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Influence of UPI Payment System Usage on Customer Perception

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Abstract: *The Unified Payments Interface (UPI), launched by the National Payments Corporation of India (NPCI) in 2016, has emerged as one of the most extensively adopted real-time payment platforms globally. This study investigates the influence of UPI payment system usage on customer perception, with specific focus on dimensions including frequency of use, preferred applications, transactional purpose, satisfaction with service speed, encountered challenges, and the resultant shift away from cash dependence.*

Employing a descriptive, primary survey-based research design, data were collected from 100 respondents in Pune, Maharashtra. Findings reveal that 68% of respondents use UPI daily, Google Pay and PhonePe are the most widely preferred platforms, and bill payments and money transfers constitute the dominant transactional purposes. While 78% reported satisfaction or very high satisfaction with transaction speed, approximately 67% reported experiencing at least one operational issue, most commonly network disruptions and transaction failures. Critically, 65% agreed or strongly agreed that UPI usage has reduced their dependence on physical cash.

The study concludes that UPI has significantly and positively shaped customer perception, though persistent technical concerns and digital literacy gaps continue to impede universal adoption. The findings carry practical implications for fintech developers, policymakers, and banking institutions seeking to enhance digital payment infrastructure in India..

Keywords: Unified Payments Interface (UPI), Digital Payments, Customer Perception, Mobile Payments, Cashless Transactions, Technology Acceptance Model, Consumer Behaviour

I. INTRODUCTION

The digital revolution has significantly altered the global financial landscape, leading to widespread adoption of electronic payment systems. In India, the launch of UPI by NPCI in 2016 marked a pivotal milestone in the nation's transition toward a cashless economy. UPI enables users to transfer money instantly between bank accounts using smartphones, eliminating the need for traditional banking procedures such as entering account details or visiting physical bank branches.

Increasing smartphone penetration, affordable internet connectivity, and government initiatives promoting digital payments have accelerated UPI adoption across diverse demographic groups. UPI facilitates retail purchases, utility bill payments, peer-to-peer transfers, and online service subscriptions. Per NPCI data, UPI processed over 117 billion transactions in FY 2023–24, reflecting its entrenchment as the primary mode of retail digital payment [4]. The IMF recognised UPI as the world's largest retail fast-payment system by transaction volume, representing approximately 49% of global real-time transactions [2].

This widespread adoption has reshaped customer perceptions of payment systems in terms of convenience, reliability, and security. Positive perceptions encourage continued usage and loyalty, while negative experiences may deter adoption [9]. This study provides a comprehensive analysis of how UPI usage shapes customer perception, drawing on primary survey data from 100 respondents in Pune, Maharashtra, grounded in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) [9].

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II. BACKGROUND OF THE STUDY

Historically, India was a heavily cash-reliant economy due to limited banking penetration and low digital literacy. The demonetisation initiative in November 2016 served as a decisive policy catalyst, compelling millions of citizens to adopt digital wallets and UPI as alternatives to physical cash [17]. UPI emerged as an interoperable, real-time payment infrastructure consolidating multiple bank accounts within a single mobile application through Virtual Payment Addresses (VPAs), with a zero-cost transaction model and round-the-clock availability distinguishing it from earlier instruments such as NEFT, RTGS, and mobile wallets.

The COVID-19 pandemic further accelerated UPI adoption, as consumer preferences shifted toward contactless payment solutions [18]. The system's reach extended to Tier 2 and Tier 3 cities with increasing merchant, small business, and rural consumer adoption [5]. Despite this growth, challenges related to network reliability, transaction failure rates, security vulnerabilities, and digital literacy gaps continue to affect user experience and perception [12][13].

III. STATEMENT OF THE PROBLEM

Despite UPI's exponential growth, a significant empirical gap exists in understanding how increasing usage frequency shapes customer perception across different transactional dimensions. Existing literature predominantly focuses on the technology adoption phase — perceived usefulness, ease of use, and behavioural intention at the point of initial adoption [9]. However, limited research examines how sustained, habitual UPI usage across varied purposes influences evolving customer perceptions of satisfaction, trust, and cash dependency.

While macro-level studies provide aggregate adoption statistics [1][2], granular understanding of challenges encountered by regular UPI users — such as transaction failures, network disruptions, refund delays, and security concerns [12][14][16] — and their specific impact on customer perception remains insufficiently documented at the regional level. This study bridges that gap through empirical primary data from 100 respondents in Pune, Maharashtra.

IV. RESEARCH OBJECTIVES

To examine the level of awareness and frequency of usage of UPI payment systems among customers.
To analyse customer perceptions regarding ease of use, convenience, and speed of UPI payments.
To assess customer perception of security and trust in UPI transactions.
To identify the impact of UPI usage on customer satisfaction.
To analyse challenges and problems faced by customers while using UPI services.
To examine the overall influence of UPI usage on customers' payment behaviour and cash dependence.

V. RESEARCH QUESTIONS

What is the prevailing frequency of UPI usage among customers, and how does it vary across user segments?
How do customers perceive the ease of use, convenience, and transaction speed of UPI payment systems?
To what extent do perceived security and trust influence customer perception of UPI transactions?
What is the impact of UPI usage on overall customer satisfaction?
What are the most commonly encountered challenges among UPI users, and how do these affect perception?
How significantly has UPI usage influenced customers' transition away from cash-based transactions?

VI. SIGNIFICANCE OF THE STUDY

This study makes several important contributions to both academic literature and industry practice. For academic researchers, it adds to the empirical literature on digital payment adoption and customer perception in emerging economies, with specific applicability to the Indian fintech context. Primary survey data from 100 respondents provides a grounded, evidence-based perspective complementing existing secondary literature drawn from NPCI, RBI, IMF, and leading academic journals [1][2][3][4][9].

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For industry practitioners — fintech companies, commercial banks, and UPI service providers — the findings offer actionable insights into user pain points, satisfaction drivers, and behavioural shifts associated with habitual UPI use. For policymakers and regulators, particularly NPCI and the RBI, the study highlights dimensions of UPI performance that most significantly influence public trust and adoption, informing future policy interventions and digital infrastructure investment [19][20].

VII. SCOPE AND LIMITATIONS

This study is based on primary data from a structured questionnaire survey of 100 respondents in Pune, Maharashtra. The scope is confined to individual UPI users across six key dimensions: usage frequency, app preference, transactional purpose, satisfaction with speed, issues encountered, and impact on cash dependence.

Limitations include: the sample size of 100 may not be fully representative of the broader Indian UPI user population; the study is geographically limited to Pune and may not generalise to rural areas or other states [16]; self-reported data may be subject to social desirability bias; and the cross-sectional design captures a snapshot in time rather than longitudinal change in customer perception.

VIII. REVIEW OF LITERATURE

8.1 Customer Perception of Digital Payments

Research by Gupta and Arora (2020) found that users are more willing to engage with digital payments when they perceive the system as convenient, useful, and secure, directly influencing continued usage intentions [9]. Consumer perception is also shaped by demographic factors — age, gender, and residential area influence willingness to adopt UPI [10]. Young adults aged 18–35, including students and early-career professionals, represent the most frequent UPI users [6]. Women entrepreneurs and consumers emerged as a key growth segment in 2025, with 89% preferring digital methods for online purchases [7]. UPI is primarily preferred for recurring daily needs and utility bill payments, with an adoption rate of 87%, while high-value purchases continue to attract credit card usage [8].

8.2 Trust, Security, and Digital Literacy

Trust and financial literacy are critical determinants of customer perception. Users with higher digital literacy exhibit greater confidence and more favourable attitudes toward UPI payments, while rural and less-educated users often exhibit hesitancy due to fear of fraud [10]. Security risks such as phishing scams and small-value transaction frauds remain a persistent concern, particularly among elderly users [13]. Inadequate grievance redressal mechanisms for delayed refunds and failed transactions represent a significant barrier to positive perception [14]. Complex transaction flows act as deterrents for users with limited digital literacy [15], while network disruptions remain a critical barrier for approximately 31% of users who rely on cash as a backup [16].

8.3 Government Initiatives and Behavioural Shifts

Digital payment adoption has been driven by government initiatives such as Digital India and demonetisation [17], with the COVID-19 pandemic further accelerating UPI adoption [18]. Empirical evidence links higher UPI adoption to reduced demand for physical currency at national and subnational levels [3]. The Payments Infrastructure Development Fund (PIDF) has deployed millions of digital payment acceptance touchpoints across Tier-3 to Tier-6 centres [19], and the shift to UPI for government-to-citizen disbursements has reduced administrative costs and improved beneficiary satisfaction scores [20].

8.4 Theoretical Frameworks in UPI Research

The Technology Acceptance Model (TAM) and UTAUT are the most frequently applied theoretical frameworks in UPI research. Performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived trust significantly affect users' intention to adopt UPI [9]. Recent research further suggests that frequent UPI usage can alter spending behaviour and psychological attitudes toward money, as digital transactions diminish the psychological friction associated with cash expenditure (Prelec & Simester, 2001). Interoperability, Observability, and Perceived Trust have been identified as novel and statistically significant determinants of consumers' intention to use UPI [10].

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IX. THEORETICAL FRAMEWORK

9.1 Technology Acceptance Model (TAM)

Proposed by Davis (1989), TAM posits that user acceptance of an IT system is primarily determined by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In the UPI context, perceived usefulness refers to the degree to which users believe UPI enhances their payment efficiency, while perceived ease of use refers to the degree to which the UPI interface is effort-free [9]. This study applies TAM to understand how these perceptions, shaped by real usage experience, influence customer satisfaction and continued platform engagement.

9.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) extended earlier acceptance models into UTAUT, incorporating four core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions [9]. In this study, performance expectancy aligns with customer satisfaction with UPI transaction speed and reliability; effort expectancy relates to ease of UPI navigation; social influence is reflected in peer recommendations in app selection; and facilitating conditions encompass internet connectivity and device compatibility. UTAUT provides a comprehensive lens through which to interpret the survey findings and understand the multi-dimensional nature of customer perception.

X. HYPOTHESES

Based on the theoretical framework and literature review, the following hypotheses are formulated:

Hypothesis	Statement
H1	There is a significant level of awareness and frequency of usage of UPI payment systems among customers.
H2	Ease of use, convenience, and speed of UPI payments have a significant positive influence on customer perception.
H3	Perceived security and trust significantly influence customer perception of UPI transactions.
H4	UPI usage has a significant positive impact on customer satisfaction.
H5	Customers face significant challenges while using UPI payment services.
H6	UPI usage has a significant impact on customers' payment behaviour and cash dependence.

XI. RESEARCH METHODOLOGY

11.1 Research Design

This study employs a descriptive research design utilising primary data from a structured questionnaire survey. Descriptive research is appropriate as it aims to systematically describe characteristics of the UPI user population and quantify patterns in customer perception without manipulating variables. The study is cross-sectional in nature, capturing responses at a single point in time.

11.2 Data Collection

Primary data were collected through a structured Google Forms questionnaire administered to UPI users in Pune, Maharashtra between March and April 2026. The questionnaire comprised six items covering usage frequency, app preference, transactional purpose, satisfaction with transaction speed, problems encountered, and perceived impact on cash dependence, yielding 100 complete responses. Secondary data were drawn from published reports by NPCI, RBI, IMF, World Bank, and peer-reviewed academic journals [1]–[20].

11.3 Sampling

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A convenience sampling methodology was employed, targeting individuals who actively use UPI for digital transactions. The sample of 100 respondents was drawn from urban and semi-urban Pune, encompassing students, working professionals, and self-employed individuals.

11.4 Variables

Independent Variables: Frequency of UPI use, preferred UPI application, transactional purpose, issues encountered.

Dependent Variable: Customer perception of UPI, assessed via satisfaction with transaction speed and reduction in cash dependence.

11.5 Data Analysis Tools

Collected data were tabulated and analysed using Microsoft Excel. Frequency distribution analysis was performed for each survey question and results are presented as count-based tables with percentage analysis. Findings are interpreted in context of the study's hypotheses and theoretical framework.

XII. DATA ANALYSIS AND INTERPRETATION

This section presents a systematic analysis of primary survey data from 100 respondents, with frequency and percentage distributions interpreted in relation to the study's objectives and hypotheses.

12.1 Frequency of UPI Usage

Frequency of Usage	Number of Respondents	Percentage (%)
Daily	68	68%
Weekly	20	20%
Monthly	6	6%
Rarely	6	6%
Total	100	100%

Table 12.1: Frequency of UPI Usage among Respondents

68% of respondents use UPI daily, indicating deeply embedded habitual adoption. A further 20% use UPI weekly, bringing frequent users (daily + weekly) to 88%. Only 12% use UPI monthly or rarely. This finding supports H1 and is consistent with national trends indicating UPI accounted for over 75% of all retail digital payments in India as of 2024 [1], confirming its status as the predominant mode of everyday retail payment.

12.2 Preferred UPI Applications

UPI Application(s) Used	Number of Respondents	Percentage (%)
Google Pay (only)	17	17%
PhonePe (only)	11	11%
Paytm (only)	10	10%
Google Pay & PhonePe	9	9%
Multiple apps (3 or more)	16	16%
BHIM (only)	5	5%

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Others / Combinations	32	32%
Total	100	100%

Table 12.2: Preferred UPI Applications among Respondents

Google Pay is the single most preferred UPI application (17%), followed by PhonePe (11%) and Paytm (10%). A notable 52% of respondents use two or more UPI applications simultaneously, reflecting UPI's interoperable architecture and users' tendency to leverage multiple platforms based on merchant acceptance, cashback offers, and interface preference. BHIM accounts for only 5% of sole-app users. This supports H2 regarding ease of use and convenience as key drivers of app selection [4].

12.3 Purpose of UPI Usage

Primary Purpose	Number of Respondents	Percentage (%)
Bill Payments	41	41%
Money Transfer	22	22%
Shopping	20	20%
Online Services	13	13%
Others	4	4%
Total	100	100%

Table 12.3: Primary Purpose of UPI Usage

Bill payments constitute the most common transactional purpose (41%), followed by money transfer (22%) and shopping (20%) — together accounting for 83% of UPI usage. Online services (13%) represent a growing use case. The dominance of utility-oriented transactions indicates customers primarily perceive UPI as a practical, functional tool, reinforcing the performance expectancy dimension of UTAUT and aligned with industry findings that UPI is preferred for recurring daily needs [8].

12.4 Satisfaction with UPI Transaction Speed

Satisfaction Level	Number of Respondents	Percentage (%)
Very Satisfied	49	49%
Satisfied	29	29%
Neutral	7	7%
Dissatisfied	15	15%
Total	100	100%

Table 12.4: Satisfaction with UPI Transaction Speed

78% of respondents are satisfied (29%) or very satisfied (49%) with UPI transaction speed, reflecting strong positive perception of the platform's core functional attribute and supporting H4. However, 15% expressed dissatisfaction, likely attributable to network congestion or server unavailability [12], highlighting service reliability as an area requiring improvement.

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12.5 Issues Encountered While Using UPI

Issue Encountered	Number of Respondents	Percentage (%)
No Issues	33	33%
Network Issues	26	26%
Transaction Failure	19	19%
Delay in Refund	10	10%
Security Concerns	8	8%
Server Downtime	4	4%
Total	100	100%

Table 12.5: Issues Encountered While Using UPI

Approximately 67% of respondents reported experiencing at least one operational issue. Network issues (26%) and transaction failures (19%) together account for 45% of all respondents. Refund delays (10%) and security concerns (8%) also carry significant implications for long-term trust. Only 33% reported no issues, strongly supporting H5 and consistent with literature identifying technical issues as major factors negatively impacting user trust [12][13][14].

12.6 Impact of UPI Usage on Cash Dependence

Response	Number of Respondents	Percentage (%)
Strongly Agree	9	9%
Agree	56	56%
Neutral	25	25%
Disagree	9	9%
Strongly Disagree	1	1%
Total	100	100%

Table 12.6: Impact of UPI Usage on Cash Dependence

A combined 65% agreed or strongly agreed that UPI usage has reduced their dependence on physical cash, indicating a significant behavioural shift. A further 25% expressed a neutral view. Only 10% disagreed or strongly disagreed, likely representing individuals for whom UPI supplements rather than replaces cash. This strongly supports H6 and is consistent with RBI data linking higher UPI adoption to reduced demand for physical currency [3][11].

XIII. HYPOTHESIS TESTING SUMMARY

To validate the study's hypotheses, percentage-based significance testing was applied to the primary data. The table below summarises outcomes based on survey findings.

Hypothesis	Test Finding	Result
H1	68% daily usage; 88% use UPI at least weekly [1]	Supported
H2	Google Pay & PhonePe dominate; 52% use multi-apps [4]	Supported

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H3	8% security concerns; 10% refund delays reduce trust [13][14]	Supported
H4	78% satisfied or very satisfied with transaction speed [9]	Supported
H5	67% faced at least one issue; network & failure dominant [12]	Supported
H6	65% agreed UPI has reduced dependence on physical cash [3]	Supported

Table 13.1: Summary of Hypothesis Testing Results

All six hypotheses are supported. The findings confirm that UPI has achieved deep penetration [1], delivers on its core functional promise [9], but faces persistent operational challenges [12][13][14] that must be addressed to achieve universal positive perception.

XIV. FINDINGS

The primary findings of this study are summarised below:

UPI usage is predominantly habitual, with 68% of respondents using the platform daily and 88% at least weekly, indicating deep integration into everyday financial behaviour [1][4].

Google Pay is the most widely used UPI application, followed by PhonePe and Paytm. A significant 52% of users use multiple UPI applications simultaneously, reflecting the interoperable and competitive nature of the ecosystem.

Bill payments constitute the most common transactional purpose (41%), followed by money transfers (22%) and shopping (20%), indicating UPI is perceived primarily as a utility-oriented payment tool [8].

78% of respondents are satisfied or very satisfied with UPI transaction speed, affirming the platform's core value proposition. However, 15% expressed dissatisfaction, highlighting service reliability as an area for improvement [12].

67% of respondents encountered at least one operational issue, with network disruptions (26%) and transaction failures (19%) the most prevalent — representing significant barriers to universal positive perception [12][13][14].

UPI usage has contributed to a meaningful reduction in cash dependence for 65% of respondents, confirming the platform's role in accelerating India's cashless economy transition [3][11].

XV. DISCUSSION

The findings of this study are broadly consistent with and extend the existing literature on digital payment adoption in India. The high daily usage rate (68%) aligns with NPCI's published data on UPI transaction volumes [1] and confirms habitual adoption among the sampled population, moving beyond the trial phase typically examined in adoption studies.

The dominance of Google Pay and PhonePe over government-promoted BHIM reflects the role of user interface quality, merchant acceptance, and incentive programmes in shaping platform preference. This is consistent with the effort expectancy and social influence constructs of UTAUT, and the finding that 52% of users engage with multiple UPI apps underscores UPI's interoperable architecture as a systemic advantage [4].

The high satisfaction with transaction speed (78%) validates the TAM construct of perceived usefulness [9]. Nevertheless, the 67% issue encounter rate reveals that operational reliability remains an unresolved challenge. Network infrastructure limitations during peak transaction periods continue to undermine the otherwise positive user experience [12]. Security concerns, while reported by only 8%, carry disproportionate weight in shaping long-term trust, as even isolated fraud incidents can significantly damage platform credibility [13].

The finding that 65% of respondents have reduced cash dependence is particularly significant from a macroeconomic and policy perspective, suggesting UPI has been effective as a behavioural change mechanism consistent with India's Digital India objectives [17][18]. However, the 25% neutral response indicates that hybrid payment behaviour persists in Indian urban markets, consistent with literature noting that network disruptions remain a critical barrier for approximately 31% of users who continue to rely on cash as a backup [16].

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XVI. CONCLUSION

This study empirically demonstrates that UPI payment system usage has a significant and predominantly positive influence on customer perception. Habitual UPI adoption is firmly established among the sampled population, with the platform delivering high satisfaction across its core functional attributes of speed, convenience, and accessibility. The shift away from cash dependence among 65% of respondents affirms UPI's success as a behavioural change catalyst in India's digital financial ecosystem, consistent with macroeconomic data from the RBI and NPCI [1][2][3].

However, the study equally highlights persistent operational challenges — particularly network reliability, transaction failures, and refund processing delays — that continue to generate negative perceptions among a meaningful minority of users. Addressing these gaps is essential to sustain UPI's growth trajectory and extend its benefits to underserved populations, including rural users and those with limited digital literacy [15][16].

In conclusion, UPI represents a transformative infrastructure innovation whose full potential for reshaping customer perception and payment behaviour in India will only be realised through continuous investment in technical reliability, security, and consumer education. All six hypotheses are supported, confirming that UPI has meaningfully influenced payment behaviour and perception among customers in Pune, Maharashtra.

XVII. RECOMMENDATIONS

For UPI Service Providers and Fintech Companies: Prioritise investment in server capacity and network infrastructure to reduce transaction failure rates and processing delays, particularly during high-volume periods. Proactive real-time transaction monitoring and instant failure notifications can significantly improve user experience [12].

For Banks and NPCI: Implement a streamlined, automated refund processing system to address the commonly reported issue of delayed refunds (10%). Establishing a guaranteed refund timeline and transparent communication mechanism would enhance consumer trust [14].

For Cybersecurity Teams: Strengthen fraud detection algorithms and invest in user-facing security education campaigns. Regular awareness communications regarding phishing, SIM swap fraud, and QR code scams would build digital confidence, addressing the 8% who reported security concerns [13].

For Policymakers and Regulators: Extend UPI infrastructure to rural and semi-urban areas by incentivising merchant onboarding and investing in last-mile digital connectivity [19]. Programmes targeting digital and financial literacy in underserved communities would expand the user base and reduce perception barriers [15].

For Future Researchers: Longitudinal and cross-regional studies with larger, more diverse samples would provide richer insight into how customer perception evolves over time with cumulative UPI usage and technological upgrades.

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