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A Comparative Analysis of UPI Adoption in India: Evaluating Trust, Preference, and Usage Patterns in Rural versus Urban Demographics

Patil Hemant[1], S. V. Tatake[2], N. V. Thakare[3], S. U. Ketkar[4]

[1,2,3,4]Department of MBA, MES' IMCC, Pune

[1]*hbp.imcc@mespune.in,* [2]*siddhitatake12@gmail.com,* [3]*nikitathakare294@gmail.com,* [4]*ketsanika87@gmail.com*

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Abstract

The research analyzes user trust and the preference of users toward Unified Payments Interface (UPI) applications in India, which have transformed the digital payments ecosystem by enabling quick, convenient, and secure financial transactions. Various government-driven initiatives such as Digital India promoting a cashless economy, applications like Google Pay, PhonePe, and Paytm have achieved extensive adoption among a wide range of users.

This study focuses on evaluating the impact of major determinants such as security, convenience, ease of operation, reliability, and user awareness on customer trust and application preference. Primary data is collected using a structured questionnaire which was distributed among respondents from diverse demographic and occupational groups. Statistical techniques, including percentage analysis and the Chi-square test, were employed to examine the association between variables such as frequency of usage and preferred UPI platforms.

The results reveal that users generally consider UPI applications to be secure, dependable, and efficient for everyday transactions. Although it was found that certain issues like transaction failures and concerns regarding data privacy still exist, overall confidence in these platforms remains high. The study concludes that trust plays a vital role in influencing user preference and continued usage, providing valuable insights for policymakers and service providers to strengthen digital payment systems and encourage broader adoption.

Keywords: UPI; Digital Payments; User Preference; Transaction Security.

How to Cite This Article

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Introduction

Unified Payments Interface (UPI) is a real-time digital payment system introduced by the National Payments Corporation of India (NPCI) and regulated by the Reserve Bank of India. Developed on the Immediate Payment Service (IMPS) infrastructure, it facilitates instant transfer of funds between bank accounts through mobile-based platforms. By offering a fast, secure, and user-friendly transaction mechanism, UPI has simplified financial activities and supported India's shift toward a digital and less-cash economy.

One of the distinguishing features of UPI is its round-the-clock accessibility, along with the ability to link multiple bank accounts within a single application. UPI ensures secure transactions through two-factor authentication and maintains user privacy via virtual payment addresses. Additionally, functionalities such as QR code-based payments, seamless merchant integration, and in-app transactions have significantly enhanced convenience for both consumers and businesses.

Over time, India's digital payment system has progressed from traditional methods like RTGS and NEFT to mobile wallets, eventually leading to the widespread adoption of UPI. Its growth accelerated after the demonetization initiative in 2016 and further expanded during the COVID-19 pandemic. Currently, UPI has become the dominant mode of digital transactions and is gradually being adopted internationally in countries such as Singapore, the UAE, and France.

UPI has also contributed to financial inclusion by enabling affordable and accessible digital transactions across both urban and rural regions. Despite its advantages, challenges such as cybersecurity risks, occasional technical issues, and regulatory interventions including restrictions on Paytm Payments Bank highlight the need to strengthen user trust and system reliability.

This study aims to analyze customer trust and preference toward major UPI applications such as Google Pay, PhonePe, Paytm, and BHIM. It evaluates how factors like security, usability, transaction speed, and awareness influence user behavior across different demographic groups, providing insights to enhance digital payment adoption and user confidence.

Review of Literature

The digital payment landscape in India has undergone a seismic shift, accelerated by regulatory changes and the COVID-19 pandemic. Badak et al. (2024) describe this as a "Revolution," noting that the surge in UPI transactions is not merely a technological trend but a fundamental shift in the Indian economy. This is supported by Walasange and Trimukhe (2023), who document the exponential growth in transaction volumes, suggesting that the infrastructure of the Unified Payments Interface (UPI) has become the backbone of India's "cash-lite" ambition. Tyagi et al. (2022) further emphasize that the accessibility of UPI apps has made them the preferred choice for real-time transactions compared to traditional banking methods.

Trust remains the most critical determinant of adoption, particularly when bridging the gap between urban and rural users. Bal and Yadav (2020) argue that while popularity is growing, perceived risk and security concerns still linger. This sentiment is echoed by Makwana et al. (2023), whose study on consumer satisfaction reveals that while users appreciate the speed of UPI, their long-term trust is tied to the reliability of grievance redressal and transaction success rates. Zehra et al. (2024) highlight that consumer behavior toward digital gateways is heavily influenced by the "security-convenience trade-off," where users are willing to adopt UPI for small amounts but may hesitate for larger, high-stakes transfers.

The literature indicates distinct usage patterns based on age and geography. Deshpande and Dhoka (2025) focus on students, identifying them as "heavy users" who utilize UPI for nearly all daily micro-transactions, often citing peer influence and "lifestyle integration" as drivers. Conversely, Veeraraghavan et al. (2021) note that while urban demographics show high literacy and frequency of use, rural adoption is often hampered by digital literacy gaps and a lingering preference for physical cash for "perceived tangible security."

Preference for specific UPI applications often depends on the user interface and value-added services. Chanda and Deb (2023) find that consumers prioritize "app ecosystem" benefits such as rewards and integration with other services—when choosing a provider. Bhuva (2023) provides a comparative analysis between mobile banking and

standalone UPI apps, concluding that the latter are preferred by younger, urban demographics for their "frictionless" experience, whereas older users may still lean toward traditional mobile banking apps due to established institutional trust.

The adoption of digital payment systems like UPI is fundamentally explained through established behavioral models. Most existing research on Indian digital payments utilizes the

Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT).

- Technology Acceptance Model (TAM): This framework suggests that Perceived Usefulness and Perceived Ease of Use" are the primary drivers for a user to adopt a digital payment gateway. In the context of UPI, its "fastest payment gateway" status and "single window" mobile system serve as these primary drivers.

- Innovation Resistance Theory (IRT): This theory is critical for your rural-urban comparison. It explains why certain demographics resist new technology due to "usage barriers" (habitual use of cash) or "psychological barriers" (lack of trust or security concerns).
- Trust and Risk Framework: Digital adoption in India is heavily mediated by "Confidence"—one of the RBI's 4Cs (Competition, Cost-Effectiveness, Convenience, and Confidence). Trust is often hindered by "security problems" and "lack of technological knowledge," particularly in segments with lower digital literacy.

Problem Statement

Despite the widespread adoption of UPI across India, variations exist in customer trust and application preferences among different user groups, particularly between urban and rural populations. Key factors such as security, reliability, transaction speed, user-friendliness, and brand image play an important role in influencing app selection; however, their impact varies across different demographic segments.

Research Gaps

The examination of existing studies conducted between 2020 and 2025 reveals that the majority of researches have primarily concentrated on usage behavior, user satisfaction, and convenience aspects of UPI and digital payment platforms. Although these studies highlight the growing popularity of UPI applications, several critical gaps remain unaddressed:

- Limited emphasis on customer trust: Prior researches have explored factors such as security and convenience and it is found that there are insufficient studies on understanding how trust directly influences user preference and continued adoption of UPI applications.

- Lack of urban–rural comparative analysis: Most studies are centered on urban populations, particularly students and salaried individuals, with minimal attention given to rural users and their trust levels or adoption patterns.

- Insufficient analysis of post-regulatory behavior: There is a lack of research examining how recent regulatory actions by the Reserve Bank of India such as restrictions, temporary bans, or fraud control measures have impacted user trust and preferences regarding UPI platforms.

Scope of the Study

This research aims to examine customer trust and preference regarding UPI applications in India, including platforms such as Google Pay, PhonePe, Paytm, and BHIM. It evaluates how various factors such as security, privacy, user-friendliness, incentives, reliability, and transaction speed affect user choices and decision-making.

The study involves participants from both urban and rural regions to compare differences in awareness, accessibility, and usage behavior. Thus it includes a diverse group of users, including students, salaried professionals, government employees, entrepreneurs, homemakers, and farmers who frequently engage in UPI-based transactions.

The primary emphasis is on analyzing user perceptions, satisfaction levels, and challenges encountered during digital payments rather than technical or system-level aspects. The insights derived from this study are intended to promote the development of a more inclusive and digitally driven economy in India.

Hypothesis

H_0: There is no statistically significant difference in the usage patterns of UPI applications between urban and rural users.
H_1: There is a statistically significant difference in the usage patterns of UPI applications between urban and rural users.
H_0: There is no statistically significant difference in the preference for UPI applications between urban and rural users.
H_1: There is a statistically significant difference in the preference for UPI applications between urban and rural users.

Research Design

The present study employs a descriptive research design to analyze and compare customer trust and preferences toward UPI applications across urban and rural populations. It includes a diverse set of respondents, such as students, salaried individuals, business owners, homemakers, and users from rural areas.

A descriptive approach is appropriate for gathering systematic information related to user behavior, perceptions, and satisfaction levels. It facilitates an in-depth understanding of how customers evaluate UPI applications and the factors that influence their trust and usage patterns. The collected data was processed using percentage analysis and the Chi-square test with the support of Microsoft Excel.

This research design is suitable as the study aims to observe and interpret user attitudes without altering variables or establishing causal relationships. Given that UPI is already a widely adopted system, a descriptive methodology is more effective than an exploratory approach in fulfilling the objectives of the study.

Data Collection Methods

This research is based on the use of both primary and secondary data to analyze customer trust and preference toward UPI applications.

Primary Data

The primary data was collected through a structured questionnaire administered to 150 respondents. The survey consisted of multiple-choice and Likert-scale questions designed to assess user trust, preferences for UPI applications (including Google Pay, PhonePe, and Paytm), challenges experienced during transactions, and factors influencing satisfaction and continued usage. The respondents were selected from diverse backgrounds such as students, salaried individuals, business owners, homemakers, government employees, and farmers, representing both urban and rural areas.

Secondary Data

Secondary data was obtained from published research papers, academic journals, articles, and credible online sources. This information was utilized to understand trends in UPI adoption, compare findings from previous studies, identify existing research gaps, and analyze the impact of regulatory developments on user trust.

The combination of primary and secondary data enhances the depth and reliability of the analysis, providing a more comprehensive understanding of the research problem.

Data Collection & Analysis

UPI App Usage

The data examines user preferences for commonly used UPI (Unified Payments Interface) applications, with a comparative perspective between urban and rural respondents. The primary objective of this analysis is to determine whether geographical location influences the selection of digital payment platforms, particularly in the context of expanding financial inclusion in India. The data collected shows the distribution of respondents based on location type. Out of the total 150 respondents surveyed, 84 belong to urban areas (cities), while a slightly higher number, 66 respondents, are from rural or village areas. This data indicates a balanced representation of both urban and rural populations in the study which allows a comparison of UPI app usage patterns across different geographical locations. The inclusion of a larger rural sample also highlights the growing penetration and relevance of digital payment systems like UPI beyond urban centres, supporting the objective of analyzing location-based differences in usage and preferences.

Table 1. Preferred UPI Applications Among Rural and Urban Respondents

UPI Apps	Rural	Urban	Total
Google Pay	48	58	106
Phone Pe	12	16	28
BHIM	2	4	6
Amazon Pay	0	2	2
Super Money	2	2	4
Navi	2	2	4
TOTAL	66	84	150

Respondents were categorized based on their area of residence (urban or rural), and their most frequently used UPI applications such as Google Pay, PhonePe, BHIM, Amazon Pay, and others were identified. This classification enabled a comparative assessment of usage trends across different regions.

H_0: There is no significant difference between urban and rural users in their preference for the UPI app they use most frequently.

H_1: There is a significant difference between urban and rural users in their preference for the UPI app they use most frequently.

To evaluate the relationship between location and application preference, a Chi-square test was conducted. The obtained p-value (0.960482) exceeds the standard significance level of 0.05. Hence, the null hypothesis was accepted, indicating that there is no statistically significant difference between urban and rural users in terms of their preferred UPI applications. This finding suggests that UPI adoption and platform preference remain largely consistent across geographical regions, reflecting the widespread acceptance of digital payment systems.

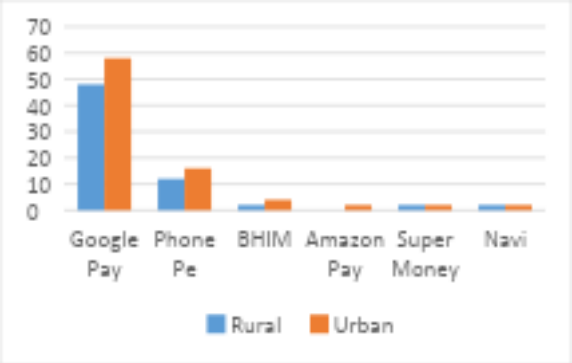

Fig. 1. *Comparison of Preferred UPI Applications Among Rural and Urban Respondents*

UPI Usage Patterns

The study also investigates how frequently users engage with UPI applications across urban and rural areas. The purpose of this analysis is to identify differences in usage behavior and transaction frequency between these groups. The usage of UPI has been increasing on rapid basis. This study tries to find out the frequency of UPI usage. With growing modernization it is observed that UPI usage has been an important part of daily transactions. Through this study it can been seen that the frequency of UPI application usage is very high irrespective of the location. This is an indication that there is a rise in the trust and reliability on the UPI applications which can be considered as an indication of a steady economic and technological transformation.

To collect this data, respondents were grouped according to their location and categorized based on usage frequency (daily, weekly, occasional, or rare usage). This classification provided insights into variations in transaction habits across regions.

Hypothesis

H_0: There is no significant difference between urban and rural users in the frequency of using UPI apps for transactions.

H_1: There is a significant difference between urban and rural users in the frequency of using UPI apps for transactions.

Table 2. Frequency of UPI Application Usage Among Rural and Urban Respondents

Use of UPI Apps	Rural	Urban	Total
Daily	40	60	100
2–3 times a week	24	10	34
Once a week	8	0	8
Rarely	8	0	8
TOTAL	80	70	150

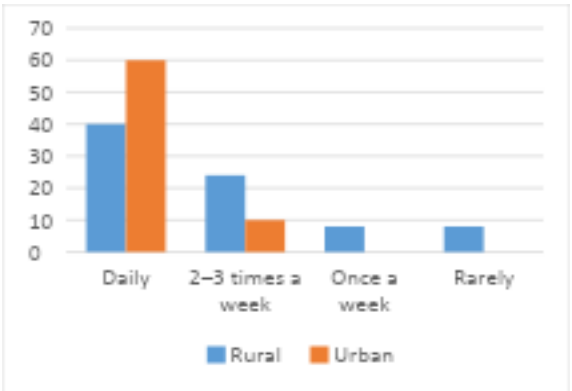

Fig. 2. *Frequency of UPI Application Usage Among Rural and Urban Respondents*

UPI Usage Frequency

A Chi-square test was applied to examine the association between location and usage frequency. The resulting p-value (0.00557345) is lower than the significance level of 0.05. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This indicates a statistically significant difference between urban and rural users in terms of how frequently they use UPI applications.

The results suggest that urban users tend to use UPI services more frequently often on a daily or weekly basis while rural users may use them less regularly or primarily for specific transactions. The variation which is seen may be attributed to factors such as differences in internet accessibility, levels of digital literacy, and spending patterns.

Key Factors Influencing UPI App Selection

The analysis further identifies important factors affecting customer choice of UPI applications. These factors are evaluated using mean scores and standard deviation to measure user perception and response consistency. The findings indicate that convenience, trust, and ease of use are the most influential determinants of user preference.

Table 3. Descriptive Statistics of Factors Influencing UPI Adoption and User Preference

Sr. No.	Factor	Mean	SD
1	Application Security	3.48	0.90
2	Reliability	3.52	0.90
3	Transaction Speed	3.30	1.02
4	Ease of Use	3.86	0.84
5	Cashback & Rewards	3.24	1.01
6	Wide Acceptance	3.97	0.87
7	Brand Reputation	3.86	0.72
8	Low/No Transaction Charges	3.68	0.84

1. Application Security (Mean: 3.48, SD: 0.90)

Respondents generally perceive UPI applications as secure platforms capable of safeguarding their financial and personal information. Security emerges as a key element in building user trust.

2. Reliability (Mean: 3.52, SD: 0.90)

Most users consider UPI applications to be dependable, with transactions typically completed successfully and minimal instances of failure. This makes reliability an essential factor in user preference.

3. Transaction Speed (Mean: 3.30, SD: 1.02)

Users exhibit moderate satisfaction with transaction speed. Although transactions are often processed quickly, occasional delays can negatively affect the overall user experience.

4. Ease of Use (Mean: 3.86, SD: 0.84)

A significant proportion of respondents find UPI applications simple to operate and user-friendly. An intuitive interface and smooth navigation strongly contribute to higher adoption levels.

5. Cashback and Rewards (Mean: 3.24, SD: 1.01)

Users display a neutral attitude toward cashback and reward schemes, indicating that such incentives are not a primary factor influencing app selection.

6. Wide Acceptance (Mean: 3.97, SD: 0.87)

This factor received one of the highest ratings, highlighting that users prefer applications that are widely accepted across merchants, thereby enhancing everyday convenience.

7. Brand Reputation (Mean: 3.86, SD: 0.72)

The reputation of established brands, such as Google Pay and PhonePe, plays a significant role in shaping user preference, as well-known platforms are often associated with greater safety and reliability.

8. Low or No Transaction Charges (Mean: 3.68, SD: 0.84)
Cost considerations are important to users, with a preference for applications that offer minimal or zero transaction fees, making affordability a key determinant.

Table 4. Interpretation of Descriptive Statistics for Factors Influencing UPI Adoption

Aspect	**Insight**
Mean Range	3.24 to 3.97, indicating an overall positive perception and agreement among respondents regarding the factors influencing UPI adoption.
Highest Mean	Wide Acceptance (3.97), identified as the most important factor influencing user preference and adoption of UPI services.
Lowest Mean	Cashback & Rewards (3.24), indicating that promotional incentives are comparatively less influential in driving UPI usage.
Standard Deviation	0.72 to 1.02, reflecting low variation and a high degree of consistency in respondents' opinions.

The mean values range from 3.24 to 3.97, indicating that most respondents agree or strongly agree with positive statements about UPI apps.

The highest mean (3.97) for wide acceptance suggests that convenience and accessibility are the most appreciated features among users.

The lowest mean (3.24) for cashback and rewards shows that monetary benefits are less important compared to usability and reliability.

The standard deviation values (0.72 to 1.02) are relatively low, showing that respondents' opinions are consistent and not widely scattered.

Overall Interpretation

The analysis indicates that factors such as ease of use, widespread acceptance, and brand credibility have the strongest influence on user preference. In contrast, cashback and promotional offers have relatively less impact. This suggests that users prioritize functionality, convenience, and trust over short-term incentives when selecting a UPI application.

Findings

- From Figure no.2, It is found that Google Pay and PhonePe are the most frequently used and preferred UPI applications by both urban and rural users.
- From the above analysis, it is found that the Chi-square test results show no significant difference between urban and rural respondents in terms of preferred UPI app, transaction type, or usage frequency.

Suggestions

- Enhance Transaction Speed and Reliability- UPI service providers should focus on reducing transaction failures and pending issues to improve user confidence.
- Strengthen Security and Fraud Detection- Implement stronger verification systems, OTP alerts, and AI-based fraud detection to ensure data and money safety.
- Focus on Brand Credibility- Apps should communicate compliance with RBI norms and highlight their data safety measures to strengthen brand trust.
- Encourage Secure Cashbacks or Loyalty Programs- Introduce loyalty-based incentives that are transparent and trustworthy rather than short-term cashback schemes.
- Technical Up-gradation and Server Stability- Regular updates and server improvements will help prevent delays and enhance the speed of digital payments.
- Promote Interoperability and Merchant Adoption- Encourage more small businesses and vendors to accept UPI payments to ensure wide acceptance and convenience for users.

Conclusion

The findings of this study indicate that UPI applications have become an essential component of everyday financial transactions for users across both urban and rural regions in India. The analysis shows that there is no statistically significant difference between these groups in terms of application preference, type of transactions, or overall usage patterns, reflecting the widespread adoption of digital payment systems nationwide. Among the available platforms, Google Pay and PhonePe are identified as the most preferred and trusted applications, primarily

due to their user-friendly interfaces, reliability, and attractive incentive features. Key determinants influencing user choice include security, transaction speed, and convenience. Despite the overall positive perception, certain challenges such as occasional technical issues, transaction failures, and concerns related to data privacy continue to slightly impact user confidence. The study also highlights that younger and more educated individuals are more inclined toward digital payment methods compared to older users.

Furthermore, recent regulatory actions, including those taken by the Reserve Bank of India against Paytm Payments Bank, emphasize the importance of regulatory compliance and transparency in sustaining user trust. Overall, the study demonstrates that UPI has significantly transformed consumer payment behavior in India by fostering a more efficient, transparent, and cashless financial ecosystem.

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