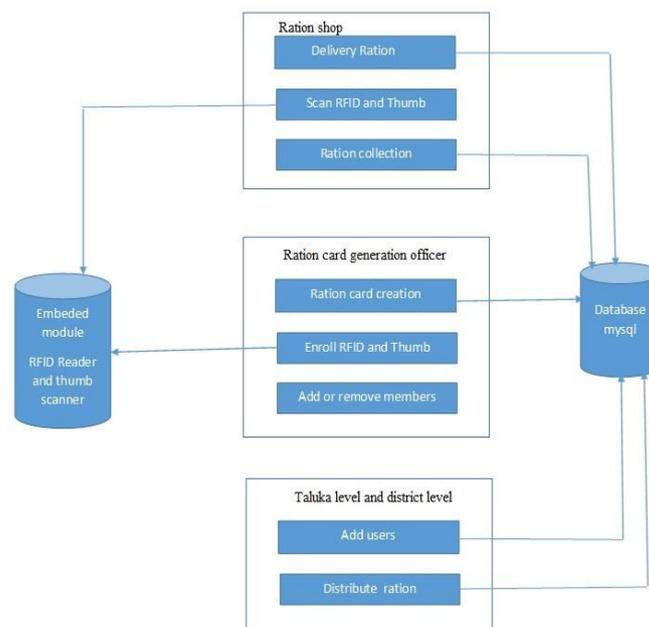


Fig 3. Block Diagram

4.1. PRODUCT FUNCTION:

- Initially the civilian (user) will get registered to the system at ration card registration office i.e. (his thumb will be scanned and stored in database, a RFID card will be given for identification)
- Whenever the user will go to the shop for receiving the ration he has to give the RFID card first, the RFID card will be read and thumb has to be scanned using biometric thumb scanner.
- If the user is valid then all the data related to the user (name, address, image, previous ration details, etc) will be shown.
- If the thumb is not matching, then error should be displayed
- The bank account of the user should be linked to a RFID card, whenever user buys ration the amount should be deducted from his bank account (not real time banking will be used, just a demo portal).
- After the transaction is complete the ration related detail (how much ration is left for this month, amount of purchase, date) has to be sent to the user in his/her mobile as SMS.
- The user's family member's detail can be added or deleted at ration card registration office.

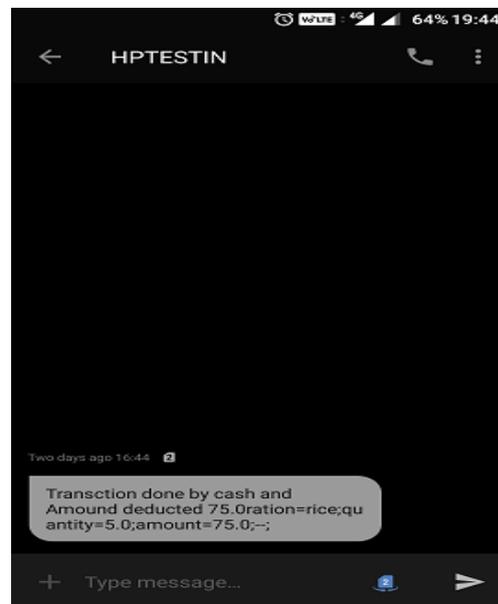
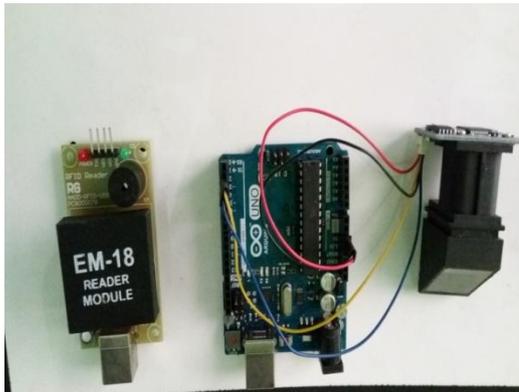


Fig 4. Hardware of Proposed System Fig 5. SMS received on registered user

4.2 USER CHARACTERISTICS:

Proposed system involves important role for the User.

There are four types of user to this system are :

1. District level admin
2. Taluka level admin
3. Ration card registration officer
4. Ration shop user

Each user having their specific tasks to interact with system. Users having smart ration cards having RFID tags, all information related to bank account and family members are added in Smart ration cards.

1. Firstly users have to register to the system at Ration card registration office.
2. Users have to interact with RFID readers to read RFID cards at Ration shop.

3. Users have to interact with Biometrics tool for thumb Scan at Ration shop.
4. User can see Bank transaction messages and Ration details on mobile.
5. Ration stock details will be seen in graphical format.

V. IMPLEMENTATION AND DISCUSSION

In this proposed system, we briefly discuss the existing works about Public Distribution System.

- In this automated system conventional ration card is replaced by RFID (smart card) in which all the details about users are provided including their bank details which is used for user authentication.
- It provides 2 Level Multi-Factor Authentication (RFID Smart Card and Biometrics).
- This proposed to use smart card instead of manual ration card with Biometrics for unique authentication

VI. FUTURE RESEARCH DIRECTION

The main aim of this paper is to provide the guidelines for further research related to emotion recognition. The outlines are given below:

- Train the system in such a manner that it determines the emotions in a more efficient and precise way with minimum error rate.
- Achieve 100% accuracy in predicting the emotions with the help of above approaches.
- Include new features like mood detection of person.
- Design a system which will work with both offline and online.

VII. CONCLUSION

The proposed system is more secure and transparent than the normal existing system. Influence of fraud data entry in the ration database can be maintained simply with the use of this smart ration card system. Only authorized person (shopkeeper) can maintain the database. Customer can be authenticated using RFID swapping and thumb detection. In the planned it is expected that the proposed system will be more transparent, reliable than the existing ration card system.

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