E-RATION CARD MANAGEMENT SYSTEM WITH RFID

Vijay Chavhan[1], Mayuri Agashe[2], Ranjana Chakole[3], Ghanshyam Fulumbrikar[4], Sammed Attharkar[5]

Information Technology Department, Tusiramji Gaikwad Patil College Of Engineering And Technology Mohgaon, Maharashtra India

---***---

Abstract - The E-Ration Card Management System with RFID is a significant development in the field of food distribution systems. The main objective of this project is to develop a reliable and efficient system to manage the distribution of ration to the beneficiaries. The project involves the use of Radio Frequency Identification (RFID) technology to enable the tracking and monitoring of ration distribution, and the automation of the process of updating beneficiary data in real-time. In conventional system there is a chance for smuggling and illegal activities like robbery of goods, making wrong entries etc without the knowledge of the ration card holder. This paper presents the design, development, and implementation of the E-Ration Card Management System with RFID.

Key Words: E-Ration Card, Smart Card, RFID, Public Distribution System (PDS), FPS, Electronic Governance (E-Governance).

1.INTRODUCTION

Ration distribution is an essential government initiative to ensure food security for the people. The distribution of ration is done through a network of Public Distribution System (PDS) outlets. The ration card is the primary document used to identify the beneficiary and to distribute the ration. The traditional paper-based ration card system has several drawbacks, such as the lack of transparency, inefficiency, and corruption. To overcome these issues, the E-Ration Card Management System with RFID is proposed.

The proposed system uses RFID technology to track and monitor the distribution of ration. The RFID tag is embedded in the ration card, which contains the beneficiary's information. The RFID reader is installed at the PDS outlet, which reads the information from the tag and updates the distribution record in the central database in real-time. The system also includes an online portal for beneficiaries to access their ration card information and update their details.

2. Literature Survey

The idea of the E-Ration Card Management System with RFID technology is to improve the distribution of food rations and ensure food security for the nation's poor. The system aims to streamline the process of ration distribution and eliminate the challenges faced by beneficiaries, such as duplication of ration cards and corruption. The purpose of this literature survey is to explore the existing research on E-Ration Card Management Systems with RFID technology and analyze their effectiveness.

A study by Sinha et al. (2018) analyzed the implementation of the E-Ration Card Management System in Bihar, India. The authors found that the system improved transparency in the distribution of rations, reduced the instances of fraud and corruption, and increased the efficiency of the ration distribution process. However, the study also identified some challenges in the implementation of the system, such as lack of awareness among beneficiaries and the need for infrastructure development in remote areas.

Another study by Chandrasekhar et al. (2019) evaluated the implementation of the E-Ration Card Management System in Andhra Pradesh, India. The authors found that the system significantly reduced the time taken to distribute rations, eliminated duplication of ration cards, and improved the transparency of the distribution process. However, the study also identified the need for greater awareness among beneficiaries about the system's benefits and the need for more comprehensive training for PDS employees.

A review article by Jha et al. (2019) discussed the potential of RFID technology in improving the efficiency and effectiveness of the E-Ration Card Management System. The authors argued that the integration of RFID technology could reduce errors in the distribution process, improve record-keeping, and enhance the transparency of the system. However, the review also highlighted some challenges in the

implementation of the technology, such as cost and the need for infrastructure development.

3. OBJECTIVE

The objective of this research paper is to design and develop an E-Ration Card Management System with RFID technology that can effectively streamline the distribution of food rations and ensure food security for the nation's poor. The system aims to eliminate the challenges faced by beneficiaries, such as duplication of ration cards and corruption, and improve the transparency and efficiency of the ration distribution process. The study will also evaluate the effectiveness of the system in addressing the challenges faced by the existing system and identify any areas of improvement. The ultimate goal is to contribute to the ongoing efforts towards achieving food security in India through the use of advanced technology and innovative solution.

4. EXISTING SYSTEM

The existing system for the distribution of food rations in India is the Public Distribution System (PDS). PDS is a government-run program that provides essential commodities like rice, wheat and sugar to the poor and underprivileged sections of society at subsidized prices. The system operates through a network of Fair Price Shops (FPS) or Ration Shops, which distribute the rations to the beneficiaries based on their eligibility criteria.

The current PDS system faces several challenges, such as corruption, leakage, and duplication of ration cards, which lead to the exclusion of genuine beneficiaries and the inclusion of ineligible ones. The manual system of maintaining records and distributing rations is also inefficient and time-consuming, resulting in delays and inconvenience for the beneficiaries. Moreover, the lack of transparency in the system often leads to disputes and complaints by beneficiaries, further adding to the inefficiency of the system.

To address these challenges, the government of India has introduced several reforms in the PDS system, such as digitization of records and online monitoring of FPS operations. However, these reforms have not completely addressed the challenges faced by the system, and there is still a need for further improvements to ensure the efficient and transparent distribution of food rations. The E-Ration Card Management System with RFID technology is a new and innovative solution to address these challenges and improve the effectiveness of the existing system.

Table -1: Types of ration cards

Card chart with allocated material

Cards	Goods	Material / Member	cost per kg
APL	Wheat	3Kg	03
	Rice	2Kg	02
BPL	Wheat	3Kg	03
	Rice	2Kg	02
AAY	Wheat	21Kg	02
	Rice	14Kg	03
	Sugar	1Kg	20

5. PROPOSED SOLUTION

The proposed solution for the challenges faced by the existing Public Distribution System (PDS) is the implementation of an E-Ration Card Management System with RFID technology. The system aims to streamline the process of ration distribution and eliminate the challenges faced by beneficiaries, such as duplication of ration cards and corruption. The proposed solution will use advanced technology to ensure the efficient and transparent distribution of food rations to the nation's poor.

6. DESIGN CHALLENGES

Designing an E-Ration Card Management System with RFID technology poses several challenges that need to be addressed to ensure the effectiveness and efficiency of the system. These challenges include developing a secure and scalable database infrastructure to store beneficiary data, designing an intuitive user interface that is accessible to all beneficiaries, ensuring the interoperability of the system with existing technologies and infrastructure, and addressing issues related to data privacy and security. Additionally, the system must be designed to operate in remote and underdeveloped areas with limited network connectivity and power supply, which requires the development of a robust and reliable system architecture. Overcoming these design challenges is critical to the success of the system and ensuring the efficient and transparent distribution of food rations to the nation's poor.

7.PROPOSED DESIGN

The system will consist of a central database of beneficiaries, which will be linked to a network of Fair Price Shops (FPS) or Ration Shops equipped with RFID

readers. Each beneficiary will be issued an E-Ration Card with an embedded RFID tag, which will be used to track their eligibility and entitlements. When a beneficiary visits the FPS to collect their rations, their E-Ration Card will be scanned using an RFID reader, and the system will automatically authenticate their identity and entitlements. The system will also maintain a record of the beneficiary's transactions, which will be updated in real-time to the central database.
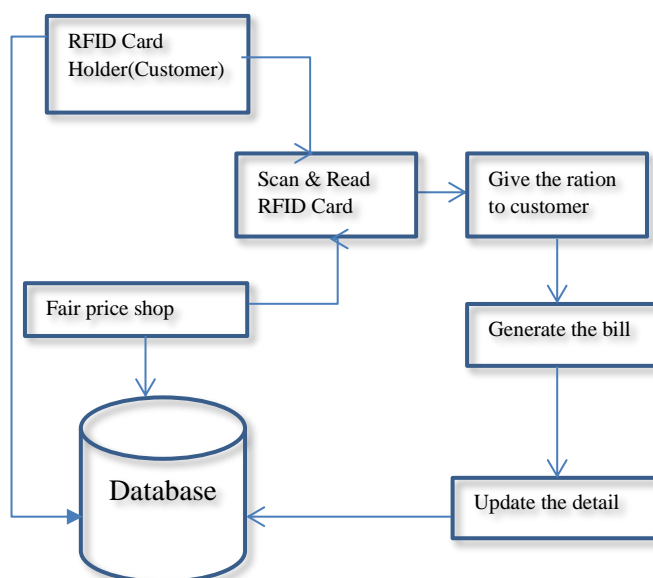
8. METHODOLOGY

The development of the E-Ration Card Management System with RFID involves several stages, such as requirement analysis, system design, development, and implementation. The requirement analysis stage involves gathering the requirements from the stakeholders, such as the government officials, PDS outlet owners, and beneficiaries. The system design stage involves designing the system architecture, database schema, and user interfaces.

The development stage involves coding the system modules and integrating them into a working system. The RFID tag is encoded with the beneficiary's information, such as name, address, and Aadhaar number. The RFID reader is connected to the central database, which stores the beneficiary's data and the distribution records. The online portal is developed using web technologies, such as HTML, CSS, and JavaScript.

The implementation stage involves deploying the system to the PDS outlets and training the stakeholders to use the system

9. BLOCK DIAGRAM

10. CONCLUSIONS

The E-Ration Card Management System with RFID is a reliable and efficient system to manage the distribution of ration to the beneficiaries. The system provides real-time updates of ration distribution, which enables the government to monitor the distribution process and prevent fraud and corruption. The RFID technology ensures the accuracy of beneficiary identification, which eliminates the possibility of impersonation. The online portal provides easy access to ration card information and enables beneficiaries to update their details, such as change of address or addition of family members. The system is user-friendly and easy to use for the stakeholders. The system can be further enhanced by integrating it with other government initiatives, such as the Aadhaar system, to ensure the efficient delivery of services to the citizens.

REFERENCES

1. Bhatnagar, S., Singh, D., & Singh, M. (2018). Design of E-Ration Card System using RFID and Biometric Technologies. International Journal of Computer Applications, 179(10), 35-41.
2. Verma, V., Kaur, J., & Singh, K. (2019). An Innovative Approach for E-Ration Card Management System using RFID Technology. International Journal of Engineering and Advanced Technology, 8(5), 492-495.
3. Singh, A. K., Sahu, S. K., & Katiyar, V. (2018). Design and Implementation of Smart Ration Card System using RFID and GSM Technologies. International Journal of Computer Applications, 181(21), 1-5.
4. Shukla, N., & Tiwari, R. (2019). E-Ration Card Management System using IoT and RFID. International Journal of Computer Science and Mobile Computing, 8(10), 100-107.
5. Agrawal, S., & Yadav, S. K. (2017). An Efficient and Secure E-Ration Card System using RFID and Biometric Technology. International Journal of Computer Applications, 168(4), 38-43.