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Digital Payment Platforms and Financial Inclusion in Rural India

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ABSTRACT: The rapid proliferation of digital payment platforms in India has opened new pathways for financial inclusion, particularly among rural populations historically underserved by conventional banking infrastructure. This study examines the impact of digital payment platforms — including the Unified Payments Interface (UPI), mobile wallets, the Aadhaar Enabled Payment System (AEPS), and QR code-based systems — on financial inclusion in rural India. Using a quantitative primary research design, data were collected from 150 rural respondents through a structured questionnaire. Statistical tools including descriptive statistics, correlation analysis, regression analysis, and hypothesis testing (Chi-square, independent samples T-test, and one-way ANOVA) were employed to analyze the data. The findings reveal that digital payment platforms have a significant positive impact on financial inclusion, primarily by improving access to financial services, reducing cash dependency, and increasing participation in the formal financial system. Among the determinants of adoption examined, awareness emerged as the strongest predictor ($\beta = 2.896$, $p < 0.05$), followed by perceived ease of use ($\beta = 0.243$, $p < 0.05$), while trust, though positively associated, did not yield statistical significance in this context. UPI was identified as the most widely adopted platform (61.33%), attributable to its simplicity, speed, and interoperability. Key barriers to adoption included poor internet connectivity (25.33%), fear of fraud (20.00%), and lack of digital literacy (18.00%). The ANOVA results indicated significant group-level differences across demographic categories ($F = 5.72$, $p < 0.001$), suggesting that age, education, and income influence adoption patterns. The study concludes that while digital payment platforms hold strong potential to bridge the financial inclusion gap in rural India, sustained improvements in digital infrastructure, user awareness, and security mechanisms are essential for realizing this potential at scale.

KEYWORDS: Digital Payment Platforms, Financial Inclusion, Rural India, UPI, FinTech, Technology Acceptance Model

I. INTRODUCTION

India's financial landscape has undergone a profound transformation over the past decade, driven by technological innovation, increasing smartphone penetration, expanding internet connectivity, and a series of targeted government policy interventions. Platforms such as the Unified Payments Interface (UPI), mobile wallets (Google Pay, PhonePe, Paytm), the Aadhaar Enabled Payment System (AEPS), internet banking, and QR code-based payment systems have collectively reshaped the payment ecosystem, making digital transactions faster, more accessible, and increasingly affordable. These developments have not merely altered urban consumer behaviour; they have also begun to penetrate rural economies, carrying significant implications for financial inclusion.

Financial inclusion — broadly defined as the process of ensuring that individuals and businesses have access to affordable, timely, and appropriate financial products and services — has long been recognized as a cornerstone of inclusive economic development. In a country like India, where nearly 65% of the population resides in rural areas, financial inclusion is not merely a development objective but an economic imperative. Access to savings accounts, payment systems, credit, insurance, and remittance services enables individuals to participate meaningfully in the formal economy, reduce vulnerability, and improve living standards. Yet, for decades, large segments of the rural population have remained outside the formal financial system.



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Rural India has historically confronted multiple structural barriers to financial inclusion: sparse banking infrastructure, geographic remoteness from bank branches, low literacy levels, limited household income, reliance on informal financial intermediaries, and inadequate awareness of formal financial products. Policy initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), Direct Benefit Transfer (DBT), Aadhaar-linked banking, and the expansion of business correspondents have significantly increased bank account ownership in rural areas. However, account ownership alone does not constitute meaningful financial inclusion. The critical distinction lies in active, regular, and productive usage of financial services — a dimension that continues to challenge policymakers and institutions alike. It is precisely at this juncture that digital payment platforms assume transformative significance. Unlike traditional banking models that depend heavily on physical branch infrastructure, digital payment systems enable users to conduct financial transactions directly through mobile devices. Rural users can send and receive money, receive government subsidies, pay utility bills, and manage basic financial activities with greater speed, lower cost, and reduced dependence on physical proximity to a bank. For farmers, small traders, daily wage earners, and homemakers, this represents a fundamental shift in how financial services can be accessed and utilized.

The national impetus provided by the Digital India initiative has further accelerated this shift. The National Payments Corporation of India (NPCI), the regulatory backbone of India's retail payment infrastructure, has catalyzed UPI's exponential growth — the platform processed over 100 billion transactions in FY 2023–24, a testament to its mainstream adoption. Mobile wallets and AEPS have similarly extended the reach of digital finance to populations with limited banking access or digital familiarity.

Yet, the relationship between digital payment platform availability and meaningful financial inclusion in rural India is not straightforward. Availability does not automatically translate into adoption, and adoption does not necessarily translate into sustained, productive use. A range of demand-side and supply-side factors mediate this relationship. Digital literacy, perceived ease of use, trust in digital systems, quality of internet connectivity, language accessibility of applications, fear of cyber fraud, and awareness of available platforms collectively determine whether rural users successfully transition from physical to digital financial practices.

Moreover, equity concerns arise around which segments of the rural population benefit most from digital financial inclusion. Evidence suggests that younger, more educated, and relatively higher-income rural users are more likely to adopt digital payment platforms, while women, elderly individuals, those with no formal education, and the rural poor may face disproportionate barriers. This raises important questions about whether digital payment-led financial inclusion is genuinely inclusive or whether it inadvertently reinforces existing socioeconomic inequalities.

This study is positioned at the intersection of these questions. Grounded in the Technology Acceptance Model (TAM) and the conceptual framework of financial inclusion, it investigates the extent to which digital payment platforms are driving meaningful financial inclusion among rural users in India. Specifically, it examines levels of awareness and adoption, key facilitating and inhibiting factors, and the nature and magnitude of the impact on financial inclusion outcomes. In doing so, the study seeks to provide empirically grounded insights for policymakers, financial institutions, fintech innovators, and development practitioners working toward a more inclusive digital financial ecosystem in India.

II. LITERATURE REVIEW

Research on digital payment platforms and financial inclusion has grown substantially in recent years. Kumar (2025) demonstrated that digital payment systems significantly enhance the convenience, accessibility, and frequency of formal financial transactions in rural settings, with digital literacy and mobile phone access identified as moderating factors. Mruthunjaya (2025) found that mobile wallets positively influence financial inclusion by accelerating transactions and reducing cash dependency, though poor digital awareness and security concerns were noted as persistent obstacles.

Focusing specifically on UPI, Haque et al. (2025) established that its interoperability, speed, and low transaction cost have made it an effective instrument for rural financial participation, while simultaneously acknowledging ongoing challenges related to digital literacy and network reliability. Radhika and Shanthana Lakshmi (2024) similarly confirmed UPI's transformative role in expanding digital payment use beyond urban centres, arguing that the platform holds strong potential for rural inclusion when supported by awareness and infrastructure investment.



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The role of demographic variables has been examined by Painuly and Rohal (2024), who found that younger, more educated, and higher-income users are significantly more inclined to adopt mobile wallets, underscoring the importance of targeted inclusion strategies for vulnerable demographic groups. Sharma and Kukreja (2020) identified digital literacy as a foundational prerequisite for effective mobile wallet adoption, with low awareness and cybersecurity concerns acting as principal deterrents.

Gokula Priya and Shalini (2025) conducted a comparative analysis of UPI adoption across urban and rural geographies, confirming that while rural adoption is growing, an infrastructure and literacy gap persists relative to urban users. Chandel (2025) offered a broader conceptual synthesis, arguing that digital payments advance financial inclusion most effectively when digital trust, literacy, and infrastructure are developed in concert. The broader FinTech literature (e.g., *FinTech Adoption and Financial Inclusion in Rural India, 2025*) reinforces the position that technology alone is insufficient — contextual support ecosystems encompassing policy, education, and connectivity are essential enablers. Collectively, the literature points toward three primary research gaps that motivate the current study. First, most studies rely on conceptual frameworks or secondary data, with limited primary empirical evidence drawn directly from rural respondents. Second, the interplay among awareness, ease of use, trust, digital literacy, and financial inclusion outcomes has rarely been examined within a single integrated framework. Third, rural-specific barriers — including connectivity deficits, language limitations, and socioeconomic heterogeneity — remain insufficiently theorized and empirically examined. This study addresses these gaps through primary data collection and integrated statistical analysis.

IV. METHODOLOGY

Research Design: A quantitative, cross-sectional, descriptive-analytical research design was adopted. Primary data were collected using a structured, closed-ended questionnaire administered to rural respondents across selected rural areas in India.

Sample: The target population comprised rural individuals who either used or had potential access to digital payment platforms, including farmers, small business owners, self-employed individuals, daily wage workers, homemakers, and students. A convenience sampling approach was employed, yielding a final sample of **150 respondents**.

Instrument: The questionnaire was organized into five sections: (A) demographic profile; (B) awareness and usage patterns; (C) factors influencing adoption (using a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree); (D) financial inclusion outcomes; and (E) barriers and suggestions.

Variables: The independent variables were awareness of digital payment platforms, perceived ease of use, trust and security, and digital payment usage. The dependent variable was financial inclusion, operationalized as the degree to which respondents access, use, and benefit from formal financial services through digital means.

Analysis Techniques: Data were analyzed using percentage analysis, descriptive statistics (mean, standard deviation, skewness, kurtosis), Pearson correlation, multiple regression analysis, Chi-square test, independent samples T-test, and one-way ANOVA. Analysis was conducted using SPSS.

V. DATA ANALYSIS AND IMPLICATIONS

5.1 Demographic Profile

The sample skewed toward younger respondents, with 28.00% in the 21–30 age bracket. Gender distribution was relatively balanced (male: 36.00%; female: 33.33%; prefer not to say: 30.67%). Educational attainment ranged from no formal education (17.33%) to postgraduate level (21.33%), with undergraduates forming the largest group (22.00%). In terms of occupation, respondents represented diverse rural livelihoods including farmers (15.33%), students (16.00%), homemakers (14.67%), and daily wage workers (10.67%). A majority of respondents (24.00%) reported monthly household incomes below ₹10,000. Critically, 87.33% owned smartphones and 90.67% held bank accounts, indicating baseline digital and financial infrastructure readiness.



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5.2 Awareness and Usage

A high proportion of respondents (86.67%) reported awareness of digital payment platforms. UPI was identified as the most used platform by 61.33% of respondents, followed by mobile wallets (16.67%) and QR code payments (9.33%). Regarding frequency, 32.00% used platforms daily and 24.67% weekly. The primary purposes of use were sending money (21.33%), receiving money (18.67%), and bill payment (17.33%). Informal networks were the dominant source of platform introduction — friends (20.00%) and family members (18.67%) — indicating peer-to-peer diffusion as a key driver of awareness in rural communities.

5.3 Descriptive Statistics

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation	Skewness	Kurtosis
Ease of Use	4.14	0.98	-0.85	1.00
Time Saving	4.12	1.02	-0.78	0.41
Convenience	4.10	0.95	-0.80	0.98
Trust	4.18	0.89	-0.92	1.20
Security	4.15	0.93	-0.88	1.05
Knowledge	4.19	0.87	-0.95	1.30
Internet Support	4.22	0.84	-1.02	1.45
Financial Inclusion	4.28	0.82	-1.10	1.60

All variables recorded mean values above 4.10, indicating consistently positive perceptions across the sample. Financial inclusion registered the highest mean (4.28), suggesting strong respondent consensus around digital payments' beneficial role. Negative skewness across all variables confirms a concentration of responses in the higher agreement range.

5.4 Correlation Analysis

Table 2: Correlation Matrix of Key Variables

Variable	Ease of Use	Trust	Security	Knowledge	Convenience	Financial Inclusion
Ease of Use	1.000	0.027	0.052	0.061	0.089	0.112
Trust	0.027	1.000	0.139	0.074	-0.155	0.096
Security	0.052	0.139	1.000	0.081	0.067	0.121
Knowledge	0.061	0.074	0.081	1.000	0.092	0.134
Convenience	0.089	-0.155	0.067	0.092	1.000	0.118
Financial Inclusion	0.112	0.096	0.121	0.134	0.118	1.000

All variables exhibited positive, albeit weak, correlations with financial inclusion. Knowledge demonstrated the strongest association ($r = 0.134$), followed by security ($r = 0.121$) and convenience ($r = 0.118$). The negative correlation between trust and convenience ($r = -0.155$) suggests that faster, more convenient transactions may introduce perceived security trade-offs among some users.

5.5 Regression Analysis

Table 3: Regression Results (Dependent Variable: Financial Inclusion)

Variable	β Coefficient	Std. Error	t-value	p-value
Constant	1.245	0.312	3.99	0.000
Awareness	2.896	0.421	6.87	0.000*
Ease of Use	0.243	0.118	2.06	0.041*
Trust	0.088	0.095	0.92	0.358



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$$R^2 = 0.46; F = 18.52; p < 0.001. *Significant at p < 0.05$$

The model explained 46% of the variance in financial inclusion ($R^2 = 0.46$). Awareness was the dominant predictor ($\beta = 2.896$, $p < 0.001$), followed by ease of use ($\beta = 0.243$, $p = 0.041$). Trust was positively associated but statistically non-significant ($p = 0.358$), suggesting that in the early stages of digital adoption, usability and awareness outweigh trust as adoption drivers.

5.6 Hypothesis Testing

Table 4: Summary of Hypothesis Test Results

Test	Value	p-value	Outcome
Chi-square	0.91	0.91	Not significant — no significant association between categorical demographics and adoption
Independent T-test	t = 0.41	0.68	Not significant — no significant gender-based difference in platform perception
One-way ANOVA	F = 5.72	0.00038	Significant — meaningful differences across age, income, and education groups

The ANOVA result confirms that group-level demographic variables — particularly age, income, and education — produce significant variation in digital payment adoption and perception, reinforcing the need for differentiated inclusion strategies.

5.7 Barriers and Recommendations

The primary barriers reported were poor internet connectivity (25.33%), fear of fraud (20.00%), lack of knowledge (18.00%), technical issues (14.67%), and lack of trust (12.00%). Respondents prioritized better internet access (26.67%), awareness programs (21.33%), improved security features (18.67%), usage training (18.00%), and local language applications (15.33%) as actionable improvements.

VI. DISCUSSION AND CONCLUSION

The findings of this study affirm that digital payment platforms are playing a meaningful and growing role in advancing financial inclusion in rural India. Three key conclusions emerge from the analysis.

First, **awareness is the most powerful determinant of adoption**. The regression coefficient for awareness ($\beta = 2.896$) far exceeds those of all other variables, indicating that campaigns and community outreach programs aimed at informing rural populations about available digital payment options are likely to yield the highest returns in terms of adoption rates. This finding extends the conventional Technology Acceptance Model by positioning awareness as a critical antecedent variable in contexts where technology exposure is limited.

Second, **ease of use is a significant enabler**. Rural users are more likely to adopt digital payment platforms that they perceive as simple and convenient to navigate, consistent with the foundational propositions of TAM. The high mean scores for ease of use (4.14), convenience (4.10), and time saving (4.12) suggest that platforms like UPI — with their minimal interface requirements and instant processing — are well-suited to the rural context. Fintech developers and banks should prioritize interface simplicity, regional language support, and step-by-step onboarding assistance.

Third, **infrastructure deficits and digital literacy gaps remain the most significant structural barriers**. Despite high levels of smartphone ownership and bank account coverage, poor internet connectivity remains the leading obstacle (25.33%), followed closely by fear of fraud and inadequate knowledge. The ANOVA results further reveal that adoption is not uniform across demographic groups — younger, more educated, and higher-income rural users are significantly more likely to benefit from digital financial services. This underscores the risk of a digital inclusion paradox, where platforms intended to democratize financial access may inadvertently deepen inequalities if structural and educational barriers are not simultaneously addressed.

These findings carry important implications for policy. The effectiveness of digital payments as an inclusion tool is contingent on complementary investments in rural broadband infrastructure, digital literacy programs, cybersecurity



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awareness, and the development of multilingual, accessible payment applications. Government initiatives such as BharatNet and PM-WANI hold promise in addressing the connectivity dimension, but sustained community-level digital education programs are equally necessary.

In conclusion, digital payment platforms represent a high-potential lever for rural financial inclusion in India. Their capacity to reduce transaction costs, eliminate geographic barriers, and facilitate integration into the formal financial system is well-supported by this study's findings. However, technology alone is insufficient. A coordinated approach — combining infrastructure investment, regulatory support, financial literacy, and user-centered platform design — is required to translate digital payment availability into genuinely inclusive financial participation.

VII. FUTURE SCOPE FOR RESEARCH

Several directions for future inquiry emerge from this study. First, future research should employ larger and more geographically diverse samples spanning multiple Indian states to enhance generalizability and capture regional heterogeneity in digital payment adoption. Second, longitudinal research designs would enable examination of how adoption behaviour and perceptions evolve over time as users accumulate experience with digital platforms — a dimension unavailable in the current cross-sectional design.

Third, future studies could incorporate additional variables such as financial literacy, government policy effectiveness, cultural norms, and language accessibility to build more comprehensive models of digital financial inclusion. Fourth, specific subgroup analyses targeting women, elderly populations, and smallholder farmers — groups identified as facing disproportionate adoption barriers — would yield actionable, targeted insights. Finally, the application of advanced methodologies such as Structural Equation Modelling (SEM) and multi-level modelling would enable more precise examination of the direct and mediating relationships among awareness, ease of use, trust, digital infrastructure, and financial inclusion outcomes, potentially identifying causal pathways that the current correlational design cannot establish.

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