RFID and Biometrics Based Smart Ration Card System

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ABSTRACT

Nowadays, Ration card is very important for required and need homes. Generally ration card is used for family member details for gas connection and also ration card is act as an address proof etc. All the needed people who are having ration card can buy various material from the ration shop like (sugar, rice, oil, dals) in less rates that from other shops. But this ration card system faces two drawbacks:-first the shopkeeper who weighted the material can be inaccurate because of his mistake. Second is if the material is not buy at the end of the month they will send to others without permission of the government. To overcome this drawback we have proposed in this paper "Automatic Ration Card Using RFID and GSM". RFID is (Radio Frequency Identification) and GSM (Global System for Mobile) technology instead of ration card.

Keyword: - *Smart Ration Card System, Automation of Ration Shop, Web Enabled Ration Shop.*

1. INTRODUCTION

In this division, we present a concise introduction to Ration distributed system using Smart Card. Ration distribution an initiative by the Government of India under Ministry of Consumer Affairs, Food and Public Distribution intend for the distribution of commodities to destitute at fair price. In the projected system we introduce the RFID tags that hold a unique ID are issued to all the BPL card bearers. Here RFID tag (Smart Card) and the biometrics serves the purpose of authentication. Information and the fingerprint impression of the head of the family and one of the family members are cached in the centralized database whose access is only legitimized for a government authority. The first of the two authentication steps needs the beneficiary to swipe the Smart Card against RFID Reader installed at the FPS and the second step towards an authentication is that he/she should scan the fingerprint of his/her thumb against biometric. On matching his/her fingerprint with the id stored in the device, an appropriate fingerprint id interface with database to checks for valid beneficiary's information. Once authenticated, updated information is obtained by automated ration system concerning the existing subsidies for the beneficiary onto the main interface and the main interface also gives the information about the previous transaction made by the beneficiary. A beneficiary is permitted to take only those subsidies on products apportioned to him/her by government according to the available database inventory. After every transaction made by the beneficiary, centralized database is immediately updated and he/she will be sent a SMS (Short Message Service) specifying the quantity of commodity bought by him/her. With implementation of the projected system prime issues like bribery, uneven distribution and other difficulties faced by beneficiary can be terminated.

2. OBJECTIVE

Main objective of the propose system is to reduce forgery from ration shops and users will get their grocery in easy way. Also to reduce manual work. In the proposed system we will develop the smart ration card system based on the RFID and the BIOMETRICS, in which the user can fill their data online. And also the manual working is not there. When user wants a ration, he/she comes with the Smart ration card, then the card is swipe and check

whether the user is valid or not. The fingerprints of that user also check and the allocated ration is distribute to that particular user, changes of adding and issuing of ration is done automatically in the government database.

In the proposed system the card will swap and then the RFID will read the tag ad then for the valid user the finger prints will take and then check for the valid or the invalid user. If user is not valid then exit or the user not able to take the ration and if valid then the list of grocery will display on screen and then the distributor will distribute the grocery and then pay a money and then exit. Bank details are present on RFID, after swapping the card particular amount of grocery is deducted from account and message will be sent to user.

3. METHODOLOGY

Following are the modules used by the projected system

1. **Login Module:** In this module, the system registers beneficiaries details that includes their name, address, fingerprint, date of birth, age, contact number for sending SMS alerts, count of family members and category of the card to which the family belong, with all the information being uploaded in the database.

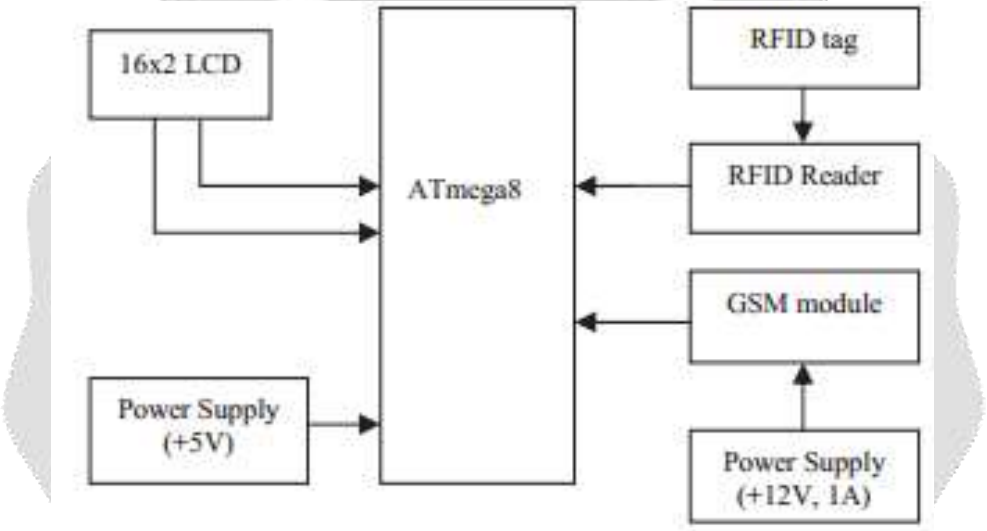

Fig -1: Block Diagram of Smart Ration Card

2. **RFID Card Verification Module:** RFID being a part of Automatic Identification and Data Capture (AIDC) technologies is considered to be a fast and reliable means of identifying objects. RFID based Smart Card verification module consists of two prime components, they are interrogator and transponder. The interrogator (RFID Reader) is needed to broadcast the signals through its antenna and the transponder (tag) will be activated after it receives the signals from the interrogator.

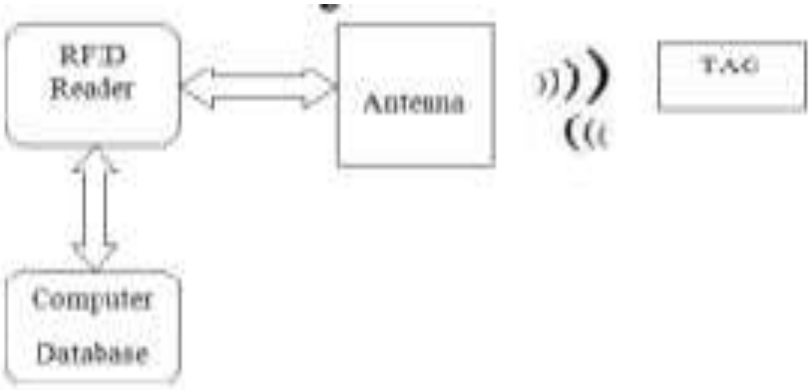

Fig -2: RFID Card Verification Module

3. **Biometric Verification Module:** The fingerprint scanning system has two processing steps. Firstly, it enrolls the fingerprint, where it gets an image of the thumb, and finally performs matching, later it determines if the pattern of ridges and valleys in the image are matched with the pattern of ridges and valleys in pre-scanned images.

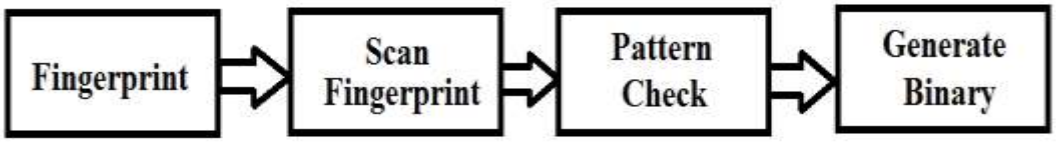

Fig -3: Biometrics Verification Module

4. **Purchase Module:** Once authenticated, the beneficiary has to select the list of commodity he/she wants to purchase. The system will display the total quantity of the commodities along with the information regarding previous transaction made by beneficiary. Once after he/she confirms the commodities, payment is done and beneficiaries are given a receipt in form of a SMS. A beneficiary is permitted to take only those subsidies on products apportioned to him/her by government according to the available database inventory.

5. **Alert Module:** A SMS gateway API serves the purpose of sending bulk messages to its users. here in this project it plays a role for intimating the beneficiary about the recent transaction made by him/her by sending him/her the message on his/her registered number.

6. **Stock Module:** The food department will send the stock to the respective distribution centers and also automatically update the stocks of the distribution center in the database. In this module the system maintains the details of incoming stock, distribution and remaining stock.

4. PRODUCT PERSPECTIVE

In this system, firstly we briefly studied the existing works about Public Distribution System, and to overcome problems related with existing system we are designing proposed system.

In this automated 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. This proposed 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.

5. 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 RF card will be given for identification)

Whenever the user will go to the shop for receiving the ration he has to give the RF card first, the RF card will be read and as password the thumb has to be scanned using biometric thumb scanner.

If the user is valid then all the data related to user (name, address, image, previous ration details, etc. will be shown). If the thumb is not matching, then proper error should be displayed. The bank account of the user should be linked to a RF card (RFID), 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 mobile as SMS. The user's family member's detail can be added or deleted at ration card registration office.

6. FUTURE WORK

1. For better understanding, an interface and website can be made available in different languages (regional languages).
2. For the ease of use, an application can be built for the same.
3. Kiosk can be developed for the beneficiaries to check the commodities available.
4. Automatic weighing system can be implemented at the FPS.

7. CONCLUSION

Ration forgery is one of the most difficult challenges faced by the food distribution department. There may be chances where ration is delivered to the beneficiaries and false records are noted down, regarding the delivery by commission agent. And there is probability of him (commission agent) selling the commodities in open market with extra profit etc. Therefore, the proposed system is more secure and transparent then the normal existing system. Entry of fallacious data in the ration database can be avoided with the use of smart cards and additional security is provided by the biometric authentication. The commission agent is only responsible for entering the quantity of the commodities, whereas updating and deducting is solely handled by the server (food department). Maintaining the database is also helpful for sending messages to the beneficiaries about the ration delivery. It is anticipated that the proposed project will create transparency in public distribution system as the work becomes automatic and also it makes the system free from irregularities.

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