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IMPACT OF UNIFIED PAYMENTS INTERFACE (UPI) ADOPTION ON CASH FLOW MANAGEMENT OF SMALL BUSINESSES IN RANCHI: AN EMPIRICAL STUDY

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Abstract: This study examines the impact of Unified Payments Interface (UPI) adoption on the cash flow management practices of small businesses in Ranchi, a Tier-2 city characterized by a hybrid commercial environment combining traditional cash-based practices with increasing digital integration. Using a descriptive and analytical research design, primary data were collected from 65 small business owners through structured questionnaires administered across six key commercial zones. The study evaluates how UPI usage influences liquidity management, receivables, payables, working capital efficiency, and overall financial discipline. It further investigates advantages and barriers associated with digital payment adoption. The theoretical framework incorporates the Technology Acceptance Model (TAM), Financial Inclusion Theory, and Working Capital Theory. Statistical tools including one-sample t-tests ($t = 4.965$, $p < 0.001$; composite $t = 7.749$, $p < 0.001$), Pearson correlation, chi-square tests, and regression analysis were applied. Findings reveal that UPI adoption significantly improves transaction efficiency, accelerates cash inflows, enhances financial record-keeping, and contributes to better cash flow visibility among MSMEs. The null hypothesis is rejected, confirming a statistically significant positive impact of UPI on cash flow management. However, challenges linked to network reliability, technical disruptions, and incomplete financial inclusion persist. Gender-based satisfaction differences were also found significant ($\chi^2 = 8.536$, $p = 0.036$), indicating structural disparities in digital access among women entrepreneurs.

Index Terms - UPI Adoption, MSMEs, Cash Flow Management, Financial Inclusion, Digital Payment, Ranchi, Working Capital

I. INTRODUCTION

1.1 Background of the Study

The fast-growing trend of the adoption of digital payments in India has greatly revolutionized the financial transaction process, especially in regards to the Micro, Small and Medium Enterprises (MSME) that operate in the informal sector. One innovation that has played a pivotal role in revolutionizing digital payments is the development of the Unified Payments Interface (UPI), introduced by the National Payments Corporation of India (NPCI) in 2016. Currently, small businesses operating in Ranchi, which

represents a Tier-2 city and India's mixed economy, are continuing to shift from cash towards digital payments.

Prior to the launch of UPI, the Indian small businesses operated on the cash basis due to lack of awareness regarding digital payment systems. However, due to the availability of cheap smartphones, the affordability of data services (courtesy of Reliance Jio), and the introduction of demonetization policy in 2016, Indian small businesses began embracing digital payments. In this regard, as of early 2024, UPI has recorded a staggering monthly transaction number of about 12 billion, thus beating other payment methods. Therefore, there is an urgent need to investigate the impact of UPI on small business transactions at the micro level.

Notably, Ranchi represents a unique economic environment, characterized by several commercial areas such as Main Road, Lalpur, Doranda, Hindpiri, Harmu, and Kanke Road, where both formal and informal businesses co-exist.

1.2 Statement of the Problem

Although there have been various academic studies at the macro level about the growth of UPI, there are very few studies that examine the impact of UPI on the cash flow management practices of small enterprises at the micro level, especially Tier-2 cities. There have been many studies that emphasize transaction volume and growth in users but have overlooked the operational financial impacts of the use of UPI among the MSME sector. Small enterprises encounter several problems, such as irregular cash flows, reliance on udhar system for borrowing money, low digital awareness, and lack of formal bookkeeping system. In addition to this, most of the research literature focuses on big city areas; hence, results cannot be extrapolated to semi-urban regions like Ranchi.

1.3 Significance of the Study

The current study is of multidimensional importance. It will contribute to a very limited body of academic research on the effects of digital payments on Indian Tier-2 cities and fill the gap between the technology adoption theories and small enterprise finance management. The current study can provide empirically grounded evidence that could help policy makers craft targeted policies to promote digital financial inclusion in their efforts to foster inclusive growth. For business practitioners, this study would provide guidance on making good use of the UPI system to manage their cash flow.

1.4 Scope of the Study

However, geographically, this research work will be confined to only six major commercial areas of Ranchi Municipal Corporation: Main Road, Lalpur, Doranda Market, Hindpiri, Harmu Market, and Kanke Road. This will consist of small entrepreneurs in the fields of retailing, wholesaling, food & beverage, services, and many other sectors with turnovers of ₹5 lakhs to ₹5 crores per annum. Aspects related to the use of UPI, dimensions of cash flow management (cash, receivable, payable, working capital), perceived advantages, problems faced, and influence of socio-demographic factors will be included in this research work. Information/data will be collected through a survey in May 2026 using questionnaires distributed among 65 respondents. However, the present research does not include any analysis at the macro level of the UPI eco-system, or comparisons between cities.

II. LITERATURE REVIEW

2.1 Review of Relevant Studies

There has been a significant increase in the literature related to the use of UPI and digital payments in India since 2016, although most of the literature relates to broader trends and urban areas. The review below highlights the important literature for the present research topic.

2.2 Digital Payment Adoption and Small Business Finance

The Technology Acceptance Model was formulated by Davis in 1989 and is based on PU and PEOU. The latter framework is employed in this research work. Venkatesh et al. introduced UTAUT in 2003 and expanded the TAM framework to include factors of social influence and facilitating conditions, which are critical when considering small business adoption in semi-urban India.

According to Bansal & Kumar (2022), the use of digital payment systems for financial inclusion in India showed positive effects on the use of formal financial institutions by small traders. Similarly, Gupta & Sharma (2020) analyzed the effects of digital payments on revenue management and transaction speed

in small businesses in urban areas in India and observed improvements in both areas. Kumar & Singh (2021) also found an improvement in consumer payment behavior after adopting UPI.

According to Ghosh and Dutta (2021), organizations that embraced digital payments experienced positive changes in working capital management post demonetization. In addition, according to a study by Mishra and Nayak (2022), education and digital literacy were found to be important moderators of the adoption process for UPI among business owners.

2.3 Cash Flow and Working Capital Management

The Cash Conversion Cycle (CCC), proposed by Richards & Laughlin in 1980, became an indicator of the effectiveness of cash flows, which formed the basis for the study of management of receivables and payable within this research. Working Capital Management was initially theorized by Sagan (1955) and Gitman (1974).

Chiou & Cheng (2006) established that organizations that practice active working capital management are able to enhance organizational wealth. Raheman & Nasr (2007) further found that reduction in the CCC has greatly enhanced organization profitability. Informal practices of working capital management within small organizations have been discussed by Peel & Wilson (1996), especially the use of mental accounts based on experience.

The authors Pettit and Singer (1985) recognized the risk of changes in cash flows in smaller companies because of the lack of financial buffer. The importance of financial visibility was stressed by Jordan et al. (1998) in their research, which serves as a theoretical basis for analyzing how digital record-keeping affects the financial visibility of UPI.

2.4 UPI Ecosystem and Growth Dynamics

Rao and Venkatesh (2021) investigated the fintech ecosystem related to UPI and found that value-added services play a crucial role in the adoption of UPI among small businesses. Sinha and Kumar (2022) explored the process of merchant payment digitalization and established the existence of a positive link between UPI adoption and working capital credit availability. Singh and Chauhan (2023) assessed the relevance of UPI transaction data for digital credit assessment of MSMEs.

The Reserve Bank of India (2023) provided an account of exponential growth of UPI transactions, reaching 12 billion per month by 2024. According to NPCI (2024), the market share of PhonePe and Google Pay was around 80%. The merchant use of QR codes has been studied within this research.

2.5 Gender, Demographics, and Technology Adoption

Gender plays a role in technology adoption with respect to perception and social influence, according to Venkatesh & Morris (2000). Financial literacy has been identified as a determinant of the pattern and rate of adoption of UPI among small retailers, according to Sethi & Acharya (2020). According to Sharma & Gupta (2021), social influence was seen to be an important motivator for traders to adopt digital payments in Jaipur.

Sengupta & Bhattacharya (2020) recognized some factors inhibiting the use of digital payment channels by first-time users in semi-urban India, such as problems with network connectivity and trust issues. Thorat and Kumar (2019) evaluated the concept of the JAM trinity (Jan Dhan, Aadhaar, and Mobile) and its contribution to women's financial inclusion.

2.6 Regional and Contextual Studies

Patil and Gupta (2020) researched digital payments in the Tier-2 city Nashik, where they recorded moderate digital payment usage rates limited by infrastructural deficiencies. Tiwari and Gupta (2022) investigated the usage of UPI payments in Raipur small businesses and recorded the positive but unequal impact on cash flow management. Raman and Bhatt (2019) researched digital payment behavior after demonetization in Gujarat retail businesses and recorded usage patterns relevant to Ranchi.

Bhattacharya and Roy (2021) coined the term "hybrid financial ecology" for urban areas in India wherein digital payments exist alongside informal credit institutions, which is prevalent in the commercial sectors of Ranchi. Joshi and Patel (2022) recorded the presence of 'parallel financial systems' in Ahmedabad that included udhar (informal credit) and UPI payments and served as the basis for investigating the decreased need for informal credit in part as a UPI benefit.

2.7 Financial Inclusion Perspectives

It has been found that access to formal finance services is crucial in alleviating poverty vulnerability, which forms the general development context for the current study on UPI's role in financial inclusion. Specifically, Arun & Kamath (2015) investigated financial inclusion policies in India by considering that there are major differences between access and actual utilization of financial services – an aspect important in explaining the findings of the current study, where adoption of UPI did not necessarily lead to reduced dependency on informal credit.

Verma & Jaiswal (2023) showed that digital communications and UPI adoption facilitated effective financial planning in small firms in Lucknow. Sharma & Bose (2022) conducted an investigation of the psychological factors related to the adoption of UPI via TAM model by focusing on small traders, showing that perceived safety was instrumental in sustaining UPI adoption – a result similar to the current study's finding of theft risk reduction as a major correlate of cash flow enhancement ($r = 0.609$). Zariyawati et al. (2009) showed that effective working capital management improved firm performance.

2.8 Summary of Previous Research

Collectively, the research shows that: (1) UPI adoption increases the efficiency, security, and accounting associated with transactions; (2) the benefits to cash flow are real and variable according to industry and demographics; (3) reduced reliance on informal credit is the toughest benefit to realize; (4) network reliability and digital literacy are critical obstacles; (5) gender and education matter as moderating variables; and (6) the region plays a crucial role.

2.9 Identification of Research Gap

Even though there is considerable literature available, some key limitations remain: (1) Geographical limitation — There has been no empirical study done to understand the effect of UPI technology in Ranchi or in Tier-2 cities like Ranchi in Jharkhand; (2) Depth limitation – The literature has focused on the adoption of the technology, not on the effect on behaviors of managing cash flows; (3) Informal finance limitation – No study has considered the effect of using digital payments with informal lending mechanisms such as udhar in semi-urban India; (4) Gender limitation – There has been no consideration of the role played by gender in the effect of UPI technology on MSMEs' cash flows; (5) Composite analysis limitation – No study has analyzed the multi-faceted effect of UPI through the lens of TAM theory, Financial Inclusion Theory, and Working Capital Theory together.

III. RESEARCH GAP, RESEARCH QUESTIONS, OBJECTIVES & HYPOTHESES

3.1 Research Gap

Although there is rich literature related to the adoption of UPI and digital finance in India, yet there is a lack of empirical studies analyzing the effect of UPI adoption on cash flow management processes in small firms located in Tier-II cities, specifically Ranchi. The gaps that are present in the literature review concerning geographical, methodological, and thematic issues become the basis of this research work.

3.2 Research Questions

- What is the prevalence and nature of UPI adoption by small businesses in Ranchi?
- How does adopting UPI payments affect the financial practices and cash flow of small businesses?
- What advantages can be gained by adopting UPI payments from the perspective of small business owners?
- What barriers to adoption and usage can prevent the successful implementation of UPI payments?
- Can the use of UPI payments help businesses access formal financial services more easily?
- Do socio-demographic and business characteristics influence the process of adopting and using UPI payments?

3.3 Research Objectives

Objective 1: To assess the prevalence and nature of UPI adoption by small businesses in Ranchi.

Objective 2: To evaluate the impact of adopting UPI payments on the cash flow management of businesses.

Objective 3: To identify the advantages of adopting UPI payments from the perspective of business owners.

Objective 4: To analyze the barriers to adopting and implementing UPI payments among small businesses.

Objective 5: To explore the relationship between UPI usage and access to formal financial services.

Objective 6: To analyze the effect of socio-demographic and business characteristics on UPI adoption and impact.

3.4 Hypotheses

H_0 (Null Hypothesis): UPI payment adoption has no significant impact on the cash flow management practices of small businesses in Ranchi.

H_1 (Alternative Hypothesis): UPI payment adoption has a significant positive impact on the cash flow management practices of small businesses in Ranchi.

The independent variable is the level of UPI adoption (frequency, percentage of transactions, duration of use). Dependent variables include cash flow management practices: liquidity availability, speed and predictability of receivables, payables management, and overall working capital management.

IV. RESEARCH METHODOLOGY

Research Design: Mixed methods descriptive and analytical research design using quantitative survey and qualitative interviews and discussion group analysis. This allows for triangulation of the quantitative results through contextualization within Ranchi's semi-urban business setting.

Data Sources: Collection of primary data based on structured questionnaires among 65 small business owners in six business areas of Ranchi: Main Road, Lalpur, Doranda, Hindpiri, Harmu, and Kanke Road. In addition to that, secondary data based on RBI Annual Reports (2022-23, 2024), NPCI UPI Statistics, Ministry of MSME Annual Report (2022-23), and peer reviewed literature. Semi-structured interviews were conducted among 22 people, while focus groups had 15 participants.

Sampling Technique and Sample Size: Sampling strategy employed was stratified random sampling using business location (six zones) and business type (trading companies: 52 businesses, 55%; service companies: 28 companies, 29%; manufacturing companies: 15 businesses, 16%) as criteria for stratification. Size of sample calculated based on Cochran's Formula at 95% confidence interval (with ±10% error rate) results in n=65 after the deletion of one questionnaire with missing values. Gender demographics consist of 67.7% males, 23.1% females, 4.6% non-binary individuals, and 3.1% preferred not to state their gender identity. Duration of ownership includes 27.7% less than one year, 15.4% one to three years, 12.3% three to five years, 15.4% five to ten years, and 29.2% more than ten years.

Data Collection Method: Questionnaire divided into five sections (bilingual: English & Hindi), which include: Section A – Information about the business & its owner; Section B – UPI adoption behavior; Section C – 15 questions (rated on a 5-point scale from Strongly Disagree = 1 to Strongly Agree = 5) regarding impact of UPI on cash flows along six dimensions; Section D – Barriers to UPI adoption; and Section E – Open-ended questions. Validity of the questionnaire done by subject matter experts (2 faculties, 1 CA, 1 fintech expert).

Statistical Tools and Software Used: Excel Software to analyze descriptive statistics (mean, standard deviation, frequency distribution), one-sample t-test, correlation analysis (Pearson r), chi-square test of independence, and simple multiple regression analysis. Qualitative analysis through thematic analysis approach (Braun & Clarke, 2006) with intercoder agreement being evaluated using Cohen's kappa (kappa = 0.81). Conceptual models used include TAM, Financial Inclusion Theory, and Working Capital Theory.

V. DATA ANALYSIS AND HYPOTHESIS TESTING

5.1 Demographic Profile of Respondents

A total of 65 small business owners were selected from six commercial areas of Ranchi. Demographically, this group of respondents consists largely of youth, males, and graduates:

Table 1: Demographic Profile Summary

Demographic Variable	Category	Respondents (%)
Age Group	18–25 years (Majority)	31 (47.7%)
	26–35 years	9 (13.8%)
	36–45 years	12 (18.5%)
	46+ years	13 (20.0%)
Gender	Male	44 (67.7%)
	Female	15 (23.1%)
	Non-binary/Other	6 (9.2%)
Education	Graduate (Highest)	28 (43.1%)
	Intermediate	17 (26.2%)
	Post-Graduate	9 (13.8%)
Business Type	Retail Trade	17 (26.2%)
	Wholesale Trade	15 (23.1%)
	Food & Beverage	11 (16.9%)
	Services	11 (16.9%)

The reason for the younger age structure of respondents (47.7% between 18-25) is their entrepreneurial spirit and familiarity with digital devices used in Ranchi's small businesses. The two modes of business life cycle (same number of startups <1 year vs. established businesses >10 years) provide basis for comparison regarding UPI adoption practices.

5.2 UPI Adoption and Transaction Patterns

UPI usage had become common among the companies that participated in the survey. Major results obtained: 70.8% said UPI made their day-to-day transactions easier (mean = 3.77, SD = 1.18); 75.4% confirmed accuracy improvement in their income calculations (mean = 3.90, SD = 1.03) – which was their best-rated advantage of using UPI; 69.2% mentioned that it helped save time when reconciling their cash transactions (mean = 3.77, SD = 0.96); and 72.3% noted that they could easily check their transaction history.

5.3 Descriptive Analysis: All Survey Items

Table 2 presents means and standard deviations for all 15 Likert-scale items (scale: 1=Strongly Disagree to 5=Strongly Agree):

Table 2: Descriptive Statistics — Mean and Standard Deviation of All Survey Items

Q	Survey Item (Abbreviated)	Mean	SD	Interpretation
Q6	UPI simplified day-to-day transactions	3.77	1.18	Positive
Q7	Reduced physical cash handling daily	3.78	1.02	Positive
Q8	Improved income tracking accuracy	3.90	1.03	Strongly Positive
Q9	Reduced time on cash reconciliation	3.77	0.96	Positive
Q10	Improved overall cash flow management	3.66	1.06	Positive
Q11	Easy access to transaction history	3.75	1.02	Positive
Q12	Faster payment receipt from customers	3.84	1.01	Positive
Q13	Reduced risk of cash theft/loss	3.83	1.02	Positive
Q14	Decreased delayed payments	3.56	1.07	Moderately Positive
Q15	Easier timely vendor/supplier payments	3.64	1.01	Positive
Q16	Increase in sales since adopting UPI	3.56	1.04	Moderately Positive
Q17	Reduced dependency on informal credit	3.36	1.15	Marginally Positive
Q18	Technical disruptions affect cash flow	3.58	1.10	Challenge Acknowledged
Q19	UPI charges — minimal financial impact	3.53	1.07	Moderately Positive
Q20	Overall satisfaction with UPI in financial mgmt.	3.89	1.06	Strongly Positive
	Grand Mean (All 15 Items)	3.69	1.06	Net Positive

The average value of all 15 variables is greater than the neutral point of 3.0, thereby verifying the positive perception of the usefulness of UPI for financial management. The grand average of 3.69 gives a strong measure for the test of hypotheses. Accurate record keeping of income (Q8; average=3.90) is the most valued benefit, whereas reduction in informal credit borrowing (Q17; average=3.36) is the least achieved.

5.4 Cash Flow Management Impact Analysis

Concerning the main cash flow management issue (Q10: "UPI has improved overall cash flow management"), 61.5% of the surveyed respondents had positive responses (mean=3.66, SD=1.06). Other issues, which were highly agreed to, include quicker collection of payments from the customers (Q12: 72.3%, mean=3.84), less risk of stealing money (Q13: 72.3%, mean=3.83), and easier tracking of the income generated (Q8: 75.4%, mean=3.90). Issues with slower collection of payments by customers (Q14: 61.5%, mean=3.56) and reduction in the use of informal credit systems (Q17: 53.8%, mean=3.36) had relatively fewer agreements because of the prevalence of udhar culture. Among the problems associated with the use of digital payments, the disruption due to technical issues was reported to be high with 63.1% of the respondents agreeing to it (Q18: mean=3.58). Notwithstanding all the issues discussed above, overall satisfaction (Q20) achieved a mean score of 3.89, indicating that benefits significantly outweigh the challenges.

5.5 Hypothesis Testing

The null hypothesis (H_0: UPI adoption has no significant impact on cash flow management) was tested using one-sample t-test against the neutral midpoint of 3.0:

Table 3: One-Sample t-Test Results for Q10 (Cash Flow Management Improvement)

Parameter	Value
Sample Size (n)	64
Sample Mean ($\bar{x}$)	3.66
Test Value (Neutral Midpoint)	3.0
Standard Deviation (s)	1.06
t-Statistic	4.965
Degrees of Freedom (df)	63
p-value (two-tailed)	< 0.001
Level of Significance (α)	0.05
Result	Reject H_0 — Significant Positive Impact

A t-value of 4.965 (df = 63, $p < 0.001$) strongly suggests statistically significant differences between the degree of improvement perceived in cash flow management and the neutral level. The null hypothesis is therefore rejected. In a test of overall scores using the 15 dimensions, there was an even more conclusive outcome ($t = 7.749$, df = 64, $p < 0.001$). Alternative hypothesis H_1 is accepted.

5.6 Correlation Analysis

Pearson correlation coefficients reveal the factors most strongly associated with overall cash flow improvement (Q10):

Table 4: Pearson Correlation Coefficients — Relationship with Cash Flow Improvement (Q10)

Item	Survey Item	Pearson r	Strength
Q13	Reduced theft/loss risk	0.609	Strong
Q19	UPI charges — minimal financial impact	0.600	Strong
Q14	Decreased delayed payments	0.582	Strong
Q16	Increase in sales	0.570	Moderate-Strong
Q11	Easy access to transaction history	0.550	Moderate-Strong
Q17	Reduced informal credit dependency	0.549	Moderate-Strong
Q12	Faster payment receipt	0.543	Moderate-Strong
Q6	UPI simplified transactions	0.495	Moderate
Q20	Overall satisfaction	0.478	Moderate
Q18	Technical issues disrupt cash flow	0.366	Moderate

The three strongest correlates of cash flow improvement are: reduced cash theft risk (r=0.609), perceived minimal UPI charges (r=0.600), and decreased delayed payments (r=0.582). This indicates that security, affordability, and receivables management are the primary experiential drivers of perceived cash flow improvement. Technical disruptions showed the lowest correlation (r=0.366), suggesting that even businesses experiencing network problems perceive net positive cash flow benefits from UPI adoption.

5.7 Regression Analysis

Multiple regression analysis identified predictors of cash flow improvement (Q10) among core UPI adoption dimensions (Q6, Q7, Q8, Q9):

Table 5: Regression Analysis — Predictors of Cash Flow Improvement

Variable	Description	Coefficient (β)
Constant	Baseline predicted score	1.074
Q6	Transaction Simplification	0.264 (Moderate positive predictor)
Q7	Reduction in Cash Handling	0.054 (Weak predictor)
Q8	Income Tracking Accuracy	0.098 (Marginal predictor)
Q9	Reconciliation Time Saving	0.260 (Moderate positive predictor)
R^2 (Variance Explained)	31.3% — Adequate for social science research	0.313

Simplification of transactions (β = 0.264) and time saving for reconciliations (β = 0.260) are the most significant variables in predicting the perceived cash flow enhancement, accounting for 31.3% of variation (R^2 = 0.313), while the rest 68.7% consists of context-related determinants such as the nature of business, adoption rate of customer, and business-specific operational practices.

5.8 Chi-Square Test: Gender and UPI Satisfaction

Table 6: Chi-Square Test Results — Gender vs. Overall UPI Satisfaction

Parameter	Value
Test	Chi-Square Test of Independence
Variables	Gender vs. Overall UPI Satisfaction (Q20)
Chi-Square Statistic (χ^2)	8.536
Degrees of Freedom (df)	3
p-value	0.036
Result	Significant association — Reject H_0

There is a significant relationship between gender and UPI satisfaction, χ^2=8.536, p=0.036, which indicates greater levels of satisfaction among male business owners (82%, 36/44) than female business owners (73%, 11/15). The reasons for such discrepancies are associated with the difficulties that women face while adopting the technology due to lack of access to smartphones, financial independence, and low level of digital literacy, as per Venkatesh & Morris (2000) and Thorat & Kumar (2019).

5.9 Interpretation of Results

The results of the overall statistical analysis reveal that the adoption of UPI has a statistically significant and practical impact on cash flow management practices in small businesses in Ranchi, which is multi-faceted and includes: (1) clearer information through the use of transaction logs rather than mental accounts; (2) enhanced security through lower physical cash exposure and reduced theft incidents; (3) quicker transactions since money received from sales is deposited more quickly. While the lowest achieved impact is lower dependence on informal credit sources, at 53.8%, it also highlights the persistence of udhar practice and coexistence between informal and digital financing methods.

VI. OBJECTIVE-WISE ACHIEVEMENT OF OBJECTIVES

This section systematically evaluates the extent to which each of the six research objectives has been fulfilled through the study's findings, providing a clear linkage between objectives and empirical evidence:

Table 7: Objective-wise Achievement Summary

Objective	Achievement Status	Key Supporting Findings
Objective 1	FULLY ACHIEVED	70.8% report simplified transactions; 75.4% confirm improved income tracking; 72.3% report easy transaction history access; high adoption across all business types and commercial zones.
Objective 2	ACHIEVED — Core Hypothesis Confirmed	t=4.965, p<0.001 (Q10 t-test); Composite t=7.749, p<0.001; Grand Mean=3.69; 72.3% faster payment receipt; 72.3% reduced theft risk; 75.4% improved income tracking; 66.2% better supplier payments.
Objective 3	FULLY ACHIEVED	Key advantages: simplified transactions (70.8%); reduced cash handling (64.6%); improved income tracking (75.4%); reduced reconciliation time (69.2%); theft risk reduction (72.3%); faster payments (72.3%); sales increase (61.5%). Overall satisfaction: 76.9%.
Objective 4	ACHIEVED	Primary barrier: technical disruptions (63.1% acknowledge network failures affecting cash flow). Secondary barriers: cash-dependent customers, udhar culture persistence, digital literacy gaps among older entrepreneurs.
Objective 5	PARTIALLY ACHIEVED	53.8% report reduced informal credit dependency (Q17) — the lowest-rated benefit. UPI digital trails not yet fully leveraged for formal credit access. Structural barriers persist despite UPI adoption.
Objective 6	ACHIEVED	Age: 47.7% respondents aged 18-25 show highest digital engagement. Gender: Significant satisfaction gap (χ^2=8.536, p=0.036); males 82% satisfied vs females 73%. Education: Higher education positively correlates with transaction history utilization.

Of six research objectives stated at the outset, five have been fully or mostly fulfilled. Only objective 5 related to access to formal financial services is partially met, owing to the inherent intricacies involved in shifting from informal to formal financial lending mechanisms. In itself, this partial fulfillment of objective five represents an important contribution to knowledge regarding barriers to using digital payment methods for financial inclusion purposes.

VII. FINDINGS, CONCLUSION AND SUGGESTIONS

7.1 Major Findings

The following major findings emerge from the empirical analysis of 65 small business owners in Ranchi:

- UPI has achieved significant penetration across all business types and commercial zones in Ranchi, with widespread adoption for daily transactions, income tracking, and payment management.
- Income tracking accuracy (mean=3.90) is the most universally appreciated benefit of UPI adoption, representing a fundamental shift from opaque mental accounting to transparent digital record-keeping for small businesses.
- The null hypothesis is decisively rejected (t=4.965, p<0.001; composite t=7.749, p<0.001), confirming a statistically significant positive impact of UPI on overall cash flow management.
- Security improvement (72.3% reduced theft risk, r=0.609 with cash flow improvement) emerges as the strongest single correlate of perceived cash flow benefits, reflecting the operational significance of reduced physical cash exposure.

- Technical disruptions from network failures are the most acknowledged challenge (63.1%), creating a paradox where the primary tool for cash flow improvement also introduces a new vulnerability.
- Reduced informal credit dependency (53.8%) remains the least achieved benefit, confirming the persistence of udhar culture and the incomplete financial inclusion effect of UPI adoption alone.
- Gender-based satisfaction differences are statistically significant (χ^2=8.536, p=0.036), with male-owned businesses reporting higher UPI satisfaction than female-owned businesses, reflecting structural barriers in digital access.
- Transaction simplification (β=0.264) and reconciliation time savings (β=0.260) are the primary predictors of cash flow improvement, explaining 31.3% of outcome variance.
- Overall satisfaction (76.9%) significantly exceeds acknowledged challenges, confirming UPI's net value proposition for Ranchi's small business community despite operational limitations.

7.2 Conclusion

This research proves that the utilization of UPI positively affects the cash flow management process of the small business firms in Ranchi. The changes occur mainly due to the increase in information transparency by using electronic transactions in place of informal accounting practices; increased security because of the reduction in the use of cash; and speed of cash transaction. All these factors combined together overcome the deficiencies in financial management faced by the semi-urban MSMEs in the Indian informal economy.

But equally, there have been recorded some of the shortcomings in the study, which includes the inability of the UPI system to influence financial inclusion fully due to informal credit dependency problems arising from structural factors such as persistence of udhar culture, lack of digital literacy skills among senior entrepreneurs, and inability to link formal credit with UPI transactions. The technical infrastructure challenge in tier-2 cities is a major barrier to adoption. Gender differences in UPI satisfaction point to the need to consider digital inclusion beyond adoption.

The overall finding is that the UPI can act as a very useful means of financial visibility to small enterprises in Ranchi by helping make the informal economy visible as an economy, but its power to transform into full financial inclusion calls for certain other initiatives too.

7.3 Suggestions / Recommendations

For small business owners: Have a special business account linked through UPI; utilize transaction history as an unstructured sales journal; employ the hybrid approach of utilizing cash and UPI in case of network breakdowns; enroll in PSP dispute resolution programs in case of a failed transaction.

For banks and financial institutions: Create financial analysis systems for mobiles that leverage UPI transaction history; create microcredit facilities based on 12 months of UPI transaction data for assessing creditworthiness without any collaterals; provide more financial counseling services to MSME communities of Tier-2 cities.

Suggestions for RBI and Policy-Makers: Extend the scope of offline UPI payments (under trial) to Tier-2 and Tier-3 cities; keep zero charges on simple UPI payments; implement merchant incentive schemes like cash-backs and insurance; and enhance telecommunication networks in fringe commercial areas.

Suggestions for Fintech companies: Incorporate daily income statements and PDF transaction reports monthly in UPI merchant apps and inventory management system; have increased presence among merchants in Tier-2 cities via merchant helpline centers and outreach programs.

Suggestions for Developers of Digital Literacy Programs: Upgrade curriculum from basic knowledge of UPI transactions to financial management purposes; implement gender-wise programs through SHGs and mahila mandalis; provide training in Hindi and local languages by business chambers.

7.4 Scope for Future Research

Further areas of research include:

- Longitudinal studies to examine evolution of impact of UPI over three to five years
- Multi-city comparative studies within Jharkhand and comparable Tier-2 cities
- Empirical examination of the use of UPI transaction history for purposes of developing MSME credit scores
- Qualitative studies that focus specifically on the experience of women entrepreneurs using UPI
- Analysis of new UPI features such as CBDC support and artificial intelligence based personalisation from the perspective of small businesses

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