# E-Ration With QR Code Security

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***Abstract-*** *The E-ration system with QR code security presents a modern approach to manage and distribute rations electronically, ensuring both efficiency and security. This paper explores the integration of unique QR codes, generated for each registered individual, containing encrypted personal and allocation details. Distribution and redemption occur through secure scanning at designated points, with additional authentication layers like biometrics or OTPs. The system aims to streamline the distribution process, enhance transparency, and reduce fraudulent activities, despite challenges like infrastructure requirements and potential security risks.*

***Keywords:*** *E-ration, QR code security, ration distribution, encryption, authentication, transparency, fraud prevention.*

## I. INTRODUCTION

The Public Distribution System (PDS) is India's food security system. It is established by the Government of India under the Ministry of Consumer Affairs, Food and Public Marketing and is administered jointly with the State Governments of India.Traditional PDS is used to distribute daily commodities to poor people in India who have valid food allowance. State authorities control the validity and distribution of ration cards. The ration card holder should get 35 kg offoodstuffs as per PDS norms. However, there are concerns about the effectiveness of the distribution process. To improve this and improve the existing PDS system we are introducing e-Ration Shop with biometric device [1]

Here we use biometric device for shopping. With the card holder of this device, you can take out your groceries from FPS. The main reason for using this biometric device and computerizing the process is to remove the shortcomings of the current ration card based method of issuing products. A major drawback of the current system is that the PDS has been criticized for its urban bias and inability to effectively serve the poorer population [2]

Targeted PDS is expensive and leads to corruption freeing the poor from the less poor. Also, many retailers have many fake cards to sell food in the strong market. Many FPS traders resort to malpractices because they get less payments. In most cases, users do not receive their legal rights in quantity. Agricultural products destined for them or obtained by FPS are directed to the free market. So to avoid all these hassles ni uses e-Ration shop with biometric device [3]

The country's Public Distribution System (PDS) facilitates the supply of food to the poor at subsidizedprices. However, doubts have been raised about the effectiveness and cost-effectiveness of the PDS, especially in light of increasing food aid and food supplies. PDS must berestructured and explore innovative ideas like smart cards,creditdebit cards, food vouchers and decentralized purchasing torelieve hunger and provide food to thepoor wherever they are. in an efficient manner.To prevent corruption and encourage the development of small and medium-sized businesses [4]

The United Nations Industrial Development Organization (UNIDO) and the United Nations Office on Drugs and Crime (UNODC) joined forces to conduct this study to examine the nature and extent of the problem. This report is based on industry-specific assessments and an expert meeting where obstacles to the development of SMEs caused by public and private sector corruption were discussed.The website allows us to remotely track the inflow of kerosene and vehicles delivering kerosene and ration material until it reaches the warehouses, as well as distribution to local residents is done centrally through a record web program. username andpassword for each person who has a solenoid valve, Hooper valve control feed outlets, etc [5]

## II.LITERATURE SURVEY

According to **Swapnil R, et al., 2016,** Today many unethical activities are done in grocery stores to distribute goods below the poverty line because the distribution process is manual and therefore takes a lot of time. We can use RFID technology to solve this problem. This article introduces RFID tags, RFID cards are an alternative to ration cards that contain all cardholder information such as family details, card type and validity, etc. In this article, we discuss the different types of automatic food rationing systems that have been implemented. for automatic portioning(6)..

**Mahammad Shafi, et al., 2017,** Says that Government of India has established Fair Price Shops (FPS) under the Public Distribution System (PDS) to ensure fair food supply to all citizens of India. Essential commodities like rice, wheat, sugar, kerosene etc. are delivered to the disadvantaged target groups as per the terms and schedule set by the Government of

India. Despite the efforts of government officials at different levels, there are bottlenecks and gaps in the use of services offered to target citizens. the aim of identifying opportunities for further research. Computerization can contribute to the modernization of PDS FPS(7).

According to **Lucie Gadenne 2020**, In many developing countries, households can purchase limited quantities of goods at fixed subsidized prices through ration shops. This article asks whether the characteristics of developing countries explain why governments use such systems. I find an equality-efficiency trade-off: an efficiency-maximizing government never rations food, but a welfare-maximizing government can redistribute and provide insurance. The increase in the welfare of ration shops is the largest in the case of essential goods and goods with high price risk(8)..

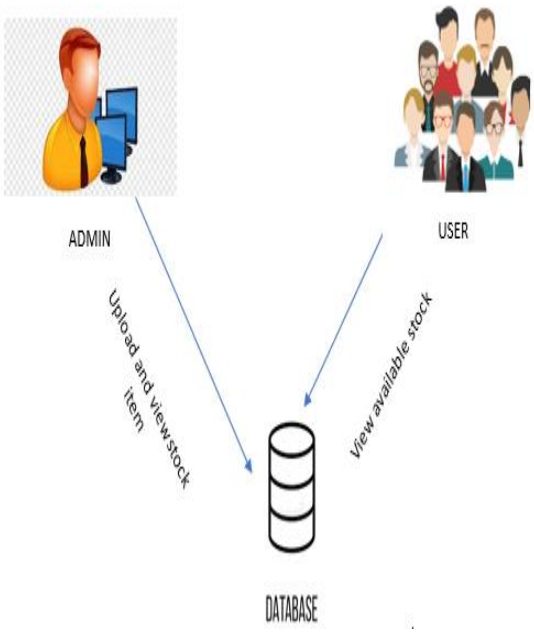
According to **D Malathi, et al., 2022,** The current manual data management and ledger management causes a lot of corruption in the process of allocation of poor and less poor. The blockchain market has opportunities due to the current data management methodology. This paper proposes a smart share trading system based on blockchain technology, which uses immutable transactions based on smart contracts to solve problems. The proposed mechanism increases transparency and allows everyone access to all events. The system uses IoT technology to track assets as food is moved from distribution centers to a specific ration shop(9)...

**S. Sathya, et al., 2023,** The government provides various occupations to the population below the poverty line, but such occupations do not reach the poor because of the chain of degradation. public transport is the most famous in the public arena. For the Ration Material Distribution System (RMDS), the parliament has given different cards to the customers, which shows their scarcity. In such a framework, customers can buy proportionally(10)

## III.PROPOSED SYSTEM

The proposed e-ration system integrates a secure QR code mechanism to streamline and safeguard the distribution of rations. Upon registration, individuals receive a unique QR code linked to their personal and ration details, ensuring one-time registration and allocation accuracy. At distribution points, this QR code is scanned to authenticate the individual and dispense the allocated ration. Advanced encryption and authentication methods fortify the system against unauthorized access and fraud. Real-time monitoring further ensures transparency and accountability in ration distribution, promising an efficient, transparent, and secure approach to welfare provisioning.

## ARCHITECTURE DIAGRAM




The architecture of the E-Ration System with QR Code Security is designed to be robust, secure, and scalable, ensuring efficient distribution and management of rations while maintaining the integrity of the system.

**1. User Interface (UI) Layer:**The User Interface layer represents the front-end components accessible to end-users, including registration portals, digital wallets, and QR code generation interfaces.Users interact with the system through intuitive and user-friendly interfaces, facilitating easy registration, ration allocation, and QR code retrieval.

**2. Application Layer:**The Application Layer serves as the core processing unit of the system, handling business logic, data validation, and communication between different system components.It includes modules for user registration, ration allocation, QR code generation, and distribution management.

**3. Security Layer:**The Security Layer is integrated throughout the architecture to safeguard sensitive data and prevent unauthorized access, tampering, or fraud.It incorporates encryption techniques, authentication mechanisms, and secure communication protocols to ensure data integrity and confidentiality.

**4. Database Layer:**The Database Layer stores all the essential data, including user profiles, ration allocation details, and transaction logs.It utilizes a secure and scalable database system capable of handling large volumes of data efficiently and reliably.

**5. Distribution Points/Redemption Centers**:Distribution Points or Redemption Centers represent the physical locations where individuals can redeem their allocated rations by presenting their QR codes.These centers are equipped with

secure QR code scanners connected to the central system for real-time verification and validation of QR codes.

**6. Centralized Management and Monitoring System:**The Centralized Management and Monitoring System provides administrators and authorities with a centralized platform to manage, monitor, and control the entire E-Ration System.It offers real-time insights, reporting tools, and alert mechanisms to identify and address any discrepancies, irregularities, or security threats promptly**.**

## IV.RESULTS AND DISCUSSION


**FIGURE.1 Home Page**

Welcome to our E-Ration Distribution System! Experience seamless and secure ration distribution with our innovative QR code technology. Our platform prioritizes efficiency, transparency, and accessibility to ensure that eligible individuals receive their entitlements timely and securely. Join us in revolutionizing ration distribution for a better tomorrow.

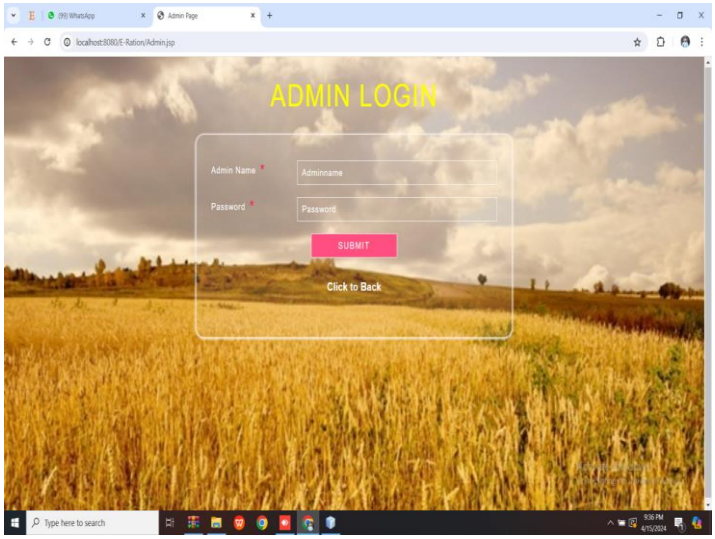



**FIGURE.2 Admin Login**

Gain exclusive access to our comprehensive admin dashboard designed to streamline and manage the E-Ration Distribution System effectively. With robust security features, real-time monitoring, and intuitive controls, administrators can oversee user registrations, stock inventory, distribution activities, and more with ease. Empower your organization with the tools to enhance accountability, transparency, and operational efficiency.

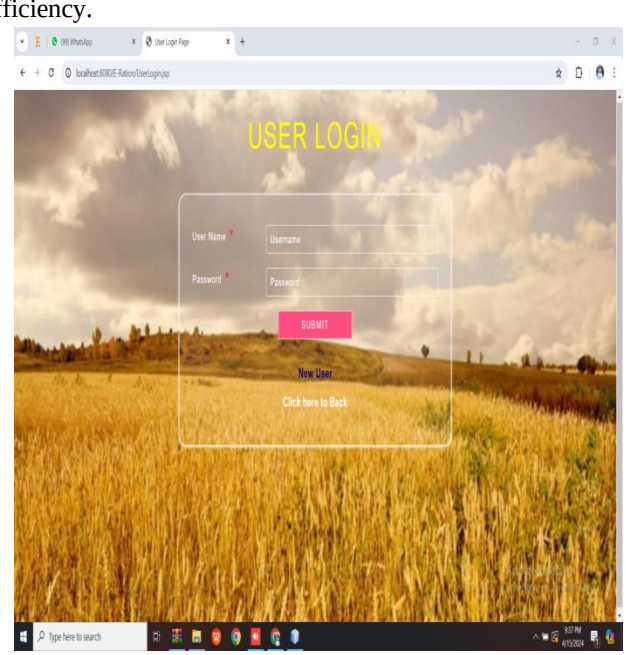



**FIGURE.3User Login**

Access your personalized user dashboard to manage your ration entitlements conveniently. Our user-friendly interface allows you to view your allocated rations, transaction history, update personal details, and more. Experience hassle-free ration distribution with quick verification using your unique QR code. Stay informed and empowered with our secure and transparent E-Ration Distribution System.

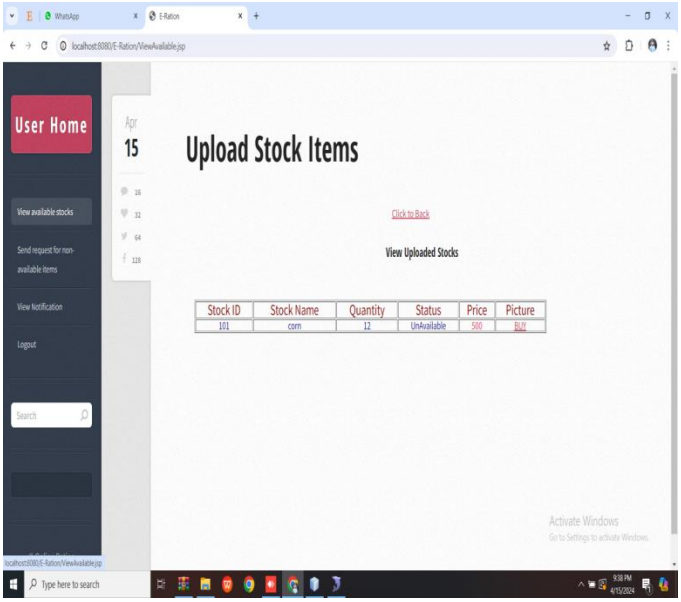



**FIGURE.4 Upload Stock Items**

Simplify stock management with our user-friendly stock upload feature. Easily upload and update stock items, quantities, expiry dates, and other essential details through our intuitive interface. Ensure accurate and timely distribution by maintaining an up-to-date inventory. Our platform's seamless integration with the E-Ration Distribution System enables efficient tracking and management of stock items, enhancing overall operational efficiency.

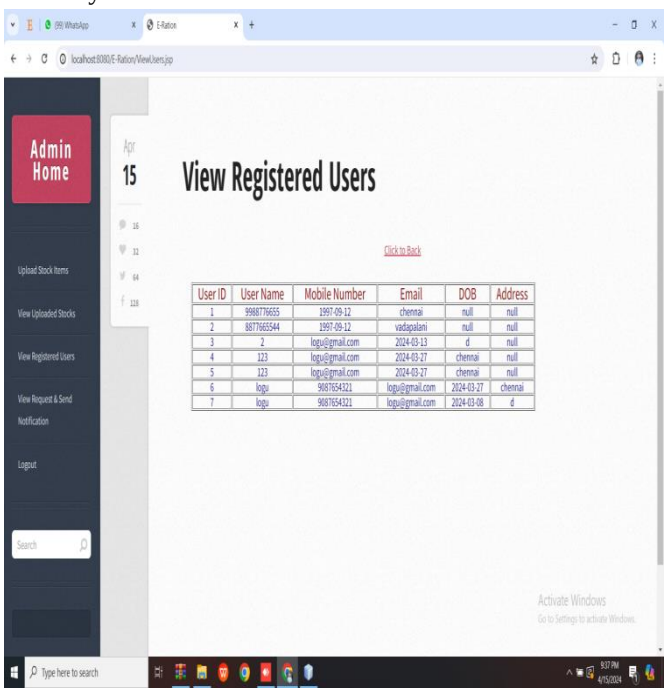



**FIGURE.5 View Registered Users**

Effortlessly manage and monitor registered users with our comprehensive user management tool. Access detailed user profiles, including personal details, ration entitlements, and transaction history, to ensure accurate and transparent distribution. Utilize advanced search and filter options to quickly identify specific user groups or demographics. Empower administrators with valuable insights and analytics to optimize ration distribution strategies and improve user engagement.

## V.CONCLUSION

The proposed E-ration system with QR code security offers a promising solution to the challenges faced in traditional ration distribution systems. By leveraging modern technology, such as QR codes and encryption, the system aims to improve efficiency, transparency, and security. While infrastructure requirements and potential security risks pose challenges, proper planning, implementation, and monitoring can mitigate these issues. With its potential to revolutionize the distribution of rations, this system warrants further exploration and pilot testing to validate its effectiveness and scalability.

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