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FINTECH AT THE FOOTPATH: ADOPTION, CHALLENGES, AND IMPACT OF DIGITAL PAYMENTS AMONG STREET VENDORS IN TELANGANA

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ABSTRACT

Street vendors form a vital part of India's informal economy. This study examines the adoption, challenges, and impact of digital payments (primarily UPI-based systems) among 250 street vendors across urban and semi-urban areas of Telangana. Primary data were collected through a structured questionnaire using stratified random sampling. Descriptive statistics, chi-square tests, independent t-tests, one-way ANOVA, and correlation analysis were applied. Results indicate high awareness (92%) and adoption (78%) of digital payments, driven by customer demand, ease of use, and government schemes such as PM-SVANidhi. Key challenges include network failures, fear of fraud, limited digital literacy, and delayed dispute resolution. Digital payment users reported significantly higher daily sales, better record-keeping, and improved access to formal credit compared with non-users. Demographic factors (age, education, and type of vending) significantly influence adoption. The study concludes that digital payments enhance financial inclusion and business resilience but require targeted literacy programmes, reliable infrastructure, and simplified grievance mechanisms. Policy implications for banks, fintech firms, and state authorities in Telangana are discussed.

KEYWORDS: Digital payments, UPI, street vendors, fintech adoption, Telangana, informal sector, financial inclusion, PM-SVANidhi

INTRODUCTION

India's digital payment ecosystem, anchored by the Unified Payments Interface (UPI), has grown exponentially. Telangana ranks among the leading states in per-capita UPI transactions. Street vendors estimated at over five lakhs in Telangana operate at the intersection of cash-based traditions and rising customer preference for contactless payments. Initiatives such as Digital India, PM-SVANidhi (which links working-capital loans with digital transactions), and widespread QR-code distribution have accelerated formalization of this segment.

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Yet adoption remains uneven. Many vendors face infrastructural, literacy, and trust barriers. Understanding the determinants of adoption, the nature of challenges, and the tangible impact on sales, customer relations, and access to credit is essential for designing inclusive fintech strategies. This paper investigates these dimensions among street vendors in Telangana.

REVIEW OF LITERATURE

The rapid diffusion of digital payment systems in India's informal economy has attracted substantial scholarly attention in recent years. Early studies focused primarily on consumer-side adoption of mobile wallets and UPI, but a growing body of work now examines the supply-side dynamics among micro-entrepreneurs and street vendors. Mathur, Kalyani and Yelamanchili (2025) analysed 400 PM-SVANidhi borrowers and established that performance expectancy and effort expectancy significantly enhance economic resilience, while FinTech adoption mediates the positive effect of the government scheme, underscoring the dual role of digital payments as both a transactional tool and a pathway to formal credit. Regional studies within Telangana provide granular insights: a descriptive investigation in Sircilla town (TIJER, 2023) revealed that customer insistence and self-motivation were the dominant drivers of digital payment acceptance among 120 street vendors, yet network failures, delayed credit alerts and high sound box rental charges constrained regular use; parallel research in Mahabubnagar (IOSR-JBM, 2026) confirmed high UPI penetration but identified technical glitches (mean barrier score 3.77) and cyber security concerns as the most severe obstacles, highlighting that infrastructure reliability remains a critical bottleneck even in a digitally progressive state.

National-level analyses reinforce and extend these observations. Using interpretive structural modelling, researchers (Business: Theory and Practice, 2024) mapped nine interlinked barriers perceived risk, lack of trust, cash culture, low financial literacy, limited awareness, social influence, lack of perceived benefit, perceived ease of use and digital illiteracy demonstrating that trust and awareness form the foundational layer upon which other barriers rest. In Coimbatore, a purposive sample of 152 urban vendors (Springer, 2025) showed that digital wallet users experienced measurable gains in sales volume, customer retention and operational efficiency, yet awareness gaps and technical difficulties persisted. Similarly, a Hanamkonda study (IJVRA, 2026) linked continuous UPI micro-transactions to improved creditworthiness through verifiable digital footprints that facilitated loan sanctions under PM-SVANidhi, while Bengaluru research (JICLT, 2025) confirmed high UPI penetration accompanied by persistent network and OTP failures. Additional works across multiple sources (2023–2026) document the role of QR codes, sound boxes and government campaigns in reducing transactional friction while noting ongoing issues of dispute resolution and cyber-fear.

Gender and literacy dimensions have also received focused attention. Qualitative work among women

vendors in Kolkata and Bengaluru (Citizen Matters, 2024) revealed that many women operate digital accounts registered in male relatives' names, limiting their independent financial agency. A larger survey of 566 marginalised women street vendors (Discover Sustainability, 2025) applied an extended UTAUT model and found that performance expectancy, effort expectancy, personal innovativeness and perceived trust significantly predict sustained engagement with QR-code systems. Complementing this, ethnographic research in Kashmir (Sage, 2023) documented literacy-independent adoption facilitated by audio sound boxes and peer demonstration, suggesting that technological design can partially compensate for low textual literacy. Emerald (2026) further highlighted dual-modality confirmation systems (voice and visual) that enable low-literacy users to participate effectively in digital payments.

Theoretical extensions of established models and recent multi-city evidence further enrich understanding. Prasad, Sharma and Suri (2023) augmented UTAUT2 with privacy risk, security and digital literacy constructs and, using PLS-SEM on 306 Delhi vendors, demonstrated that digital literacy exerts the strongest influence on behavioral intention. Technology-Organisation-Environment studies (Electronic Commerce Research, 2024) across 392 small retailers and 269 upstream suppliers showed that firm size, firm scope and competitive pressure significantly drive cashless adoption. Systems-theory research in Mumbai (2026) reported positive correlations between awareness, utilization and business performance, while Frontiers (2026) employed principal component analysis and random-forest modeling on Delhi-NCR vendors and confirmed that digital payment adoption strongly predicts business transition ($\beta = 0.64$) and subsequent socio-economic upliftment ($\beta = 0.58$). Emerald (2025) emphasized socially embedded trust in bottom-of-the-pyramid settings. Collectively, the literature establishes that while digital payments deliver tangible benefits in sales, efficiency and formalization, sustained and inclusive adoption hinges on reliable connectivity, targeted literacy interventions, trust-building measures and gender-sensitive design. The present study addresses the relative scarcity of multi-district Telangana evidence that simultaneously examines adoption drivers, multi-dimensional challenges and quantifiable business impacts through rigorous hypothesis testing.

RESEARCH GAP

Most existing studies are either city-specific (Sircilla, Mahabubnagar, Coimbatore, Bengaluru) or national in scope. Few provide a multi-district Telangana perspective with a moderately large sample (n=250), simultaneous examination of adoption determinants, challenges, and measurable business impact, and rigorous hypothesis testing using parametric and non-parametric techniques. Gender and education differentials within Telangana's informal vending ecosystem also remain under-explored.

OBJECTIVES

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- To assess the level of awareness and adoption of digital payments among street vendors in Telangana.
- To identify the major challenges faced in using digital payment systems.
- To examine the impact of digital payment adoption on sales, customer base, record-keeping, and access to formal credit.
- To analyse the influence of demographic variables (age, gender, education, type of vending, daily turnover) on adoption.
- To suggest policy and practical interventions for deeper digital inclusion.

HYPOTHESES

H_{01}: There is no significant association between demographic variables and adoption of digital payments.

H_{11}: There is a significant association between demographic variables and adoption of digital payments.

H_{02}: There is no significant difference in perceived challenges between adopters and non-adopters.

H_{12}: There is a significant difference in perceived challenges between adopters and non-adopters.

H_{03}: Digital payment adoption has no significant positive impact on business performance indicators (sales, customer base, credit access).

H_{13}: Digital payment adoption has a significant positive impact on business performance indicators.

RESEARCH METHODOLOGY

Descriptive and analytical research design. Primary data collected via structured questionnaire (closed and Likert-scale items) from 250 street vendors in Hyderabad, Warangal, Karimnagar, Nizamabad, and selected semi-urban markets of Telangana between January and March 2026. Stratified random sampling ensured representation across vegetable/fruit, food, clothing/accessories, and other vendors. Secondary sources included government reports, RBI/NPCI data, and peer-reviewed articles. Reliability (Cronbach's $\alpha > 0.78$ for multi-item scales) and content validity were established. Data analysed using SPSS: frequencies, percentages, means, chi-square, independent-samples t-test, one-way ANOVA, and Pearson correlation.

DATA ANALYSIS AND RESULTS

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Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	168	67.2
	Female	82	32.8
	Total	250	100
Age (years)	18-30	62	24.8
	31-45	118	47.2
	46-60	58	23.2
	Above 60	12	4.8
	Total	250	100
Education	Illiterate / Primary	78	31.2
	Secondary	97	38.8
	Higher Secondary / Graduate	75	30.0
	Total	250	100
Type of Vending	Vegetables / Fruits	89	35.6
	Prepared Food	71	28.4
	Clothing / Accessories	48	19.2
	Others	42	16.8
	Total	250	100
Daily Turnover (₹)	Up to 1,000	54	21.4
	1,001–3,000	112	4.8
	Above 3,000	84	33.6
	Total	250	100
Smartphone Ownership	Yes	231	92.4
	No	19	7.6
	Total	250	100

The sample is predominantly male (67.2 %) and concentrated in the economically active 31–45 age group (47.2 %). Educational attainment is moderate, with nearly one-third possessing only primary or no formal education. Vegetable and fruit vendors constitute the largest occupational category. High Smartphone ownership (92.4 %) indicates a favorable technological foundation for digital payment diffusion.

Table 2: Awareness, Adoption and Usage Patterns

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Particulars	Frequency	Percentage (%)
Awareness of digital payments / UPI / QR codes	230	92.0
Current adoption (accept digital payments)	195	78.0
Primary mode – UPI QR code	174	89.2 of adopters
Soundbox / speaker users	119	61.0 of adopters
Daily users	133	68.2 of adopters
Main reason – Customer demand	90	46.2 of adopters
Main reason – Ease and speed	55	28.2 of adopters
Main reason – Government / bank encouragement	29	14.9 of adopters
Main reason – Peer influence	21	10.8 of adopters

Awareness is nearly universal (92 %), and actual adoption stands at a robust 78 %. UPI QR codes dominate, and sound boxes have achieved substantial penetration. Customer demand remains the strongest external driver, confirming the demand-pull nature of adoption in the informal sector.

Table 3: Major Challenges Faced by Adopters (n = 195, multiple responses)

Challenge	Frequency	Percentage of Adopters (%)
Network / connectivity failure	112	57.4
Fear of fraud / cybersecurity concerns	87	44.6
Delayed credit / dispute resolution	69	35.4
Limited digital literacy	61	31.3
Cost of soundbox / data charges	48	24.6
Lack of immediate confirmation	42	21.5

Infrastructure-related problems (network failure) rank as the most pervasive challenge, followed closely by trust and security apprehensions. Literacy and cost barriers, though lower in incidence, remain material for a significant minority of vendors.

Table 4: Perceived Impact of Digital Payments on Business Performance (Adopters vs non-adopters)

Performance Indicator	Adopters Mean (SD)	Non-Adopters Mean (SD)	t-value	p-value
Increase in daily sales	3.84 (0.91)	2.71 (1.05)	6.84	0.000

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Increase in customer footfall	3.62 (0.98)	2.68 (1.12)	5.21	0.000
Improved record-keeping	4.05 (0.87)	2.45 (1.18)	9.37	0.000
Improved access to formal credit	3.48 (1.09)	2.29 (1.14)	4.97	0.000

Independent-samples t-tests reveal statistically significant differences ($p < 0.001$) across all four performance dimensions. Adopters consistently report higher mean scores, indicating tangible business benefits associated with digital payment acceptance.

Table 5: Hypothesis Testing Results – Association between Demographic Variables and Adoption (Chi-square)

Demographic Variable	χ^2 value	df	p-value	Decision
Age	18.47	3	0.000	Reject H_0
Education	27.63	2	0.000	Reject H_0
Gender	4.12	1	0.042	Reject H_0
Type of vending	9.85	3	0.020	Reject H_0
Daily turnover	11.24	2	0.004	Reject H_0

All tested demographic variables exhibit statistically significant associations with digital payment adoption at the 5 % level. Younger, better-educated, male vendors and those with higher daily turnover display elevated adoption rates. The null hypothesis of no association is rejected in every case.

Table 6: Hypothesis Testing – Difference in Perceived Challenges (Independent t-test)

Group	n	Mean Challenge Score	SD	t-value	p-value
Adopters	195	3.12	0.78	3.91	0.000
Non-adopters	55	3.68	0.84		

Non-adopters report a significantly higher composite challenge score ($p < 0.001$). The null hypothesis of no difference is rejected, confirming that perceived barriers are materially higher among those who have not yet adopted digital payments.

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Table 7: Hypothesis Testing – Impact of Adoption Intensity on Business Performance (Pearson Correlation & ANOVA)

Analysis	Statistic	Value	p-value	Decision
Pearson correlation (adoption intensity × performance index)	r = 0.58	-	0.000	Reject H_0
One-way ANOVA (performance by frequency of use)	F = 14.26	-	0.000	Reject H_0

A moderate-to-strong positive correlation ($r = 0.58$, $p < 0.001$) exists between frequency of digital payment use and the composite business performance index. ANOVA further confirms significant differences across usage-frequency groups. The null hypothesis of no positive impact is rejected.

DISCUSSION

The empirical results demonstrate that digital payment systems have achieved substantial penetration among street vendors in Telangana, with 78 per cent of the sampled vendors actively accepting UPI-based payments. This high adoption rate is primarily demand-driven, consistent with earlier observations in Sircilla and Mahabubnagar, where customer insistence emerged as the leading catalyst. The significant associations between adoption and demographic variables particularly age, education and daily turnover align with UTAUT-based studies that emphasize performance expectancy and facilitating conditions. Younger and better-educated vendors appear more willing to experiment with technology, while higher-turnover vendors possess both the incentive and the capacity to invest in sound boxes and data plans. These patterns suggest that digital payments are gradually becoming embedded in the operational routines of the more dynamic segments of the informal retail landscape. Sound box technology has partially mitigated literacy barriers, confirming recent qualitative insights on literacy-independent adoption.

Nevertheless, the persistence of network failures (reported by 57.4 per cent of adopters) and cyber security apprehensions (44.6 per cent) indicates that infrastructural and trust-related barriers continue to constrain seamless usage. These findings corroborate the interpretive structural modeling literature that positions trust and awareness as foundational barriers, as well as the technical-issue dominance reported in Mahabubnagar. The statistically significant difference in perceived challenges between adopters and non-adopters further implies that residual barriers, once overcome, diminish in salience—an encouraging sign for diffusion. Yet the continued presence of delayed dispute resolution and residual literacy gaps, along with gender and education disparities, points to unfinished institutional work that banks, fintech providers and local administrations must address.

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The positive and significant impact of digital payment adoption on sales, customer footfall, record-keeping and access to formal credit constitutes the most policy-relevant finding. The moderate-to-strong correlation (r = 0.58) between usage intensity and the composite performance index, together with the large t-statistics comparing adopters and non-adopters, provides robust evidence that digital payments function as more than a mere payment channel; they serve as a formalization and resilience tool. This outcome resonates with the mediation role of FinTech identified by Mathur et al. (2025) and the creditworthiness gains documented in Hanamkonda, while also supporting the formalization objective of PM-SVANidhi. Collectively, the results affirm that digital payments can advance both financial inclusion and micro-enterprise performance, provided complementary investments in connectivity, trust-building and targeted capacity development are sustained.

CONCLUSION

This study of 250 street vendors across multiple districts of Telangana establishes that digital payments chiefly UPI QR codes supported by sound boxes have moved from the periphery to the mainstream of informal retail transactions. Awareness exceeds 90 per cent and adoption stands at 78 per cent, driven largely by customer demand and reinforced by government schemes such as PM-SVANidhi. Demographic analysis reveals systematic variation, with younger, better-educated and higher-turnover vendors displaying significantly higher adoption rates. While network unreliability and residual trust concerns remain the principal operational frictions, adopters report statistically significant gains in daily sales, customer traffic, record-keeping discipline and access to formal credit. These findings collectively demonstrate that fintech at the footpath is delivering measurable economic value in terms of sales, efficiency and formalization.

For these gains to be deepened and broadened, coordinated action is required on three fronts. First, public and private stakeholders must priorities last-mile network reliability in major vending clusters. Second, continuous, vernacular and low-literacy training programmes should be institutionalized under existing livelihood missions. Third, simplified, time-bound grievance-redressal mechanisms and affordable sound box solutions need wider deployment. When these complementary conditions are met, digital payments can evolve from a convenient transaction mode into a durable instrument of financial inclusion, business formalization and socio-economic resilience for Telangana Street-vendor community.

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