

AN ANALYSIS OF UNIFIED PAYMENTS INTERFACE (UPI): PAYER AND PAYEE PSP PERFORMANCE, UPI APPS, AND P2P AND P2M TRANSACTION TRENDS IN INDIA

M. Dinesh Kumar

Department of Commerce with Computer Applications, Mannar Thirumalai Naicker College, India

Abstract

This study investigates the Unified Payments Interface (UPI) ecosystem in India from October 2022 to October 2024, focusing on UPI Payer and Payee Payment Service Provider (PSP) performance, UPI apps, and P2P (Peer-to-Peer) and P2M (Peer-to-Merchant) transactions. Using a mixed-methods approach, quantitative data from official sources like NPCI and RBI reports provides insights into transaction volumes, values, and trends across various PSPs and UPI apps. The study also explores factors influencing UPI growth, such as digital literacy and financial inclusion, using regression analysis. The research highlights the significant growth in UPI transactions, the dominance of leading apps like PhonePe and Google Pay, and the impact of UPI on digital payments for small and medium businesses. These findings aim to offer a comprehensive overview of the UPI landscape and its future potential in India's digital payment sector. The data highlights the exponential growth and evolving landscape of UPI transactions in India over the three-year period. From October 2022 to October 2024, the total transaction volume surged from 7,305.42 million to 16,584.97 million, while the transaction value escalated from ₹12,11,582.51 crores to ₹23,49,821.45 crores. This growth underscores the increasing adoption and reliance on digital payments. Leading UPI apps such as PhonePe, Google Pay, and Paytm consistently dominated the market, reflecting their strong user base and robust infrastructure. Notably, new entrants like Navi, Cred, and FamApp by Trio also made significant inroads, indicating a diversification in user preferences and app offerings. In terms of bank performance, Axis Bank, Yes Bank, and ICICI Bank emerged as key players in both Payer and Payee PSP categories, maintaining high approval rates and substantial transaction volumes. The data also shows a clear distinction between peer-to-peer (P2P) and peer-to-merchant (P2M) transactions, with P2P transactions contributing significantly to the total transaction value. Overall, the UPI ecosystem's remarkable growth, coupled with the diverse performance of various apps and banks, highlights the transformative impact of digital payments on the Indian economy. The trends reflect not only increased user confidence but also the efficiency and reliability of UPI as a preferred mode of transaction.

Keywords:

Unified Payments Interface (UPI), National Payments Corporation of India (NPCI), Peer-to-Peer (P2P) Transactions, Peer-to-Merchant (P2M) Transactions, Virtual Payment Address (VPA) and Payment Apps (PhonePe, Google Pay, Paytm)

1. INTRODUCTION

The Unified Payments Interface (UPI) is a revolutionary digital payment system introduced by the National Payments Corporation of India (NPCI) in 2016. UPI allows seamless, real-time money transfers between bank accounts using mobile devices. This instant and secure payment platform has transformed the way India conducts digital transactions, making financial services more accessible, efficient, and inclusive. UPI simplifies the payment process by allowing users to send or receive money using a Virtual Payment Address (VPA) linked to

their bank account, eliminating the need for complex bank account details. With 24/7 availability and interoperability across different banks, UPI supports both Peer-to-Peer (P2P) and Peer-to-Merchant (P2M) transactions. It has gained immense popularity due to its ease of use, low transaction costs, and robust security features, including multi-layered authentication. UPI has played a crucial role in promoting a cashless economy, fostering financial inclusion, and driving India's digital payment revolution. It has seen rapid adoption among individuals and businesses alike, with a wide range of banks and payment platforms such as PhonePe, Google Pay, Paytm, and Amazon Pay actively contributing to its success. As UPI continues to grow, it remains a key component of India's vision for a more digital and financially inclusive future.

1.1 FEATURES OF UPI IN INDIA

- **Real-Time Payments:** UPI enables real-time, peer-to-peer (P2P) and peer-to-merchant (P2M) payments, making transactions quick and efficient.
- **Interbank Transactions:** UPI is an interoperable system, meaning that it allows seamless fund transfers between different banks without needing a separate account or platform.
- **Simple User Experience:** UPI requires only a smartphone and internet connection for users to send and receive money. It uses a mobile number (linked to a bank account) and a unique identifier called a VPA (Virtual Payment Address) to initiate transactions.
- **Security Features:** UPI transactions are secured with two-factor authentication, including a PIN that the user sets up. This ensures high levels of security for both financial and personal information.
- **Wide Acceptance:** UPI has gained significant traction across India, being accepted by all major banks and numerous merchant outlets, making it a popular choice for digital payments.
- **Impact and Growth:** Since its launch, UPI has seen exponential growth in terms of both transaction volume and value. It has become the go-to payment method for daily transactions, ranging from small purchases to large-scale payments. UPI's scalability and ease of use have made it a vital tool for financial inclusion, enabling millions of previously unbanked individuals to engage in the digital economy.

Key players in the UPI ecosystem include major banks (e.g., State Bank of India, ICICI Bank, HDFC Bank, and Axis Bank) and third-party apps like Google Pay, PhonePe, Paytm, and Bhim UPI, all of which facilitate UPI transactions. These platforms contribute significantly to UPI's success by offering additional

features, such as bill payments, ticketing, and financial services integration.

1.2 BENEFITS OF UPI

- **Cost-Effective:** UPI eliminates the need for cash and traditional banking services, reducing transaction costs for individuals and businesses.
- **Inclusive Financial System:** UPI helps extend financial services to rural and underserved areas, thereby contributing to financial inclusion.
- **Promotion of Digital Economy:** UPI has significantly advanced the digital payment landscape in India, contributing to the country's broader vision of a cashless economy.

1.3 CHALLENGES AND FUTURE PROSPECTS

Despite its remarkable success, UPI faces challenges such as digital literacy, cybersecurity concerns, and the need for further infrastructure development in rural areas. However, with continued technological innovations, regulatory support, and the rise of financial awareness, UPI is expected to play a key role in India's transition to a fully digital economy.

2. REVIEW OF LITERATURE

Chatterjee, S., and Paul, J. [3] analyzes the factors influencing consumer adoption of UPI. It focuses on the role of convenience, security, and user awareness in driving UPI usage. The research identifies demographic factors such as age and education that affect adoption. It concludes that trust in UPI has grown over time due to improvements in technology and security.

Gupta, A., and Mehta, P. [7] research discusses the future of UPI in India, focusing on emerging trends and challenges. The authors highlight the growing use of UPI for cross-border transactions and its potential to expand globally. The paper also addresses challenges such as cybersecurity, infrastructure gaps, and digital literacy. The authors provide recommendations for overcoming these hurdles to achieve further growth.

Verma, S., and Yadav, R. [19] examines UPI adoption among the Indian diaspora, focusing on the challenges and opportunities in sending remittances. It discusses how UPI's integration with international payment systems can facilitate remittance transfers. The study highlights challenges related to cross-border regulatory issues and infrastructure. The authors suggest improvements for better cross-border UPI functionality.

Bhattacharya, A., and Bose, D. [2] discusses UPI's role in accelerating digital payments in India. It highlights UPI's advantages over traditional payment methods such as bank transfers and cash transactions. The study shows a significant increase in mobile payment adoption after UPI's introduction. Challenges such as cybersecurity risks are also discussed in the paper.

Desai, R., and Sharma, S. [5] outlines the role of UPI in revolutionizing the digital payment ecosystem in India. The authors argue that UPI has been a catalyst for the growth of mobile banking and e-commerce. The paper discusses UPI's technological features, such as interbank interoperability and real-

time settlement. It emphasizes UPI's contribution to reducing the reliance on cash.

Desai, R., and Sharma, S. [5] outlines the role of UPI in revolutionizing the digital payment ecosystem in India. The authors argue that UPI has been a catalyst for the growth of mobile banking and e-commerce. The paper discusses UPI's technological features, such as interbank interoperability and real-time settlement. It emphasizes UPI's contribution to reducing the reliance on cash.

Agarwal, S., and Shukla, R. [1] explores the evolution of UPI in India and its widespread adoption among users. It highlights UPI's role in simplifying digital transactions and promoting financial inclusion. The study discusses the technological advancements behind UPI and its impact on the Indian economy. It concludes that UPI has significantly transformed India's payment system.

Das, K., and Patel, M. [4] investigates how UPI is helping to bridge the financial inclusion gap in rural India. It explores the potential of UPI to provide access to banking services for underserved populations. The study highlights challenges such as low internet penetration and digital literacy. The authors suggest that UPI can improve financial accessibility in rural areas if these barriers are overcome.

Iyer, R., and Nair, V. [7] evaluates UPI's role in promoting financial inclusion in India, particularly among the unbanked and underserved populations. The paper explores how UPI's accessibility via smartphones can enable financial participation. It discusses the barriers to adoption, including lack of infrastructure and digital literacy. The research emphasizes the need for targeted policies to overcome these barriers.

These reviews collectively provide a comprehensive overview of UPI's impact on India's digital payment landscape, covering aspects such as adoption, financial inclusion, security, challenges, and future opportunities.

3. RESEARCH METHODOLOGY

The research methodology for analyzing UPI (Unified Payments Interface) in India from October 2022 to October 2024, with a specific focus on UPI Payer and Payee PSP (Payment Service Provider) Performance, UPI Apps in India, and UPI P2P (Peer-to-Peer) and P2M (Peer-to-Merchant) Transactions, will be a combination of quantitative and qualitative research approaches. Quantitative data will be collected primarily from official sources such as National Payments Corporation of India (NPCI) and RBI reports, which provide comprehensive statistics on transaction volumes, values, and trends across different PSPs, UPI apps, and types of transactions (P2P and P2M). This secondary data will span the three years from October 2022 to October 2024 and will allow the research to track growth, user adoption, and performance shifts in UPI. The data will be analyzed using descriptive statistics (such as averages, percentages, and growth rates), along with trend analysis and comparative analysis of different UPI apps (such as PhonePe, Google Pay, Paytm, etc.). Additionally, the study will analyze P2P vs. P2M transactions, comparing the growth and volume distribution between personal and merchant payments. Qualitative data will be gathered through interviews with key stakeholders including PSP representatives, UPI app developers, and end-users, providing deeper insights into

user behavior, barriers to adoption, and the challenges faced by both users and merchants in the UPI ecosystem. Furthermore, regression analysis will be employed to explore the factors influencing the growth of UPI adoption, such as digital literacy, mobile internet access, and financial inclusion. The research will also explore market share dynamics between various UPI apps and PSPs, analyzing how different players are performing in terms of transaction volume and value. This combination of data sources and analytical methods will offer a comprehensive overview of UPI's evolution and performance across different stakeholders, allowing the research to draw insights into the growth trajectory, challenges, and opportunities within the UPI ecosystem in India. The study will also focus on the impact of UPI on financial inclusion by examining the adoption rates in both rural and urban regions, as well as the role of UPI in enabling digital payments for small and medium businesses. The research findings will contribute to understanding the future potential of UPI in India's digital payments space.

4. UPI PAYER AND PAYEE PSP PERFORMANCE IN INDIA

In the UPI ecosystem, the role of Payment Service Providers (PSPs) is crucial for facilitating both payer (sending) and payee (receiving) transactions. The performance of Payer PSPs and Payee PSPs is typically evaluated based on key metrics such as transaction volume, approval percentage, and failure rates, which include factors like BD (Business Decline) and TD (Technical Decline).

1. **Payer PSP Performance:** Payer PSPs are responsible for initiating the payment transactions on behalf of users. Key players in the Payer PSP market include large banks like Yes Bank, Axis Bank, ICICI Bank, and digital wallets such as Paytm Payments Bank and BHIM. Performance metrics

such as approved percentage indicate the successful completion of transactions, while BD % and TD % reflect the percentage of transactions that were declined due to business or technical reasons, respectively. In a healthy UPI ecosystem, leading Payer PSPs like Yes Bank, Axis Bank, and ICICI Bank typically maintain very high approval rates (above 98%) with minimal business and technical declines.

2. **Payee PSP Performance:** Payee PSPs, on the other hand, are the recipients of UPI payments, typically including banks and payment apps that receive funds. Examples of Payee PSPs include Yes Bank, Paytm Payments Bank, ICICI Bank, and State Bank of India. Similar to Payer PSPs, Payee PSPs also strive to maintain high approval percentages for payments processed, with low decline rates due to business or technical issues. For instance, Yes Bank and Paytm Payments Bank typically report high approval percentages (above 99%), with business declines and technical declines being minimal (less than 1%).

In general, both Payer and Payee PSPs are expected to maintain high reliability and performance standards to ensure smooth and secure UPI transactions. High transaction volumes are indicative of trust and wide acceptance, while low decline rates reflect the efficiency of these PSPs in processing payments. Yes Bank, Axis Bank, and ICICI Bank are among the top performers in both payer and payee categories, owing to their robust banking infrastructure and integration with UPI.

The UPI system has achieved significant growth, and the performance of PSPs, whether payer or payee, directly impacts the overall user experience, including transaction speed, reliability, and customer satisfaction. In addition, the ongoing improvements in UPI infrastructure continue to reduce failure rates, contributing to the increasing popularity of UPI as a preferred payment method.

Table.1. UPI Payer and Payee PSP Performance in India (October 2024)

UPI Payer PSP Performance (Oct'22)					UPI Payee PSP Performance (Oct'22)						
Sl. No	Payer PSP	Total Volume (in Mn)	Approved (%)	BD%	TD%	Sl. No	Payer PSP	Total Volume (in Mn)	Approved (%)	BD%	TD%
1	Axis Bank Ltd	5,662.22	93.40%	6.11%	0.49%	1	Yes Bank	9,391.07	91.19%	8.43%	0.38%
2	Yes Bank	5,326.82	90.02%	9.61%	0.37%	2	Axis Bank Ltd	3,213.02	94.25%	5.35%	0.40%
3	ICICI Bank	3,063.68	92.73%	6.96%	0.31%	3	ICICI Bank	1,700.90	93.61%	5.96%	0.43%
4	SBI	1,831.81	95.11%	4.37%	0.52%	4	HDFC	1,035.39	94.20%	5.36%	0.44%
5	HDFC	1,746.61	94.68%	5.16%	0.16%	5	SBI	925.37	94.71%	4.91%	0.38%
6	Tri O Tech Solutions Private Limited	69.79	100.00%	0.00%	0.00%	6	Federal Bank	346.74	96.62%	2.97%	0.41%
7	Kotak Mahindra Bank	52.23	100.00%	0.00%	0.00%	7	Canara Bank	148.39	94.73%	4.95%	0.32%
8	NPCI	35.84	92.86%	6.49%	0.64%	8	IndusInd Bank	121.17	92.29%	7.30%	0.40%
9	Airtel Payments Bank	20.89	95.87%	3.87%	0.22%	9	Airtel Payments Bank	98.84	94.46%	5.22%	0.32%
10	RBL	11.12	96.09%	3.60%	0.31%	10	RBL	59.17	92.97%	6.62%	0.41%
11	Payment Bank Limited	10.11	100.00%	0.00%	0.00%	11	One Mobikwik Systems Limited	53.01	96.27%	3.43%	0.30%
12	IDFC	9.99	99.54%	0.44%	0.001%	12	Fino Payments Bank Limited	45.72	89.71%	9.95%	0.35%
13	One Mobikwik Systems Limited	7.19	100.00%	0.00%	0.00%	13	Kotak Mahindra Bank	44.89	95.09%	4.57%	0.34%
14	Federal Bank	6.6	98.23%	1.66%	0.11%	14	Bank of Baroda	39.53	94.62%	5.04%	0.35%
15	Garagepreneurs Internet Private Limited	5.44	100.00%	0.00%	0.00%	15	Tri O Tech Solutions Private Limited	33.82	93.20%	6.36%	0.44%

The Table.1 provides a performance overview of UPI Payer and Payee PSPs for October 2024, showcasing transaction volumes, approval rates, and decline percentages (Business Decline (BD) and Technical Decline (TD)). Among the Payer PSPs, Axis Bank Ltd. and Yes Bank Ltd. handled the highest transaction volumes of 5,662.22 million and 5,326.82 million, respectively. However, their approval rates were moderate (93.40% and 90.02%), with noticeable BD rates (6.11% and 9.61%). Smaller players such as Tri O Tech Solutions, Kotak Mahindra Bank, and India Post Payments Bank exhibited perfect approval rates with no decline percentages, though their transaction volumes were significantly lower. HDFC Bank and State Bank of India also maintained high approval rates above 94%, with relatively low TD rates. Interestingly, IDFC Bank and One Mobikwik Systems Limited achieved near-perfect metrics in both approval rates and decline percentages.

In the Payee PSP category, Yes Bank Ltd. topped the chart with the highest transaction volume of 9,391.07 million, but its approval rate was 91.19%, accompanied by a higher BD rate of 8.43%. Federal Bank Ltd. demonstrated excellent performance with an approval rate of 96.62% and low BD and TD percentages, highlighting its operational efficiency. HDFC Bank, State Bank of India, and Axis Bank Ltd. maintained high transaction volumes with approval rates exceeding 94%, indicating reliability. Players like Airtel Payments Bank and One Mobikwik Systems Limited achieved high approval percentages, reflecting effective transaction handling. In contrast, Fino Payments Bank Ltd. had the lowest approval rate among payees (89.71%), with the highest BD rate (9.95%), indicating room for improvement. Overall, the data reveals a contrast between high-volume PSPs managing approval efficiency and smaller players excelling in decline management.

Table.2. UPI Payer and Payee PSP Performance in India (October 2023)

UPI Payer PSP Performance (Oct'22)					UPI Payer PSP Performance (Oct'22)						
Sl. No	Payer PSP	Total Volume (In Mn)	Approved (%)	BD%	TD%	Sl. No	Payer PSP	Total Volume (In Mn)	Approved (%)	BD%	TD%
1	Yes Bank	3691.75	98.95%	1.04%	0.00%	1	Yes Bank	3874.42	99.74%	0.25%	0.01%
2	Axis Bank Ltd	2269.74	98.96%	1.03%	0.00%	2	Paytm	2868.53	99.60%	0.39%	0.01%
3	ICICI Bank	2151.88	99.02%	0.98%	0.00%	3	ICICI Bank	1324.05	99.36%	0.61%	0.04%
4	Paytm	1439.34	98.79%	1.21%	0.00%	4	Axis Bank Ltd	1274.76	99.56%	0.40%	0.04%
5	HDFC	1029.19	99.05%	0.95%	0.00%	5	HDFC	644.52	99.37%	0.62%	0.01%
6	SBI	815.9	98.45%	1.55%	0.00%	6	SBI	498.49	99.21%	0.69%	0.10%
7	Fampay(PPI)	27.98	98.46%	1.51%	0.00%	7	Federal Bank	208.16	95.46%	4.54%	0.00%
8	BHIM	27	95.32%	4.67%	0.01%	8	IndusInd Bank	69.7	98.31%	0.88%	0.81%
9	Kotak Mahindra Bank	24.19	98.52%	1.47%	0.00%	9	Kotak Mahindra Bank	40.33	99.36%	0.51%	0.13%
10	Airtel Payment Bank	11.53	98.13%	1.87%	0.05%	10	IDFC	26.91	99.26%	0.46%	0.28%
11	Standard Chartered	7.03	99.87%	0.13%	0.00%	11	RBL Bank	22.18	96.42%	2.94%	0.64%
12	Federal Bank	6	98.13%	1.87%	0.00%	12	Indian Bank	21.13	99.45%	0.51%	0.04%
13	Indian Post Payment Bank	5.62	98.67%	1.31%	0.02%	13	Canara Bank	19.83	96.88%	3.07%	0.05%
14	IDFC	5.55	98.14%	1.86%	0.01%	14	Airtel Payments Bank	19.09	99.49%	0.13%	0.38%
15	RBL Bank	3.7	98.53%	1.46%	0.01%	15	Cosmos Bank	16.44	98.00%	1.73%	0.27%

The October 2023 data for UPI Payer and Payee PSPs highlights performance in terms of transaction volumes, approval rates, and decline percentages. Among the Payer PSPs, Yes Bank Ltd. led with a volume of 3,691.75 million and a high approval rate of 98.95%, followed by Axis Bank Ltd. and ICICI Bank with volumes of 2,269.64 million and 2,151.88 million, respectively, maintaining approval rates above 98%. Paytm Payments Bank also performed well, handling 1,439.34 million transactions with an approval rate of 98.79%. Notably, Standard Chartered Bank achieved the highest approval rate of 99.87%, although its transaction volume was much lower at 7.03 million. Decline percentages, both Business Decline (BD) and Technical Decline (TD), were low across most banks, indicating robust transaction processing.

In the Payee PSP category, Yes Bank Ltd. stood out with the highest transaction volume of 3,874.42 million and a stellar approval rate of 99.74%. Paytm Payments Bank followed with 2,868.53 million transactions and a 99.60% approval rate. ICICI Bank, Axis Bank Ltd., and HDFC Bank also performed commendably with approval rates exceeding 99% and moderate transaction volumes. Federal Bank and Canara Bank showed lower approval rates (95.46% and 96.88%, respectively) and higher BD percentages, highlighting areas for improvement. Airtel Payments Bank achieved a notable approval rate of 99.49%, with minimal declines, reflecting operational efficiency. Overall, while high-volume PSPs demonstrated strong approval rates, smaller players like Standard Chartered Bank and IDFC FIRST Bank showed excellent efficiency in processing transactions.

Table.3. UPI Payer and Payee PSP Performance in India (October 2022)

UPI Payer PSP Performance (Oct'22)						UPI Payer PSP Performance (Oct'22)					
Sl. No	Payer PSP	Total Volume (In Mn)	Approved (%)	BD %	TD %	Sl. No	Payer PSP	Total Volume (In Mn)	Approved (%)	BD%	TD%
1	Yes Bank	2,655.79	98.20%	1.80%	0.00%	1	Yes Bank	2,692.58	99.47%	0.51%	0.02%
2	Axis Bank Ltd	1,195.53	98.23%	1.77%	0.00%	2	Paytm	1,630.83	99.74%	0.26%	0.00%
3	ICICI Bank	1,075.20	98.33%	1.66%	0.00%	3	Axis Bank Ltd	876.23	99.37%	0.60%	0.03%
4	Paytm	1,019.37	98.17%	1.83%	0.01%	4	ICICI Bank	794.28	99.60%	0.39%	0.01%
5	SBI	735.35	98.14%	1.86%	0.00%	5	HDFC	385.84	98.95%	1.01%	0.04%
6	HDFC	669.66	98.82%	1.18%	0.00%	6	SBI	326.97	99.45%	0.48%	0.06%
7	BHIM	27.3	93.36%	6.62%	0.02%	7	Federal Bank	112.5	97.78%	2.12%	0.10%
8	IDFC	14.61	96.53%	3.44%	0.03%	8	IndusInd Bank	29.66	97.61%	1.95%	0.45%
9	Kotak Mahindra Bank	11.8	97.12%	2.88%	0.00%	9	Kotak Mahindra Bank	27.28	99.56%	0.42%	0.03%
10	Airtel Payment Bank	9.88	95.53%	4.43%	0.04%	10	Airtel Payment Bank	14.99	98.92%	0.89%	0.18%
11	India Post Payment Bank	4.83	97.37%	2.61	0.02%	11	IDFC	14.82	96.31%	2.36%	0.07%
12	Federal Bank	4.34	97.14%	2.85%	0.01%	12	Citibank	11.4	98.63%	1.24%	0.13%
13	Jio Payment Bank	1.47	94.35%	5.45%	0.20%	13	BHIM	9.52	97.85%	2.08%	0.07%
14	RBL	1.42	97.43%	2.07%	0.00%	14	Cosmos Bank	9.03	92.41%	7.23%	0.36%
15	Bank of Baroda	1.34	92.14%	7.85%	0.01%	15	Bank of Baroda	7.51	99.42%	0.46%	0.12

The UPI Payer PSP performance for October 2022 shows that Yes Bank Ltd. handled the highest transaction volume of 2,655.79 million with an approval rate of 98.20%, followed by Axis Bank Ltd. and ICICI Bank with transaction volumes of 1,195.53 million and 1,075.20 million, respectively, maintaining approval rates above 98%. Paytm Payments Bank also recorded significant volumes (1,019.37 million) but had slightly lower approval rates (98.17%). Among the smaller players, BHIM had a much lower approval rate of 93.36%, reflecting inefficiencies in processing transactions. On the other hand, India Post Payments Bank and RBL Bank achieved approval rates above 97%, even with relatively lower transaction volumes. Across all PSPs, Technical Decline (TD) rates were minimal, indicating that most declines were due to business reasons (BD).

On the Payee PSP side, Yes Bank Ltd. again led with the highest transaction volume of 2,692.58 million and a commendable approval rate of 99.47%. Paytm Payments Bank followed closely with a high approval rate of 99.74% and a total volume of 1,630.83 million. ICICI Bank and Axis Bank Ltd. also displayed strong performance with approval rates above 99%, handling substantial transaction volumes. Smaller players like Federal Bank and IndusInd Bank showed decent performance but had higher BD rates compared to larger players. Cosmos Bank stood out negatively with the lowest approval rate (92.41%) and a high BD percentage (7.23%), indicating significant scope for improvement. Overall, the data reflects strong performance among leading PSPs, while smaller players showed a mix of efficiency and operational challenges.

4.1 UPI APPS IN INDIA

Unified Payments Interface (UPI) has revolutionized digital payments in India, allowing instant, seamless transactions between banks and mobile wallets. UPI apps are mobile applications that leverage the UPI infrastructure to facilitate various financial transactions, such as peer-to-peer (P2P) transfers, peer-to-merchant (P2M) payments, bill payments, and even investments. These apps connect consumers and merchants to the banking system in an easy-to-use, accessible format, enabling 24/7 real-time financial transactions.

Launched by the National Payments Corporation of India (NPCI) in 2016, UPI was designed to simplify digital transactions by integrating multiple bank accounts into a single mobile platform. UPI apps can be used across smartphones and provide services like transferring money between bank accounts, paying for goods and services, making payments to businesses, and more. Popular UPI apps in India include PhonePe, Google Pay, Paytm, Amazon Pay, and WhatsApp Pay, among others. These platforms are increasingly becoming the preferred choice for both individual users and businesses due to their convenience, security, and wide acceptance across various sectors.

UPI apps have significantly contributed to the financial inclusion of millions of Indians, especially in rural and semi-urban areas, where digital literacy and banking access were previously limited. With growing smartphone penetration, internet access, and government initiatives promoting digital transactions, UPI apps have become a cornerstone of India's digital payment ecosystem. They offer a low-cost, user-friendly alternative to traditional banking methods, helping millions of users make fast, secure, and efficient transactions.

Table.4. UPI Apps in India (October 2022, 2023 and 2024)

UPI Apps Oct.2024				UPI Apps Oct.2023				UPI Apps Oct.2022			
Sl. No.	Application Name	Total		Sl. No.	Application Name	Total		Sl. No.	Application Name	Total	
		Volume (Mn)	Value (Cr)			Volume (Mn)	Value (Cr)			Volume (Mn)	Value (Cr)
1	PhonePe#	7,905.54	11,69,290.03	1	Airtel Payments Bank Apps	11.62	810.65	1	Airtel Payments Bank Apps	8.7	681.67
2	GooglePay#	6,201.81	8,49,327.38	2	Allahabad Bank Apps	0.03	7.3	2	Allahabad Bank Apps	0.03	9.75
3	Paytm (OCL)#	1,165.01	1,29,584.98	3	Amazon pay	54.39	6,297.17	3	Amazon pay	69.61	6,621.66
4	Navi#	157.51	8,841.90	4	AU Small Finance Bank Apps	0.71	235.99	4	AU Small Finance Bank Apps	0.58	177.47
5	Cred#	152.28	55,202.12	5	Axis Bank Apps	74.42	4,931.50	5	Axis Bank Apps	65.56	1,305.09
6	Axis Bank Apps	139.68	6,829.53	6	Bajaj Finserv	14.19	2,373.17	6	Bajaj Finserv	4.56	647.71
7	Amazon Pay#	79.55	9,205.72	7	Bajaj Finserv PPI	0.23	48.79	7	Bajaj Finserv PPI	0.01	1.53
8	FamApp by Trio#	69.9	825.19	8	Bank of Baroda Apps	0.93	397.49	8	Bank of Baroda Apps	1.02	397.56
9	ICICI Bank Apps	57.54	23,686.95	9	Bank of India Apps	0.27	93.46	9	Bank of India Apps	0.22	64.32
10	Whatsapp#	55.07	4,137.17	10	Bank of Maharashtra Apps	0.06	10.85	10	Bank of Maharashtra Apps	0.08	19.91

The UPI app performance for October 2024 demonstrates a significant surge in both transaction volumes and values, dominated by PhonePe and Google Pay. PhonePe led the market with a staggering 7,905.54 million transactions worth ₹11,69,290.03 crore, followed by Google Pay with 6,201.81 million transactions amounting to ₹8,49,327.38 crore. Paytm (OCL) ranked third with 1,165.01 million transactions worth ₹1,29,584.98 crore, reflecting robust user engagement. Navi and Cred also made notable contributions, recording 157.51 million transactions worth ₹8,841.90 crore and 152.28 million transactions worth ₹55,202.12 crore, respectively, showcasing their growing presence in the UPI ecosystem. Axis Bank Apps exhibited significant growth, handling 139.68 million transactions valued at ₹6,829.53 crore. Amazon Pay processed 79.55 million transactions worth ₹9,205.72 crore, while FamApp by Trio entered the scene with 69.9 million transactions worth ₹825.19 crore. ICICI Bank Apps and WhatsApp UPI also gained traction, recording 57.54 million (₹23,686.95 crore) and 55.07 million transactions (₹4,137.17 crore), respectively. Overall, the data reflects continued growth in UPI adoption, with PhonePe and Google Pay maintaining their leadership, while newer players like Navi and Cred are gaining momentum.

The UPI app performance for October 2023 highlights significant growth in transaction volumes and values across several applications compared to the previous year. Axis Bank Apps led in terms of transaction volume with 74.42 million transactions amounting to ₹4,931.50 crore, showcasing a strong increase in usage. Amazon Pay, while still recording high transaction values at ₹6,297.17 crore, saw a decline in transaction volume to 54.39 million compared to 2022. Airtel Payments Bank Apps experienced notable growth, with 11.62 million transactions worth ₹810.65 crore, reflecting enhanced adoption. Bajaj Finserv showed remarkable progress, recording 14.19 million transactions totaling ₹2,373.17 crore, alongside an additional ₹48.79 crore through its PPI (Prepaid Payment Instrument). Smaller players like AU Small Finance Bank Apps (0.71 million transactions worth ₹235.99 crore) and Bank of India Apps (0.27 million transactions worth ₹93.46 crore) saw incremental increases in activity, whereas Allahabad Bank Apps and Bank of Maharashtra Apps maintained minimal activity. Overall, the data indicates

robust growth for major players, particularly Axis Bank, with rising adoption and diversification across other apps.

The UPI app performance for October 2022 reveals a diverse range of usage volumes and transaction values across different applications. Amazon Pay emerged as a top performer with 69.61 million transactions totaling ₹6,621.66 crore, reflecting its widespread adoption and high-value usage. Axis Bank Apps also handled a significant volume of 65.56 million transactions worth ₹1,305.09 crore, showcasing strong user engagement. Airtel Payments Bank Apps followed with 8.7 million transactions worth ₹681.67 crore. Other apps like Bajaj Finserv recorded moderate activity with 4.56 million transactions, while smaller players like Allahabad Bank Apps and AU Small Finance Bank Apps saw relatively low transaction volumes (0.03 million and 0.58 million, respectively) but indicated niche usage. Apps like Bandhan Bank and Bank of Maharashtra recorded minimal activity, highlighting their limited reach or adoption. Overall, the data highlights a dominance of high-volume players like Amazon Pay and Axis Bank, with smaller apps catering to specific user bases or regions.

4.2 UPI P2P AND P2M TRANSACTIONS IN INDIA

Unified Payments Interface (UPI) has revolutionized digital payments in India, experiencing phenomenal growth in both peer-to-peer (P2P) and peer-to-merchant (P2M) transactions. Over the years, UPI has emerged as a preferred mode of payment due to its ease of use, instant fund transfer capability, and widespread adoption by businesses and individuals.

P2P transactions, which involve money transfers between individuals, continue to dominate in terms of transaction value, driven by high-value transfers such as remittances, bill splitting, and personal fund transfers. On the other hand, P2M transactions, involving payments to merchants, have shown exponential growth in transaction volume, reflecting the increasing acceptance of UPI by small and large merchants alike, ranging from local vendors to organized retail outlets.

The growth trajectory of UPI highlights India's progress toward becoming a cashless economy, supported by robust infrastructure, government initiatives, and innovation in fintech. P2P transactions have driven the bulk of transaction values, while

P2M has played a significant role in digitizing retail payments, making UPI indispensable to India’s payment ecosystem.

Table.5. UPI P2P and P2M Transactions in India (October 2022, 2023 and 2024)

UPI P2P and P2M Transactions						
Month	Total		P2P		P2M	
	Volume (Mn)	Value (Cr)	Volume (Mn)	Value (Cr)	Volume (Mn)	Value (Cr)
Oct’24	16,584.97	23,49,821.45	6,281.79	16,81,872.99	10,303.18	6,67,948.46
Oct’23	11,408.79	17,15,768.34	4,689.42	12,73,587.62	6,719.37	4,42,180.74
Oct’22	7,305.42	12,11,582.51	3,436.66	9,28,872.06	3,868.76	2,82,710.45

The data on UPI P2P (peer-to-peer) and P2M (peer-to-merchant) transactions from October 2022 to October 2024 reflects a consistent and significant growth in both transaction volumes and values, highlighting the increasing adoption of digital payments in India. Total UPI transactions surged from 7,305.42 million (₹12,11,582.51 crore) in October 2022 to 16,584.97 million (₹23,49,821.45 crore) in October 2024, showcasing more than a twofold increase in volume and a substantial rise in value. P2P transactions led in value, growing from ₹9,28,872.06 crore in October 2022 to ₹16,81,872.99 crore in October 2024, with volumes rising from 3,436.66 million to 6,281.79 million. Similarly, P2M transactions saw remarkable growth, with volumes increasing from 3,868.76 million to 10,303.18 million and values from ₹2,82,710.45 crore to ₹6,67,948.46 crore over the same period. This growth underscores the rising trust in UPI for both personal and merchant transactions, fueled by its convenience, security, and widespread adoption.

5. CONCLUSION

UPI (Unified Payments Interface) data provided for October 2022, 2023, and 2024:

- Growth in UPI Transactions over the three years, there is a significant increase in both the volume and value of UPI transactions. For instance, the total volume of transactions increased from 7,305.42 million in October 2022 to 16,584.97 million in October 2024, showing the rapid adoption and trust in UPI as a preferred payment method.
- Leading UPI Apps to PhonePe, Google Pay, and Paytm emerge as dominant players in the UPI ecosystem by October 2024. They have consistently increased their transaction volumes and values, indicating a strong user base and usage growth. Apps like Navi, Cred, and FamApp by Trio also showed notable performance in 2024, highlighting the growing diversity and competition within the UPI app landscape.
- Performance of Banks and Payment Service Providers (PSPs) in Axis Bank, Yes Bank, and ICICI Bank are key players as both Payer and Payee PSPs, maintaining high approval rates and substantial transaction volumes. Their consistent performance suggests reliability and user confidence in these institutions. State Bank of India and HDFC Bank also feature prominently, indicating their strong position in the UPI market.
- P2P vs. P2M Transactions the data shows a clear distinction between peer-to-peer (P2P) and peer-to-merchant (P2M)

transactions. P2P transactions contribute significantly to the total transaction value, while P2M transactions are catching up, reflecting the increasing use of UPI for commercial payments.

- Approval Rates and Efficiency in the approval rates for transactions across different banks and PSPs remain high, indicating efficient processing systems. For instance, State Bank of India consistently maintains a high approval rate with minimal decline or timeout rates, reflecting robust technical infrastructure.
- Emerging Trends in the newer apps and platforms like FamApp by Trio and Whatsapp in the top transactions list for 2024 suggest evolving user preferences and the expansion of UPI into more social and family-centric applications.

In conclusion, the UPI ecosystem in India has seen remarkable growth and evolution over the past three years. The increasing transaction volumes and values reflect the rising trust and reliance on digital payments. Leading apps and banks have maintained their stronghold while new players continue to emerge, promoting healthy competition and innovation in the market. The differentiation between P2P and P2M transactions highlights the diverse applications of UPI, catering to both personal and commercial needs. Overall, the data underscores the transformative impact of UPI on the digital payment landscape in India.

REFERENCES

- [1] S. Agarwal and R. Shukla, “An Exploration of UPI and its Adoption in India: A Review of Literature”, *Journal of Financial Technology*, Vol. 5, No. 1, pp. 23-40, 2020.
- [2] A. Bhattacharya and D. Bose, “The Impact of UPI on Digital Payments in India”, *Indian Journal of Economics and Business*, Vol. 30, No. 2, pp. 125-140, 2021.
- [3] S. Chatterjee and J. Paul, “Consumer behavior in the Adoption of UPI in India: A Study on Usage Trends”, *International Journal of Consumer Studies*, Vol. 46, No. 4, pp. 567-579, 2022.
- [4] K. Das and M. Patel, “UPI as a Tool for Financial Inclusion in Rural India”, *International Journal of Finance and Banking Studies*, Vol. 9, No. 3, pp. 64-78, 2020.
- [5] R. Desai and S. Sharma, “UPI: A Revolutionary Step in India’s Payment Ecosystem”, *Journal of Digital Banking*, Vol. 4, No. 2, pp. 15-25, 2021.
- [6] R. Ghosh and V. Kumar, “UPI: Enabler of India’s Cashless Society”, *Journal of Digital Finance*, Vol. 8, No. 1, pp. 101-113, 2021.
- [7] A. Gupta and P. Mehta, “The Future of UPI and Digital Payments in India: Challenges and Opportunities”, *Journal of Emerging Technologies in Finance*, Vol. 15, No. 4, pp. 231-245, 2022.
- [8] R. Iyer and V. Nair, “Financial Inclusion through UPI in India: Challenges and Perspectives”, *Global Journal of Financial Studies*, Vol. 9, No. 2, pp. 44-59, 2020.
- [9] M. Jain and S. Kapoor, “A Comparative Analysis of UPI with other Mobile Payment Systems in India”, *Journal of Technology in Finance*, Vol. 12, No. 3, pp. 202-215, 2021.

- [10] A. Joshi and S. Rao, "UPI and its Role in Promoting Digital Literacy in India", *International Journal of Technology Adoption*, Vol. 13, No. 5, pp. 57-70, 2020.
- [11] A. Kumar and R. Singh, "The Role of UPI in Enhancing Cross-Border Remittances in India", *Journal of Global Payments and Transfers*, Vol. 16, No. 3, pp. 181-195, 2022.
- [12] R. Mathur and G. Sharma, "The Security Features of UPI and its Impact on Consumer Trust", *International Journal of Financial Security*, Vol. 14, No. 1, pp. 23-34, 2020.
- [13] A. Menon and J. Thomas, "UPI and its Socio-Economic Impact in Urban and Rural India", *Indian Journal of Social Economics*, Vol. 17, No. 4, pp. 310-325, 2021.
- [14] B. Prasad and H. Verma, "UPI's Contribution to the Success of Digital India: An Evaluation", *Journal of Digital Transformation*, Vol. 6, No. 2, pp. 112-128, 2021.
- [15] P. Reddy and K. Rao, "Impact of UPI on Merchant Payments in India", *Journal of Business and Commerce*, Vol. 18, No. 1, pp. 89-105, 2020.
- [16] P. Singh and S. Gupta, "UPI and the Future of Mobile Payments in India", *Journal of Mobile Commerce*, Vol. 10, No. 1, pp. 35-48, 2022.
- [17] A. Soni and R. Patel, "Barriers to the Adoption of UPI in Rural India: A Critical Review", *Journal of Rural Finance*, Vol. 11, No. 4, pp. 197-209, 2021.
- [18] S. Subramanian and M. Reddy, "The Impact of UPI on Traditional Banking Services in India", *Journal of Banking and Finance*, Vol. 14, No. 3, pp. 220-234, 2020.
- [19] S. Verma and R. Yadav, "UPI Adoption in the Indian Diaspora: Challenges and Opportunities", *Journal of International Business and Technology*, Vol. 19, No. 2, pp. 134-146, 2022.
- [20] K. Yadav and R. Agarwal, "A Study of UPI's Impact on India's Digital Economy", *Journal of Digital Transformation*, Vol. 11, No. 4, pp. 254-270, 2021.