

Smart PDS in India: Digital Governance for Efficiency, Transparency and Empowerment

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Abstract

The SMART PDS project has revolutionized the Public Distribution System (PDS) in India by enhancing efficiency, transparency, and customer empowerment. This study looks at the digital reforms that were implemented between 2024 and 2026, such as the One Nation One Ration Card (ONORC) program, electronic point-of-sale (e-POS) implementation, and Aadhaar authentication. Secondary data from government publications and policy briefs were analysed by a hybrid qualitative- quantitative approach to assess the operational results. A total of 20.4 crore ration cards has been digitized, 99.8% beneficiaries have been seeded with Aadhaar till so far, 5.33 lakh e-POS devices have been set up, 5.8 crore duplicate cards have been removed and daily transactions in Assam have surpassed 35 lakhs. By integrating with PM Gati Shakti, the economic and environmental benefits of digital supply chains were accentuated with a savings of RS 112 crore per year. However, problems of digital, infrastructure and harmonization at the state level remain. The study concludes that SMART PDS can be viewed as a technological innovation and a governance innovation, and is relevant to other welfare distributions system globally.

Keywords: SMART PDS; Aadhaar Authentications; e-POS Devices; One Nation One Ration Card (ONORC); Digital Governance; Welfare Delivery; Public Distribution System; Transparency; Consumer Empowerment; Policy Innovation

Introduction

Context of PDS in India

The Public Distribution System (PDS) is traditionally the bedrock of food security in India, ensuring vulnerable households have affordable access to food and other essentials. The system, which was created in the middle of the 20th century, has grown to be one of the biggest benefit distribution networks in the world, serving around 800 million recipients. Even though PDS is large in size, it has faced problems such as leakages, inefficiencies and exclusion errors which have made it difficult to effectively reach the target population.

Need for Digital Transformation in Welfare Delivery

Digital governance has added new possibilities for the improvement of welfare delivery system. Implementing Aadhaar enabled Electronic Point-of-sale (e-POS) devices and the 'One Nation One

Ration Card' (ONORC) schemes at the PDS aims towards greater transparency, reducing duplication and ensuring portability benefits for the beneficiaries. The changes reflect a paradigm shift in welfare governance and are aligned with bigger initiatives in the country under the Digital India umbrella. They transcend just technological innovations. While the integration of ICT has proved beneficial, in terms of increased productivity, accountability and customer satisfaction. It has also raised new concerns regarding digital literacy, infrastructural preparedness and inclusivity.

Review of Literature

Radhakrishna 2005 A key component of India's framework for food security, the Public Distribution System (PDS) has been thoroughly researched. In the first study, food grain diversion, ghost beneficiaries and geographical disparities in access to food grains were brought to the fore as systemic inefficiencies. The necessity of structural changes to enhance targeting and lower leakages was brought to light by later research.

Drèze & Khera 2017 Since the advent of the digital government, scholars have been exploring the potential of technology to enhance welfare delivery. Worries were raised about exclusion errors, but studies on Aadhaar integration demonstrated to addressing exclusion errors and preventing duplicate ration cards. Studies conducted on e-POS devices have found an increase in transparency and accountability, particularly in states such as Andhra Pradesh and Chhattisgarh.

NIC Report 2025 has been conducted on Smart PDS, a strategy that integrates, Aadhaar seeding, e-POS devices and real time monitoring and creates a scalable and robust distribution strategy.

Gupta 2022 The "One Nation One Ration Card" (ONORC) scheme for migratory laborers to get ration supplies from state to state has been sound as a significant stride towards mobility. Research indicates that ONORC has enhanced customer satisfaction and destroyed geographic disparities.

Objective of the study

The present study aims to analyze the digital transformation of India's Public Distribution System (PDS) through the SMART PDS initiatives. The specific objectives are:

- To assess the efficiencies gained from digitization of ration cards, Aadhar seeding and e-POS authentication.
- To evaluate the enhancement of transparency and accountability in the food grain distribution system, including leakages and elimination of duplicate beneficiaries.
- To study consumer empowerment through portability in scheme of "One Nation One Ration Card" (ONORC).
- To understand the problems that arise and to suggest future direction for improving the delivery of welfare, such as infrastructure, digital literacy and the use of new technologies

Conceptual Framework

The Public Distribution System (PDS) is the subject of this study's conceptual framework, which is based on the ideas of digital governance and welfare delivery efficiency. It is an integration of four key dimensions that support the study's objectives

Efficiency Gains

This is based on the operational efficiency theory and examines the impact of digitization of ration card, Aadhaar seeding and e-PoS authentication on the ease of procedures, speed of transactions and reduction of administrative burden

Under the framework, digital tools help provide benefits that are resilient and scalable.

Transparency and Accountability

This module based on the governance and accountability paradigms, focuses on the ability of biometric authentication, real time monitoring and avoiding duplicate beneficiaries to strengthen system confidence

Transparency is seen as a governance consequence as well as a technological outcome

Consumer Empowerment

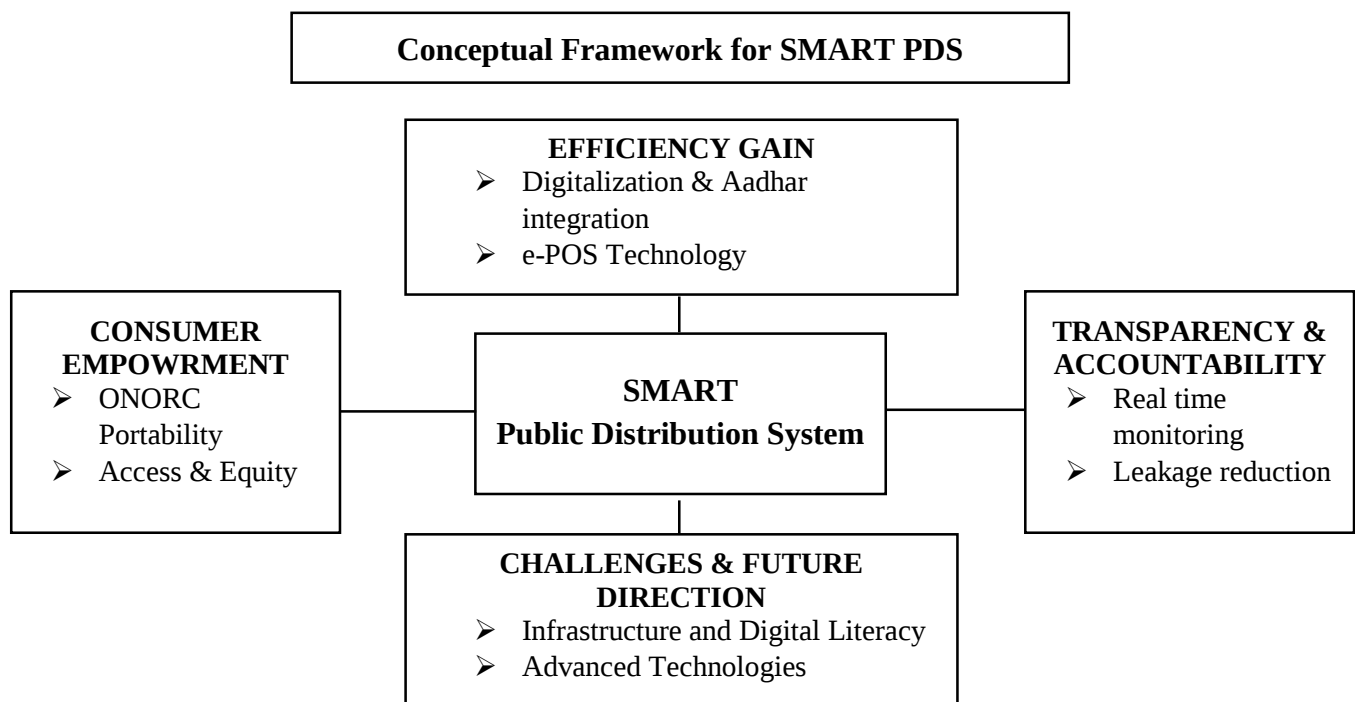
This dimension which is rooted in the welfare economics and rights-based approaches, focuses on the mobility of entitlements under ONORC

According to the paradigm, empowerment is the ability of recipients especially migrant workers to easily obtain rations across states, which lessens inequality and exclusion

Challenges and Future Directions

This dimension acknowledges several challenges, including poor eKYC lack of digital literacy, and infrastructure issues. It is based on principles of digital inclusion and sustainability

It also incorporates innovative strategies such as cybersecurity, cloud-based monitoring, and AI integration to ensure sustainability of digital welfare systems.



The conceptual framework of the SMART PDS model illustrates the relationship among the three elements of efficiency, transparency, consumer empowerment and sustainability. The digitalization of ration cards and authentication using Aadhaar have given a boost to efficiency and accountability, and the implementation of e-POS and portability of ONORC have strengthened consumer rights and transparency. The framework also highlights the importance of logistics as an enabler for the PM Gati Shakti and the potential savings and environmental benefits that can be achieved through it. All of these elements illustrate how the various aspects of digital governance interact to reimagine welfare delivery in accordance with the study's objectives of improving operational performance, reducing leakages, and enabling beneficiaries

Key achievements

Key Achievements milestone in India's journey towards digitizing welfare was the launch of the SMART Public Distribution system (PDS) in 2025. About 80.6 core beneficiaries in 29 states were covered by the initiative's successful digitization of 20.4 core ration cards. Aadhaar linkage was used to confirm nearly 99.8% of ration cards and 98.7% of ration card holders, ensuring accurate targeting of ration cards and eliminating duplicate data.

5.33 lakh electronic point-of-sale (e-POS) devices have been installed to provide real time biometric verification at Fair Price Shops, enhancing accountability and transparency. The platform has already demonstrated its scalability and robustness, as it processed 35 lakh e-POS transaction in Assam on a single day. In addition, 5.8 crore ineligible ration cards were also withdrawn as part of the project, which not only reduced leakage but also enhanced financial efficiency.

The One Nation One Ration Card (ONORC) programme, gave an tremendous empowerment to the beneficiaries, particularly the migrant workers. Carbon emission reduction facilitated by integration with PM Gati Shakti platform enhanced in the improvement of supply chain management and logistics, thereby saving more that Rs. 112 crores every year and assuring environmental sustainability.

Taking everything into account, SMART PDS is truly an exemplary model of digital governance that can transform the delivery of welfare at the population level by combining inclusiveness, efficiency and openness.

Challenges and limitation

Smart PDS has made great strides, but there are still a number of obstacles to overcome. Firstly, because of lack of infrastructure in rural or remote location, e-POS devices are not always as effective as they could be, particularly where they are unable to undertake real-time authentication due to network delays. Second, some beneficiaries are still out of reach due to lack of e-KYC coverage, particularly those who don't have Aadhaar linking and those who have biometric anomalies. Third, many beneficiaries are challenges with completing authentication process and digital literacy is a barrier to adoption among disadvantage population. Fourth, State-to-State administrative difference results in inconsistent implementation, reducing uniformity of service delivery. Finally, empirical validation is limited to secondary data, highlighting the need for primary field-based studies to reflect the real ground level, which are not covered in this book.

Policy Implication and Recommendations

There are important policy ramifications for India's welfare governance from the SMART PDS initiative. The system ensures equitable access to foodgrains with a reduced leakage and inefficiencies in use of digital reforms in coordination with the NFSA goals. PDS has become a model of accountability thanks to the use of Aadhar verification and real-time monitoring, establishing a standard for other social programs. Also, ONORC helps to ensure portability of benefits and thus social inclusion, particularly for migrants. Finally, the collaboration of logistics in the PM Gati Shakti portal demonstrates the potential of digital supply chains to generate environmental sustainability and economic efficiency which can enrich a larger governance transformation.

A number of suggestions are made to maintain these successes. First, in order to overcome the limitations of power supply and connectivity that e-POS operations, investments in rural infrastructure are crucial. Second, by providing targeted digital literacy programs for beneficiaries and front-line staff, this exclusion can be reduced due to the limited understanding of technology. Thirdly, robust measures need to be implemented for cyber security to safeguard beneficiary data and maintain public trust in the digital welfare system. Fourth, the implementation should be harmonized in order to reduce inequalities in administration and ensure uniformity in service delivery through the country. Finally, cutting-edge technologies, such as blockchain, Internet of Things, and artificial intelligence, should be explored to enhance the use of SMART PDS for fraud detection, optimizing the supply chain in real time, and productive logistics, increasing SMART PDS's long-term viability.

Conclusion

The SMART public distribution system is a notable initiative in India's welfare government that exemplifies the potential of digital transformation to enhance productivity, transparency, and consumer empowerment on a massive scale. This has significantly reduced leakage and increased accountability through digitisation of over 20 crore ration cards, adding Aadhaar authentication and deploying e-POS in the country. On top of these benefits, integration with PM Gati Shakti highlighted the financial and environmental benefits of digital supply chain management, and ONORC expanded these benefits by allowing migrant workers to have mobility of entitlements, thus making the system more inclusive.

Despite these accomplishments, problems in state-level harmonization, infrastructure, and digital literacy persist. This is to ensure a fair distribution and sustainability of these resources. The report not only highlights the smart nature of SMART PDS as a governance innovation but also a technological innovation with lessons to be learned for other welfare systems globally. Future research should further extend this work by primary field investigation and integration of the latest technology in order to make welfare delivery changes according to the needs of the diversified people of India.



References

- [1] Radhakrishna, R., Subbarao, K., Indrakant, S., & Ravi, C. (1997). *India's Public Distribution System: A national and international perspective*. World Bank Discussion Paper No. 380. Washington, DC: The World Bank.
- [2] National Informatics Centre (NIC). (2019). *Digital initiatives in Public Distribution System: Technology architecture and implementation*. New Delhi: Ministry of Electronics and Information Technology, Government of India.
- [3] Khera, R. (2011). *Revival of the Public Distribution System: Evidence and explanations*. *Economic and Political Weekly*, 46(44–45), 36–50.
- [4] Gulati, A., & Saini, S. (2015). *Leakages in India's Public Distribution System: Why reforms are essential*. Indian Council for Research on International Economic Relations (ICRIER) Working Paper No. 294.
- [5] Government of India. (2025, August 12). *SMART Public Distribution System (SMART-PDS): Budget, implementation, and features*. Rajya Sabha Unstarred Question No. 2604. Ministry of Consumer Affairs, Food & Public Distribution. Retrieved from <https://sansad.in>
- [6] Government of India. (2026, February 4). *Progress of digitalization of PDS across States and Union Territories*. Lok Sabha Unstarred Question No. 857. Ministry of Consumer Affairs, Food & Public Distribution. Retrieved from <https://sansad.in>
- [7] Government of India. (2025, December 17). *Digitization initiatives in PDS: Technologies and reforms*. Lok Sabha Unstarred Question No. 2771. Ministry of Consumer Affairs, Food & Public Distribution. Retrieved from <https://sansad.in>
- [8] Press Information Bureau. (2024, November 20). *Centre committed to efficient and transparent Public Distribution System: Digitization, Aadhaar seeding, and ONORC portability*. Ministry of Consumer Affairs, Food & Public Distribution. Retrieved from <https://pib.gov.in>
- [9] Standing Committee on Consumer Affairs, Food & Public Distribution. (2026, July 24). *Report on modernization of the Public Distribution System under NFSA and SMART-PDS*. Vision IAS Current Affairs. Retrieved from <https://visionias.in>