

# **Impact of Digital Payment Infrastructure on Direct Benefit Transfer (DBT) Efficiency and Financial Inclusion: A Study of Gundlupet Taluk.**

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## **Abstract:**

The expansion of digital payment infrastructure has significantly transformed the delivery of welfare schemes through Direct Benefit Transfer (DBT), particularly in semi-urban and rural regions such as Gundlupet Taluk of Karnataka. This study examines how digital payment systems—including Aadhaar-enabled payment systems (AEPS), mobile banking, Unified Payments Interface (UPI), and direct bank transfers—have influenced the efficiency, transparency, and accessibility of DBT schemes, while promoting financial inclusion among marginalized and low-income populations. The study highlights that digital payment infrastructure has enhanced the speed and accuracy of fund transfers, minimized leakages, reduced dependency on intermediaries, and improved accountability in public service delivery. Additionally, it has facilitated greater participation of rural households in formal financial systems by encouraging bank account usage and digital transactions. However, the study also identifies persistent challenges such as inadequate digital literacy, limited internet connectivity, technical glitches, and lack of awareness among beneficiaries, which hinder the optimal utilization of digital platforms. The findings emphasize the need for strengthening digital infrastructure, promoting financial literacy, and ensuring inclusive access to technology. Overall, the integration of digital payment systems with DBT initiatives plays a crucial role in advancing financial inclusion and improving governance efficiency in rural areas like Gundlupet Taluk.

**Keywords:** FinTech-enabled Digital Payments, Direct Benefit Transfer (DBT), Financial Inclusion,

## **1. Introduction**

The impact of FinTech-enabled digital payment infrastructure on the effectiveness of government Direct Benefit Transfer (DBT) programs and financial inclusion is significant and multifaceted. FinTech innovations such as mobile payment systems, blockchain solutions, and digital banking platforms substantially enhance the efficiency, transparency, and accessibility of DBT programs by lowering delivery costs and expanding reach, especially to underserved and remote populations. These technologies enable governments to transfer benefits directly to beneficiaries' digital wallets, reducing leakages, corruption, and delays that typically plague traditional cash-based disbursements. This facilitates timely and accurate delivery of subsidies and welfare payments, thereby improving the effectiveness of DBT programs.



Mobile payment systems have empowered financial inclusion by enabling peer-to-peer transactions and micro-lending, which are crucial for populations without access to conventional banking services (Ebirim and Odonkor, 2024). Evidence from countries like India and Kenya demonstrates that Aadhaar-enabled payment systems and mobile money platforms have dramatically increased financial access and participation among unbanked and underbanked populations, addressing socioeconomic, geographic, and gender barriers (Adelaja et al., 2024). The integration of digital identity solutions and simplified account opening processes, combined with interoperable electronic payment systems, form foundational pillars for scaling DBT programs and broader financial inclusion (Arner et al., 2020).

FinTech infrastructure facilitates not only the disbursement of benefits but also supports transparent tracking and auditability via blockchain and digital transaction records, thereby enhancing accountability and trust among beneficiaries and government agencies (Ebirim and Odonkor, 2024). However, successful implementation requires robust regulatory frameworks that balance innovation with security and consumer protection to sustain trust and uptake (Guild, 2017). Moreover, digital financial literacy emerges as a crucial mediator influencing the effectiveness of FinTech uptake and its consequent impact on financial inclusion, necessitating investments in user education and awareness programs (Amnas et al., 2024).

Collaborative approaches involving governments, private sector FinTech providers, international organizations, and communities are essential to develop inclusive digital financial ecosystems that support sustainable development goals (SDGs) through enhanced financial inclusion and social equity (Danladi et al., 2023). Despite the transformative potential, challenges persist such as digital divides, limited infrastructure access, and regulatory barriers, which can moderate the positive impact of FinTech on DBT effectiveness and financial inclusion. Addressing these challenges requires coordinated strategies focusing on infrastructure development, digital literacy, adaptive regulation, and equitable access (Odei-Appiah et al., 2022).

Overall, FinTech-enabled digital payment infrastructure improves the efficiency, transparency, and reach of government DBT programs, thereby enhancing their effectiveness and significantly advancing financial inclusion among marginalized populations. This, in turn, facilitates economic growth, poverty alleviation, and progress towards sustainable development (Ebirim and Odonkor, 2024; Adelaja et al., 2024; Arner et al., 2020; Danladi et al., 2023; Amnas et al., 2024).

## 2. Literature Review

The evolution of FinTech in digital payments reflects a rapid transformation from traditional banking toward innovative, technology-driven financial services. FinTech has expanded from early electronic payment methods to encompassing mobile payments, peer-to-peer lending, blockchain, artificial intelligence (AI), and cryptocurrencies. This evolution is propelled by advancements in information technology, sharing economies, and shifting regulatory landscapes, all contributing to more inclusive, efficient, and customer-centric financial ecosystems (Suryono et al., 2020; Sanyaolu et al., 2024).

Key technologies in digital payment systems include mobile wallets, blockchain-based platforms, digital banking interfaces, and cryptocurrencies such as Bitcoin. Mobile payment systems have been pivotal in expanding financial accessibility, particularly for remote and underserved populations, by enabling peer-to-peer transactions and micro-lending. Blockchain technology adds layers of transparency, security, and

immutability to payment processes, improving trust and efficiency. Additionally, AI and machine learning enhance personalization, risk management, and operational workflows, driving efficiencies and enabling new business models such as crowdfunding and invoice trading (Ebirim and Odonkor, 2024; Qur'Anisa et al., 2024; Pazouki et al., 2025; Sharma et al., 2023).

Implementing digital payment infrastructure presents several challenges, including regulatory and legal complexities as tax and compliance systems struggle to keep pace with rapid FinTech innovation. Security risks and data privacy concerns remain significant, especially for digital wallets and blockchain platforms. Infrastructure gaps and limited digital literacy hinder wider adoption, particularly in developing regions where access to technology is uneven. Navigating the varied legal frameworks across jurisdictions poses compliance difficulties that can constrain innovation and scaling (Suryono et al., 2020; Adeoye et al., 2024; Qur'Anisa et al., 2024).

Conversely, FinTech opens substantial opportunities for financial inclusion by lowering transaction costs, expanding service accessibility, and empowering marginalized groups. AI and data analytics improve customer service and operational efficiency, while new business models diversify financing options for small businesses and underbanked populations. Adaptive regulatory frameworks that balance innovation with consumer safety can unlock further growth and integration of FinTech solutions within traditional financial systems, fostering a more inclusive and resilient global financial ecosystem (Chen, 2024; Ebirim and Odonkor, 2024; Suryono et al., 2020).

### **3. Research Gap**

While several studies have analyzed digital payment systems and DBT programs at the national and state levels, limited research focuses on rural taluks like Gundlupete. There is inadequate empirical evidence examining how digital payment infrastructure improves DBT efficiency and transparency at the grassroots level. Additionally, the actual impact of DBT on financial inclusion, along with challenges such as awareness and digital literacy, remains underexplored.

### **4. Research Objectives**

1. To examine the impact of digital payment infrastructure on the efficiency and effectiveness of Direct Benefit Transfer (DBT) programs in Gundlupete Taluk.
2. To assess the role of digital payment systems in promoting financial inclusion among DBT beneficiaries in Gundlupete Taluk.

#### **Specific research questions to be addressed include:**

1. How does digital payment infrastructure influence the efficiency and timeliness of Direct Benefit Transfer (DBT) disbursement in Gundlupete Taluk?
2. What is the level of awareness and usage of digital payment platforms among DBT beneficiaries in the study area?
3. To what extent has DBT implementation contributed to improving financial inclusion among beneficiaries?
4. What challenges do beneficiaries face in accessing and utilizing digital payment systems for receiving DBT benefits?

Based on these core objectives, the following hypothesis was formulated for empirical testing:

**H<sub>0</sub>:** There is no significant relationship between digital payment infrastructure and DBT efficiency or financial inclusion in Gundlupete Taluk.

**H<sub>1</sub>:** There is a significant relationship between digital payment infrastructure and DBT efficiency and financial inclusion in Gundlupete Taluk.

## 5. Research Methodology

Adopt a descriptive research design using a mixed-methods approach combining quantitative and qualitative techniques to examine the impact of digital payment infrastructure on Direct Benefit Transfer (DBT) efficiency and financial inclusion.

### Study Area and Population

**Location:** Gundlupete Taluk, Chamarajanagar District, Karnataka

**Population:** Beneficiaries of Government DBT schemes and users/non-users of digital payment platforms residing in Gundlupete Taluk.

### Sampling Method

Use stratified random sampling to ensure representation across different age groups, gender, occupation categories, and types of DBT beneficiaries.

**Sample Size:** 68 respondents

### Data Collection Methods

**Primary Data:** Structured questionnaires administered to DBT beneficiaries to collect data on digital payment usage, accessibility, transaction efficiency, awareness, and financial inclusion indicators. In-depth interviews with selected beneficiaries and local banking officials to gather qualitative insights regarding operational challenges and system effectiveness.

**Secondary Data:** Review of government reports, DBT records, RBI publications, banking statistics, and relevant research studies related to digital payments and financial inclusion.

### Independent Variable and Dependent Variables

