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DIGITAL PAYMENT TRANSFORMATION IN INDIA: A COMPARATIVE ANALYSIS OF BANK-BASED AND THIRD-PARTY APPLICATIONS

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ABSTRACT

The rapid expansion of digital payments has transformed India's financial services ecosystem, with the Unified Payments Interface (UPI) emerging as a major component of retail digital payments. The UPI ecosystem comprises both bank-based applications and third-party application providers (TPAPs), creating a distinctive competitive environment in the digital payment landscape.

This study aims to comparatively examine the performance of selected bank-based and third-party digital payment applications in India and assess their relative position within the UPI ecosystem.

The study adopts a descriptive and comparative research design based exclusively on secondary data. Data were obtained from the National Payments Corporation of India (NPCI), Reserve Bank of India (RBI), annual reports, regulatory publications and relevant scholarly literature. The analysis considers transaction volume, transaction value, growth trends and application-level market concentration among selected bank-based applications and leading TPAPs.

The analysis indicates a substantial difference in transaction activity between the selected categories. In August 2025, PhonePe, Google Pay and Paytm together recorded 17,623.53 million UPI transactions, whereas the six selected bank-based applications recorded 422.99 million transactions. The findings indicate that leading TPAPs have established a considerably stronger position at the customer-facing application layer of the UPI ecosystem. However, bank-based applications retain strategic advantages arising from direct customer relationships, established financial infrastructure and integration with broader banking services.

India's digital payment transformation has shifted competitive advantage beyond traditional banking infrastructure towards application usability, scale, interoperability, technological innovation and digital ecosystems. Banks need to strengthen their digital platforms through improved user experience, artificial intelligence, cybersecurity, merchant integration and personalised financial services. The study highlights the implications of this transformation for financial inclusion, FinTech innovation and competition in India's digital financial ecosystem.

KEYWORDS: *Digital Payments; UPI; Bank-Based Applications; Third-Party Applications; FinTech*

1. INTRODUCTION

Digital technology has fundamentally transformed the delivery and consumption of financial services. The increasing availability of smartphones, affordable internet connectivity, mobile banking and real-time payment infrastructure has accelerated the transition from traditional cash-based payments towards digital transactions. In India, this transformation has been particularly significant following the emergence and rapid expansion of the Unified Payments Interface (UPI).

UPI, developed by the National Payments Corporation of India (NPCI), provides an interoperable platform that enables customers to initiate instant bank-account-based transactions through participating applications. Customers can access UPI through bank-operated applications as well as third-party application providers (TPAPs). This architecture has created a distinctive digital payment ecosystem in which banks continue to control the underlying accounts and financial infrastructure, while third-party platforms increasingly compete for the customer-facing payment experience. [1]

The scale of India's digital payment transformation is substantial. NPCI's UPI statistics demonstrate continuous expansion in both transaction volume and value, highlighting the increasing importance of UPI within India's retail payment infrastructure. [2]

The competitive structure of the UPI application ecosystem is particularly noteworthy. Leading third-party applications such as PhonePe, Google Pay and Paytm have achieved transaction volumes substantially higher than those of individual bank-based applications. NPCI's application-level statistics provide an important empirical basis for examining this difference. [1]

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This development raises an important research issue. Banks traditionally maintain direct relationships with customers and possess extensive financial infrastructure. However, third-party applications have established significant positions in the customer-facing digital payment environment through interoperability, convenience, merchant acceptance, technological innovation and application-centric ecosystems.

Consequently, digital payment transformation is no longer simply a movement from physical to electronic payments. It also represents a transformation in where competitive advantage is created within the financial services value chain.
The present study therefore compares selected bank-based and third-party digital payment applications in India using secondary data and examines the implications of their relative performance for digital transformation, FinTech innovation and financial inclusion.

2. BACKGROUND OF DIGITAL PAYMENTS IN INDIA

India's digital payment ecosystem has developed through several technological and institutional innovations, including electronic fund transfers, mobile banking, Immediate Payment Service (IMPS), Bharat Interface for Money (BHIM) and subsequently UPI.
UPI introduced interoperability across banks and payment applications and significantly reduced the friction associated with account-to-account digital payments. Its open and interoperable architecture enabled multiple applications to participate in the payment ecosystem.

The RBI Digital Payments Index provides evidence of India's rapid digital transformation. The index increased from 100 in March 2018 to 445.50 in March 2024, indicating significant expansion in digital payment infrastructure and adoption. [3]

Table 1. RBI Digital Payments Index

Period	RBI Digital Payments Index
March 2018	100.00
March 2019	153.47
March 2020	207.84
March 2021	270.59
March 2022	349.30
March 2023	395.57
March 2024	445.50
September 2024	465.33

Source: Reserve Bank of India. [3,4]
As shown in **Table 1**, India's digital payment ecosystem has experienced sustained growth. The increase in the Digital Payments Index reflects improvements in payment infrastructure, payment performance and digital payment usage. [3,4]

3. REVIEW OF LITERATURE

Research on digital payments in India has expanded considerably with the growth of UPI and FinTech.
Pahari et al. examined user intentions and perceptions regarding third-party and banking payment applications and highlighted the importance of understanding the factors influencing users' interaction with digital payment platforms. [5]

Dam and George investigated customer perceptions of UPI-based mobile payment applications and examined factors associated with the use and perception of major payment applications. [6]

Jacob et al. examined UPI adoption among low-income consumers in India and highlighted the relevance of perceived risk and facilitating conditions in digital payment adoption. [7]

Motheram and Buteau examined supply-side drivers of digital payment adoption across Indian districts and demonstrated the importance of digital infrastructure and merchant-network development in expanding digital payment adoption. [8]

Recent research on bank-owned UPI applications has also identified usability, customer service, awareness, perceived value and promotional strategies as relevant competitive issues for bank-operated payment applications. [9]

The existing literature has predominantly focused on consumer adoption, perceptions, trust, behavioural intentions and usage factors. Comparatively less attention has been given to the secondary-data-based comparative performance of bank-based applications and TPAPs using transaction volume, transaction value and application-level market concentration.

This study addresses this gap by examining the competitive structure of the UPI application ecosystem from a platform-performance perspective.

4. RESEARCH GAP

The existing literature provides substantial insights into digital payment adoption and consumer behaviour. However, three gaps can be identified.

First, much of the existing research examines digital payment adoption through primary surveys rather than application-level transaction data.

Second, limited research comparatively examines bank-based applications and third-party applications as competing components of the UPI ecosystem.

Third, the rapid evolution of UPI requires updated analysis of application-level transaction performance and market concentration. The present study addresses these gaps through a secondary-data-based comparative analysis of selected applications.

5. OBJECTIVES OF THE STUDY

1. To examine the growth of digital payments and UPI transactions in India.
2. To compare the transaction volume and transaction value of selected bank-based and third-party digital payment applications.
3. To analyse the relative market position of selected bank-based applications and third-party application providers.
4. To examine the concentration of transaction activity among leading UPI applications.
5. To identify the major challenges and opportunities faced by bank-based applications in the evolving digital payment ecosystem.
6. To suggest strategies for strengthening bank-based digital payment applications in India.

6. RESEARCH METHODOLOGY

6.1 Research Design

The study adopts a descriptive and comparative research design based entirely on secondary data.
The comparative approach is used to evaluate differences between selected bank-based and third-party applications with respect to transaction volume, transaction value and relative market position.

6.2 Sources of Data

Secondary data were collected from:

- National Payments Corporation of India (NPCI)
- Reserve Bank of India (RBI)
- RBI Annual Reports
- RBI Digital Payments Index
- Bank annual reports
- Regulatory publications
- Peer-reviewed research articles
- Industry reports

NPCI's UPI ecosystem statistics provide application-level transaction information and identify TPAP applications separately. [1]

6.3 Selection of Applications

The study considers the following selected applications.

Bank-Based Applications:

- State Bank of India Apps
- HDFC Bank Apps
- ICICI Bank Apps
- Axis Bank Apps
- Kotak Mahindra Bank Apps
- Yes Bank Apps

Third-Party Applications:

- PhonePe
- Google Pay
- Paytm

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6.4 Variables
The major variables considered are:
- Transaction volume
- Transaction value
- Market share
- Growth
- Relative application performance
- Market concentration

6.5 Analytical Techniques
The study employs:
- Percentage analysis
- Comparative analysis
- Growth analysis
- Market-share analysis
- Ratio analysis

7. RESULTS AND ANALYSIS
7.1 Selected UPI Application Performance
NPCI's August 2025 application-level statistics provide a useful basis for comparing selected bank-based and third-party applications. [1]

Table 2. Transaction Performance of Selected UPI Applications – August 2025

Category	Application	Transactions (Million)	Transaction Value (₹ Crore)
Third Party	PhonePe	9,152.54	11,99,457.73
Third Party	Google Pay	7,063.76	8,83,682.27
Third Party	Paytm	1,407.23	1,43,484.97
Bank-Based	Axis Bank Apps	135.14	9,812.52
Bank-Based	ICICI Bank Apps	75.80	16,589.76
Bank-Based	HDFC Bank Apps	72.86	16,120.19
Bank-Based	Kotak Mahindra Bank Apps	71.87	8,662.31
Bank-Based	Yes Bank Apps	54.33	9,428.15
Bank-Based	State Bank of India Apps	12.99	3,668.47

Source: Compiled from NPCI UPI Ecosystem Statistics, August 2025. [1]
As presented in **Table 2**, the leading third-party applications recorded considerably higher transaction volumes than the selected bank-based applications.

7.2 Comparative Transaction Volume
The six selected bank-based applications collectively recorded:
422.99 million transactions in August 2025.
In comparison, PhonePe, Google Pay and Paytm collectively recorded: **17,623.53 million transactions.**
Therefore, the selected third-party applications recorded approximately **41.7 times** the transaction volume of the six selected bank-based applications.

This finding indicates the substantial scale achieved by leading TPAPs in the customer-facing UPI application layer.
However, the comparison should not be interpreted as representing the entire banking sector versus the entire TPAP sector because only selected applications are included.

7.3 Comparative Transaction Value
The six selected bank-based applications recorded a combined transaction value of approximately: **₹64,281.40 crore** during August 2025.

The three selected TPAPs recorded approximately: **₹22,26,624.97 crore.**
The data indicate that leading TPAPs dominate both transaction volume and transaction value among the selected applications.
However, **Table 2** also demonstrates that higher transaction volume does not necessarily imply higher transaction value per transaction.

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For example, ICICI Bank Apps recorded 75.80 million transactions with a transaction value of ₹16,589.76 crore, whereas Axis Bank Apps recorded 135.14 million transactions with a lower total value of ₹9,812.52 crore. [1]

8. MARKET CONCENTRATION

The three selected TPAPs accounted for approximately **88.08% of total UPI transaction volume** in August 2025 when compared with the total UPI transaction volume reported by NPCI.

The six selected bank-based applications together represented approximately **2.11%** of total UPI transaction volume.

Table 3. Comparative Position of Selected Application Categories

Measure	Selected TPAPs	Selected Bank Applications
Number of applications	3	6
Total transactions (million)	17,623.53	422.99
Total transaction value (₹ crore)	22,26,624.97	64,281.40
Approximate share of total UPI volume	88.08%	2.11%
TPAP-to-bank transaction-volume ratio	41.7:1	—

Source: Author's calculation based on NPCI UPI Ecosystem Statistics. [1]

As indicated in **Table 3**, the selected TPAPs have a considerably stronger position in terms of application-level transaction activity. The concentration also highlights an important strategic issue for banks: **the institution controlling the customer's bank account is not necessarily the institution controlling the customer's digital payment interface.**

9. BANK-BASED APPLICATIONS VERSUS THIRD-PARTY APPLICATIONS

Table 4. Comparative Characteristics of Bank-Based and Third-Party Applications

Dimension	Bank-Based Applications	Third-Party Applications
Customer relationship	Direct banking relationship	Primarily platform relationship
Banking integration	Strong	Through partner banks
UPI interoperability	Available	Strong
Transaction scale	Relatively lower among selected apps	Very high among leading TPAPs
Merchant ecosystem	Developing	Extensive
Application orientation	Banking + payments	Payments + digital ecosystem
Innovation	Increasing	High
Financial-service integration	Strong	Increasing
Major advantage	Trust and banking relationship	Scale, convenience and ecosystem

Source: Compiled by the author based on the literature and UPI ecosystem structure. [1,5,9]

As shown in **Table 4**, the two categories possess different competitive strengths. Bank-based applications have advantages arising from direct banking relationships and integrated financial services, whereas TPAPs have established significant competitive advantages through application experience, scale and ecosystem development.

10. DIGITAL TRANSFORMATION AND FINTECH INNOVATION

UPI demonstrates that digital transformation in financial services extends beyond the conversion of traditional services into digital formats.

The current ecosystem increasingly incorporates:

- QR-based payments
- UPI Lite
- UPI AutoPay
- Credit-linked UPI
- Conversational payments
- Cross-border payments
- Artificial intelligence
- Fraud detection
- Personalised financial services

These developments demonstrate the convergence of banking and FinTech.

For banks, the challenge is therefore not merely to provide UPI functionality but to create **competitive digital financial ecosystems**.

11. FINANCIAL INCLUSION IMPLICATIONS

Digital payments can contribute to financial inclusion by reducing transaction barriers and increasing access to formal financial services.

The RBI Financial Inclusion Index increased from 43.4 in March 2017 to 64.2 in March 2024, indicating progress in financial inclusion across access, usage and quality dimensions. [10]

UPI's interoperable structure enables customers to transact across participating banks and applications, thereby reducing dependence on a particular bank or payment platform.

However, high concentration among leading applications also creates a need to ensure competition, resilience, cybersecurity and consumer choice.

Thus, digital transformation should be evaluated not only in terms of transaction growth but also in terms of **accessibility, affordability, security and inclusiveness**.

12. CHALLENGES FACED BY BANK-BASED APPLICATIONS

The major challenges include:

12.1 User Experience

Third-party applications have established simple and payment-focused interfaces. Banks need to reduce complexity within their applications.

12.2 Technological Innovation

Banks may face challenges associated with legacy technology and integration requirements.

12.3 Merchant Ecosystem

Building extensive merchant acceptance networks remains important for strengthening application usage.

12.4 Customer Engagement

Banks need stronger digital engagement strategies to compete with platform-oriented applications.

12.5 Cybersecurity

Increasing digital transactions require continuous investment in fraud detection, authentication and cybersecurity.

13. OPPORTUNITIES FOR BANK-BASED APPLICATIONS

13.1 AI-Based Personalisation

Artificial intelligence can help banks provide personalised financial recommendations and intelligent customer support.

13.2 Integrated Financial Services

Banks can combine:

- Payments
- Savings
- Deposits
- Loans
- Insurance
- Investments
- Credit cards
- Wealth management

within a single digital ecosystem.

13.3 Rural Digital Finance

Banks can leverage their established physical networks to promote digital financial inclusion in rural and semi-urban markets.

13.4 Data-Driven Financial Services

Responsible use of transaction data can help banks develop personalised financial products while maintaining privacy and regulatory compliance.

13.5 Digital Ecosystem Development

Banks can shift from viewing mobile applications as transaction tools towards developing comprehensive digital financial platforms.

14. DISCUSSION

The findings reveal a significant structural difference between selected bank-based and third-party UPI applications.

The high transaction volume of leading TPAPs indicates that competitive advantage in digital payments increasingly depends on the **customer-facing platform** rather than solely on ownership of the underlying bank account.

This finding complements earlier research that identifies usability, convenience, trust, perceived value and application characteristics as important elements of digital payment adoption. [5-7]

At the same time, banks retain structural advantages because they control core banking relationships and can integrate payments with deposits, credit, investment and insurance services.

Therefore, the competition should not be viewed as a simple replacement of banks by FinTech companies. Rather, India's UPI ecosystem represents **a hybrid financial architecture in which banks and FinTech platforms occupy different but interconnected positions.**

15. RECOMMENDATIONS

Based on the findings, the following recommendations are proposed:

1. Banks should simplify their digital payment interfaces.
2. Banks should increase investment in AI-enabled digital services.
3. Application reliability and transaction-success rates should be continuously improved.
4. Banks should strengthen merchant acceptance networks.
5. Payment services should be integrated with broader financial services.
6. Banks should develop personalised digital financial-management services.
7. Cybersecurity and fraud-detection capabilities should be strengthened.
8. Digital financial literacy should be promoted, particularly among underserved populations.
9. Regulators should continue monitoring application-level concentration.
10. Banks and FinTech companies should pursue responsible innovation while maintaining interoperability.

16. LIMITATIONS OF THE STUDY

The study has several limitations.
First, it relies exclusively on secondary data and therefore does not measure consumer perceptions or satisfaction.
Second, only selected bank-based and third-party applications are included.
Third, NPCI application statistics represent application-level transaction attribution and should not be interpreted as direct measures of the total customer base of an application.
Fourth, transaction volume and transaction value do not independently measure application quality, customer loyalty or user satisfaction.
Finally, the rapidly changing nature of the digital payment ecosystem means that application rankings and competitive positions may change over time.

17. FUTURE RESEARCH DIRECTIONS

Future research may:

- Conduct longitudinal analysis of UPI application performance.
- Compare a larger number of bank-based applications and TPAPs.
- Examine the impact of AI on digital payment applications.
- Study rural and urban differences in digital payment adoption.
- Analyse cybersecurity and digital-payment fraud.
- Examine customer switching between bank-based and third-party applications.
- Conduct primary surveys on consumer application preferences.
- Examine the relationship between promotional strategies and application usage.
- Compare India's UPI ecosystem with international real-time payment systems.
- Study the long-term impact of market concentration on competition.

18. CONCLUSION

India's digital payment ecosystem has undergone a significant transformation, with UPI becoming one of the country's most important retail payment infrastructures. The emergence of bank-based applications and third-party application providers has created a competitive digital environment in which the customer-facing payment platform has become an important source of competitive advantage.
The comparative analysis indicates that selected leading TPAPs have achieved substantially greater transaction activity than the selected bank-based applications. In August 2025, PhonePe, Google Pay and Paytm collectively recorded 17,623.53 million transactions compared with 422.99 million transactions recorded by the six selected bank-based applications. [1]
The findings suggest that traditional banking strengths such as customer relationships, account ownership and financial infrastructure do not automatically translate into dominance at the digital application layer.

Nevertheless, banks possess significant opportunities. Their established customer relationships and ability to integrate payments with credit, savings, investment and insurance provide advantages that can be strengthened through technological innovation.

The future of India's digital payment ecosystem is therefore likely to depend on the convergence of banking expertise, FinTech innovation, artificial intelligence, cybersecurity, interoperability and superior digital customer experience.

From a financial inclusion perspective, the continuing expansion of UPI provides opportunities to increase access to formal financial services. However, sustainable digital transformation requires an appropriate balance between innovation, competition, security, resilience and consumer protection.

The study concludes that India's digital payment transformation represents more than a shift from cash to digital transactions. It reflects a fundamental restructuring of the financial-services value chain in which technology platforms, banks and FinTech firms increasingly share the delivery of financial services.

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