

UPI - DBT Integration under Digital India: Transforming Last-Mile Welfare Delivery Metrics

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Abstract

The integration of the Unified Payments Interface (UPI) with the Direct Benefit Transfer (DBT) framework represents a major transformation in India's welfare governance architecture under the Digital India initiative. By enabling direct, real-time, and traceable financial transfers to beneficiaries, the system has significantly improved transparency, reduced administrative leakages, and strengthened accountability in public service delivery. This study examines the implications of UPI-DBT integration for last-mile welfare administration through a descriptive and analytical assessment of secondary data obtained from the National Payments Corporation of India (NPCI), government reports, NITI Aayog publications, and audit documents.

The findings indicate that the rapid expansion of UPI infrastructure has substantially enhanced the operational efficiency of welfare transfers across multiple government schemes. In February 2026, UPI processed approximately 20.39 billion transactions valued at ₹26.84 lakh crore, reflecting a significant increase in transaction volume and demonstrating the growing institutional reliance on digital payment systems. The integration of Aadhaar-enabled authentication mechanisms and Public Financial Management System (PFMS) routing has contributed to faster fund disbursement, improved beneficiary verification, and reduced duplication in welfare databases. Evidence further suggests that DBT linked digital systems have generated cumulative fiscal savings exceeding ₹3.48 lakh crore through the elimination of ghost beneficiaries and leakages.

The study also highlights the role of digital public infrastructure in expanding welfare accessibility in rural regions through BharatNet connectivity and Aadhaar enabled payment systems. Nevertheless, challenges related to digital literacy, internet connectivity, authentication failures, and infrastructural inequality continue to limit the inclusiveness of digital welfare governance. The paper argues that UPI-DBT integration should be understood not merely as a technological advancement but as a broader institutional reform aimed at reconfiguring public administration through data-driven and citizen-centric governance mechanisms. The study concludes by emphasizing the need for inclusive digital capacity building, rural infrastructure expansion, and institutional safeguards to ensure sustainable and equitable welfare delivery.

Keywords: *Digital India; UPI; Direct Benefit Transfer; Digital Governance; Welfare Delivery; Financial Inclusion; Public Administration*

Introduction

Digital transformation has become a defining feature of governance reforms in contemporary India. The Digital India initiative has accelerated the adoption of digital public infrastructure across sectors, particularly in welfare administration and financial governance. Within this broader transformation, the integration of the Unified

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Payments Interface (UPI) with the Direct Benefit Transfer (DBT) system has emerged as a significant institutional innovation aimed at improving the efficiency, transparency, and accountability of welfare delivery mechanisms.

Historically, welfare distribution in India was characterized by procedural delays, administrative fragmentation, leakages, and intermediary dependence. Traditional subsidy delivery systems often resulted in duplication, corruption, and exclusion errors that weakened the effectiveness of public expenditure. The introduction of DBT sought to address these challenges by transferring welfare benefits directly into beneficiaries' bank accounts through Aadhaar linked authentication systems. The subsequent expansion of UPI as a real-time digital payment platform further strengthened this framework by enabling seamless and interoperable financial transactions across banking institutions.

The convergence of UPI and DBT has transformed the operational structure of welfare administration by facilitating faster fund disbursement, reducing transaction costs, and improving beneficiary verification processes. This integration has become particularly significant in schemes such as PM KISAN, MGNREGA, pensions, and housing assistance programs, where timely delivery of financial support directly affects socio-economic welfare. The increasing scale of digital transactions demonstrates the institutionalization of digital payment infrastructure within public administration. Recent data from NPCI indicate that UPI has evolved into one of the largest real-time payment systems globally, processing billions of transactions monthly and supporting a wide range of government-to-citizen transfers.

Despite these advancements, important concerns remain regarding the inclusiveness and sustainability of digital welfare systems. Rural disparities in internet access, low levels of digital literacy, authentication failures, and infrastructural limitations continue to affect the effectiveness of last-mile service delivery. While macro-level indicators highlight improvements in transparency and fiscal efficiency, the actual experience of beneficiaries varies across regions and socio-economic groups. Consequently, the relationship between digital infrastructure and welfare outcomes requires deeper analytical examination.

This study investigates the role of UPI-DBT integration in transforming last-mile welfare delivery under Digital India. It focuses on transaction efficiency, leakage reduction, administrative accountability, and financial inclusion while also examining the structural challenges associated with digital governance. By analyzing recent transaction metrics and institutional developments, the paper argues that UPI-DBT integration represents not only a technological advancement but also a broader shift toward data-driven and citizen-centric public administration in developing economies.

Literature Review

The growing body of literature on digital governance emphasizes the transformative role of digital public infrastructure in improving administrative efficiency and welfare delivery. Several theoretical perspectives provide a useful framework for understanding the integration of UPI and DBT within India's governance architecture.

The Technology Acceptance Model (TAM) explains digital adoption in terms of perceived usefulness and ease of use. In the context of welfare delivery, digital systems are more likely to be accepted when they reduce procedural complexity and improve accessibility. UPI's interoperable architecture and real-time payment capability enhance convenience for beneficiaries while reducing transaction costs for implementing agencies. These features contribute to broader acceptance of digital financial systems among both citizens and administrators.

Another relevant perspective emerges from New Public Management (NPM), which advocates efficiency, accountability, and performance-oriented governance. UPI-DBT integration reflects this transition toward measurable and technology-driven administration by improving transparency in fund transfers and reducing opportunities for discretionary intervention. The increasing use of real-time monitoring systems and digital transaction records aligns with contemporary governance models emphasizing accountability and outcome-based administration.

The Information and Communication Technology for Development (ICT4D) framework also offers important insights, particularly regarding the relationship between technological design and implementation realities. Scholars within this tradition argue that the success of digital governance initiatives depends not only on technological innovation but also on infrastructural readiness, institutional capacity, and social inclusion. In India, disparities in

internet connectivity, banking access, and digital literacy continue to influence the effectiveness of digital welfare systems, particularly in rural and marginalized regions.

Empirical studies on DBT generally indicate improvements in subsidy targeting, transparency, and fiscal efficiency. Research suggests that Aadhaar enabled authentication mechanisms reduce duplication and eliminate ghost beneficiaries, thereby improving the accuracy of welfare distribution. Similarly, studies on digital payment systems highlight the contribution of UPI in promoting financial inclusion and expanding formal banking participation. Government reports and audit assessments further indicate substantial reductions in administrative leakages and improvements in transaction speed following the implementation of DBT linked systems.

However, the literature also identifies several persistent challenges. Researchers have documented issues related to biometric authentication failures, KYC mismatches, limited smartphone access, and inadequate digital literacy among vulnerable populations. These barriers often result in uneven implementation outcomes and create the possibility of exclusion within digitally mediated welfare systems. Concerns have also been raised regarding cybersecurity risks, data privacy, and the concentration of digital governance infrastructure.

Comparative international experiences provide additional analytical context. Welfare delivery systems such as Brazil's Bolsa Família and Kenya's mobile money transfer mechanisms demonstrate that digital financial infrastructure can strengthen welfare administration when supported by strong institutional frameworks. India's experience remains distinctive because of the scale of its population, the integration of biometric identity systems, and the extensive use of interoperable digital payment architecture.

Although existing scholarship recognizes the transformative potential of digital governance, relatively limited attention has been given to the combined implications of UPI and DBT integration within a unified welfare delivery framework. Most studies examine digital payments or welfare administration separately rather than analyzing their interaction within the broader context of Digital India. This study addresses that gap by examining UPI-DBT integration as an integrated model of digital welfare governance and evaluating its implications for last mile service delivery.

Conceptual Framework

The analytical framework of this study is based on the intersection of digital governance, financial inclusion, and public administration reform. UPI-DBT integration operates through a combination of interoperable payment infrastructure, biometric authentication, and direct financial transfers that collectively improve welfare delivery efficiency.

Table 1: UPI-DBT Integration Framework: Governance, Inclusion, and Administrative Efficiency

Framework Dimension	UPI-DBT Application	Administrative Outcome	Key Indicator
Interoperability	NPCI-enabled real-time transfers	Faster fund disbursement	Transaction success rates
Financial Inclusion	Aadhaar linked bank accounts	Expanded beneficiary access	Increase in rural participation
Transparency	Real-time transaction records	Reduction in leakages	Fiscal savings
Accountability	Digital verification systems	Improved monitoring	Reduction in ghost beneficiaries
Administrative Efficiency	PFMS integration	Faster welfare delivery	Reduced payment delays

The framework conceptualizes digital public infrastructure as both a technological and institutional mechanism capable of restructuring welfare governance through transparency, efficiency, and direct citizen engagement.

Evolution and Operational Mechanisms of UPI-DBT Integration

The evolution of UPI-DBT integration reflects the broader expansion of digital public infrastructure under Digital India. DBT was introduced to streamline welfare transfers through Aadhaar linked beneficiary identification, while UPI subsequently emerged as a real-time interoperable payment system facilitating seamless financial transactions across banking institutions. The convergence of these systems created an integrated digital architecture capable of supporting large-scale welfare transfers.

Operationally, the system functions through multiple interconnected stages. Beneficiary authentication is first conducted through Aadhaar linked verification mechanisms. Once eligibility is confirmed, welfare payments are routed through the Public Financial Management System (PFMS), which coordinates transfers to bank accounts using NPCI payment infrastructure. UPI enabled banking networks ensure that transactions are processed rapidly and transparently, thereby minimizing delays and administrative inefficiencies.

The expansion of BharatNet and Aadhaar enabled Payment Systems (AePS) has further strengthened rural outreach by enabling banking access in remote areas through digital kiosks and micro-banking infrastructure. This integration has become particularly important for welfare schemes involving wage payments, pensions, agricultural assistance, and housing support.

Recent transaction statistics demonstrate the growing institutional reliance on digital payment systems. In February 2026, UPI processed approximately 20.39 billion transactions valued at ₹26.84 lakh crore. The expansion of digital payment infrastructure has also contributed to increased merchant adoption and wider participation in formal financial systems. These developments indicate that digital payment architecture is increasingly embedded within India's governance framework.

Quantitative Impact on Last Mile Welfare Delivery

The integration of UPI and DBT has generated measurable improvements in welfare administration. One of the most significant outcomes has been the reduction in administrative leakages and duplication. Aadhaar linked authentication systems have improved beneficiary identification processes and minimized the prevalence of ghost beneficiaries across welfare databases.

Table 2: Quantitative Trends in UPI-DBT Integration and Welfare Delivery Outcomes (2023–2026)

Year	UPI Volume (Bn)	DBT Transfers (₹L Cr)	Savings (₹L Cr)
2023	8.5	10.2	1.8
2024	14.2	15.6	2.6
2025	18.7	19.8	3.2
2026 (Feb)	20.39	26.84 (monthly)	3.48 (cum.)

The implementation of digital transfers has also reduced delays in welfare disbursement. Programs such as MGNREGA and PM-KISAN have experienced faster transaction processing, enabling beneficiaries to receive payments more efficiently than under conventional distribution mechanisms. Real time payment tracking has strengthened accountability and improved audit transparency within public expenditure systems.

Table 3: UPI-DBT Integration and Improvements in Welfare Distribution Mechanisms

Scheme	Beneficiaries (Crore)	Approximate DBT Value (₹ Lakh Crore)	Observed Administrative Improvement
PM-KISAN	8.5	2.7	Improved transfer accuracy

MGNREGA	12	1.2	Faster wage disbursement
PMAY	3.2	0.8	Better beneficiary targeting

Fiscal savings associated with DBT-linked systems have also been substantial. Government assessments indicate cumulative savings exceeding ₹3.48 lakh crore through the elimination of duplication and leakages. Additionally, digital transaction records have enhanced administrative monitoring and strengthened compliance mechanisms within welfare governance.

Nevertheless, the benefits of digital welfare systems remain unevenly distributed. Rural regions continue to face infrastructural barriers, including unstable internet connectivity and limited digital literacy. Authentication failures and banking access constraints further affect implementation efficiency among vulnerable populations.

Challenges and Policy Recommendations

Despite notable achievements, several structural challenges continue to affect the effectiveness of UPI-DBT integration. Digital exclusion remains a major concern, particularly among rural populations with limited internet access and inadequate digital literacy. Authentication failures associated with biometric verification systems also create barriers for beneficiaries dependent on welfare support.

Cyber security risks constitute another emerging challenge. The expansion of digital transactions has increased exposure to online fraud, phishing, and unauthorized access to financial data. Ensuring data protection and institutional safeguards is therefore essential for maintaining public trust in digital governance systems.

To strengthen the sustainability and inclusiveness of digital welfare administration, the following policy measures are recommended:

1. Expansion of rural digital infrastructure through accelerated broadband and 5G connectivity initiatives.
2. Strengthening digital literacy programs aimed at vulnerable and marginalized populations.
3. Improving grievance redressal systems for authentication and transaction failures.
4. Enhancing cyber security frameworks and data protection mechanisms.
5. Promoting institutional coordination between financial institutions, state agencies, and local governance bodies.
6. Expanding offline digital payment infrastructure in regions with limited connectivity.

These measures are essential for ensuring that digital governance reforms remain inclusive, equitable, and accessible across socio-economic groups.

Conclusion

The integration of UPI with DBT under Digital India represents a major transformation in India's welfare governance framework. By combining interoperable payment systems, biometric authentication, and direct financial transfers, the system has improved transparency, administrative efficiency, and accountability in welfare delivery. The rapid expansion of digital payment infrastructure demonstrates the increasing institutionalization of technology-driven governance within public administration.

The study shows that UPI-DBT integration has contributed to faster fund disbursement, reduced leakages, and improved beneficiary targeting across major welfare schemes. At the same time, persistent challenges related to digital exclusion, infrastructural inequality, and cybersecurity continue to affect the inclusiveness of digital welfare systems.

The broader significance of UPI-DBT integration lies in its role as both a technological innovation and an institutional reform mechanism capable of reshaping welfare governance in developing economies. The experience

of India illustrates how digital public infrastructure can strengthen citizen-centric governance when supported by adequate institutional capacity and inclusive policy frameworks. Future research may further examine regional disparities, beneficiary experiences, and long-term governance outcomes associated with digital welfare systems.

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