

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Smart And Secure Public Distribution System Transportation

Karthica N¹, Surya M², Stalin K³, Thupakula Ganesh⁴

Assistant Professor ¹, Student ², Student ³, Student ⁴

Department of Computer Science and Engineering ,Paavai Engineering College, Pachal ,Namakkal, Tamil Nadu ,India

ABSTRACT :

The Public Distribution System (PDS) is a vital food security program in India, aimed at providing essential commodities to the economically weaker sections of society. However, traditional transportation mechanisms under the PDS often face challenges such as pilferage, diversion, delays, and lack of transparency. This project proposes a Smart and Secure Public Distribution System Transportation model that integrates GPS tracking, geofencing, mobile applications, and centralized monitoring to ensure secure, transparent, and efficient movement of goods. The proposed system aims to reduce leakage, improve delivery accuracy, and enhance accountability throughout the supply chain. A new addition includes stock provide peoples to calculate family based, add user interface in allowing members to monitor and update household inventory.

Keywords: Smart PDS, GPS tracking, Geofencing, Supply Chain Management, RFID, Public Distribution, Secure Transportation, E-Governance, Realtime Monitoring, Automation.

I.INTRODUCTION :

The Public Distribution System (PDS) is the backbone of food security in India, distributing subsidized food grains and other essential commodities to millions. Despite its importance, the system suffers from issues like corruption, delays, and inefficiencies in transportation. Manual tracking and verification often lead to leakage and misuse. With the increasing availability of digital technology, it is now possible to design and implement a smart and secure transportation system that addresses these challenges. This document explores a smart model that ensures the timely and secure delivery of goods from storage centers to Fair Price Shops (FPS), thereby improving the overall efficiency and transparency of the PDS. With secure access, seamless integration with sales and accounting platforms, and insightful reporting, SMS boosts efficiency, reduces waste, and ensures products are always available—making everyday stock management easier and smarter.

II.PROPOSED SYSTEM :

The proposed Smart and Secure Public Distribution System Transportation model leverages modern technologies such as GPS tracking, geofencing, RFID/QR code tagging, and mobile applications to ensure a transparent and tamper-proof supply chain. Each transport vehicle will be equipped with GPS devices to enable real-time tracking, while geofencing ensures that the vehicle remains within a predefined route. RFID or QR codes will be attached to each consignment for easy scanning and verification at various checkpoints. A centralized control system will monitor all vehicle movements, generate alerts for route deviations or delays, and allow authorities to intervene in real time. Additionally, mobile applications will be provided to drivers and FPS owners to receive notifications, confirm deliveries, and report issues. This integrated approach not only minimizes pilferage and corruption but also ensures timely delivery of essential commodities to the intended beneficiaries. The system also performs monthly stock usage calculations, identifies completed and remaining items, and auto-assigns inventory for the following month. The proposed Stock Management System (SMS) is a smart, user-friendly platform designed to efficiently manage inventory for both businesses and families. With real-time updates, secure access, and insightful reports, the proposed system aims to reduce waste, improve planning, and streamline overall inventory management.



III. MODULES:

USER AUTHENTICATION MODULE

- The User Authentication Module ensures that only authorized personnel can access the system.
- It provides secure login functionality using credentials such as usernames, passwords, and optionally two-factor authentication.
- Different user roles—like administrators, drivers, and FPS dealers—are assigned appropriate access rights.
- This module is crucial for maintaining data security and preventing unauthorized manipulation of sensitive information related to PDS transportation.
- The module maintains logs of user activities, such as login times and actions performed, which enhances accountability and helps detect any unauthorized behaviour.

USER INTERFACE MODULE

- The User Interface (UI) Module serves as the interactive layer between users and the system.
- Designed with simplicity and usability in mind, it allows users to easily navigate through features such as tracking, inventory status, alerts, and reporting tools.
- The interface is tailored to suit different roles, offering intuitive dashboards for administrators, route views for drivers, and delivery confirmations for FPS dealers.
- The interface displays real-time system alerts like route deviations, delayed deliveries, or low stock warnings, helping users respond promptly to issues.

INVENTORY MANAGEMENT MODULE

- The Inventory Management Module monitors the stock levels of essential commodities within warehouses and at FPS outlets.
- It tracks the movement of goods, updates inventory records after each dispatch or delivery, and helps prevent stock shortages or surpluses.
- This module ensures that the right quantity of goods is dispatched, minimizes wastage, and aids in generating timely reports for restocking.
- Efficient inventory management contributes to a more reliable and transparent distribution system.

IV. RESULT



V. FUTURE ENHANCEMENT:

In the future, the Smart and Secure Public Distribution System Transportation model can be enhanced with advanced technologies to further optimize efficiency and security. Integration with **Aadhaar and e-Pos systems** will allow for end-to-end beneficiary verification and seamless record-keeping. **AI and machine learning** can be employed for predictive route optimization, vehicle maintenance alerts, and demand forecasting. Additionally, **blockchain technology** can be introduced to create tamper-proof records of goods movement, ensuring full transparency and traceability. The system can also incorporate **IoT sensors** for real-time vehicle health monitoring and temperature control for perishable goods. These enhancements will make the system more robust, scalable, and capable of meeting the growing demands of public food distribution with greater accuracy and accountability.

VI.CONCLUSION:

The implementation of a Smart and Secure PDS Transportation system can revolutionize the delivery mechanisms of public goods in India. By integrating real-time tracking, automation, and centralized control, this model addresses the long-standing issues of corruption, delay, and inefficiency in PDS transportation. This technological intervention not only enhances accountability but also ensures that food and essentials reach the intended beneficiaries promptly and securely, thereby strengthening the impact of one of India's most critical welfare programs.

VII.REFERENCE:

J. P. N. Jasmitha, S. Prashanth, D. Anish, and M. J., "Design and Evaluation of a Real-Time Stock Inventory Management System," in *Proc. 2023 IEEE 5th Int. Conf. Cybern., Cognition Mach. Learn. Appl. (ICCCMLA)*, Goa, India, 2023, pp. 251–255. doi: 10.1109/ICCCMLA58983.2023.10346665.
S. Maitra, "A System-Dynamic Based Simulation and Bayesian Optimization for Inventory Management," *arXiv preprint*, arXiv:2402.10975, 2024. [Online]. Available: https://arxiv.org/abs/2402.10975

[3] Y. Mashayekhy, A. Babaei, X.-M. Yuan, and A. Xue, "Impact of Internet of Things (IoT) on Inventory Management: A Literature Survey," *Logistics*, vol. 6, no. 2, pp. 1–20, Jun. 2022. doi: 10.3390/logistics6020033.

[4] S. S. Tushan, A. M. Rahman, M. I. Hossain, M. F. Hossain, and M. H. Pavel, "Development of IoT Based Low-Cost Smart Inventory Management System," in *Proc. 5th Int. Conf. Ind. Mech. Eng. Oper. Manag. (IMEOM)*, Dhaka, Bangladesh, Dec. 2022. [Online]. Available: https://index.ieomsociety.org/index.cfm/article/view/ID/13339.

[5] A. K. Pinagapani, S. S. Latha, and M. S. Rao, "Automated Material Handling for Inventory Management System," *Acta IMEKO*, vol. 13, no. 4, pp. 123–129, 2024. doi: 10.21014/actaimeko.v13i4.1728.