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Kandlakoya (V), Medchal, Hyderabad – 501401



The Study on the Growth and Adaption of UPI Payments In India

P Alekhya

Professor, Department of MBA,
CMR COLLEGE OF ENGINEERING & TECHNOLOGY,
Hyderabad, alekhya0601@gmail.com

P Akhila

Assistant Professor, Department of MBA,
CMR COLLEGE OF ENGINEERING & TECHNOLOGY,
Hyderabad, p.akhila@cmrcet.ac.in

ABSTRACT

The research explores several factors that have contributed to UPI's widespread adoption. These include the government's push toward a cashless economy through initiatives like Digital India, the growing penetration of smartphones and internet connectivity, and the innovative role of fintech platforms such as Google Pay, PhonePe, and Paytm. Additionally, the COVID-19 pandemic played a significant role in accelerating the use of contactless digital payments, further boosting UPI's growth. The study also analyzes usage patterns, demographic reach, and transaction volumes to understand its impact across urban and rural sectors.

Keywords: Unified Payments Interface (UPI), Digital Payments, Financial Inclusion, Fintech Adoption

1. INTRODUCTION

India's journey toward a digital economy has been nothing short of transformative, and at the heart of this change is the Unified Payments Interface, or UPI. Introduced by the National Payments Corporation of India (NPCI) in 2016, UPI has reshaped the way people transfer money—offering a fast, secure, and user-friendly way to send and receive funds directly between bank accounts using mobile devices.

What makes UPI stand out is its simplicity and accessibility. With just a smartphone and a mobile number or virtual payment address, users can make real-time payments anytime, anywhere. Its ability to work seamlessly across different banks and apps has made it incredibly popular, not only for personal transactions but also for everyday business payments.

Several factors have contributed to UPI's rapid rise. The government's push for a cashless economy through the Digital India campaign, the growing use of smartphones and affordable internet, and the innovative services offered by fintech

platforms like Google Pay, PhonePe, Paytm, and BHIM have all played a role. The COVID-19 pandemic further accelerated this shift, as more people turned to contactless digital payments for safety and convenience.

One of the most notable achievements of UPI is its contribution to financial inclusion. By lowering entry barriers and simplifying the transaction process, UPI has brought millions of unbanked and underbanked individuals into the formal financial system. Even in remote and rural areas, people can now pay bills, transfer money, and access digital services without relying on traditional banking infrastructure.

In terms of scale, UPI has witnessed exponential growth. Monthly transaction volumes have crossed billions, and the platform has become a global case study for interoperable digital payments. UPI's success has even inspired other countries to explore similar frameworks, positioning India as a leader in fintech innovation.

However, the journey has not been without challenges. Issues like digital illiteracy, data privacy concerns, cybersecurity threats, and uneven internet access in certain regions continue to pose obstacles to the platform's universal adoption. Additionally, with the growing volume of transactions, maintaining the integrity, speed, and security of the system is more important than ever.

This study aims to explore the evolution of UPI in India, analyze the key drivers behind its widespread adoption, and assess its overall impact on the economy. It also seeks to highlight the gaps and risks associated with its usage and propose solutions that can ensure long-term sustainability. As UPI continues to evolve, understanding its trajectory offers valuable insights into the future of digital finance in India.

2. REVIEW OF LITERATURE

Deloitte (2020) Deloitte's analysis highlighted UPI's transformative impact on bringing small businesses and informal sectors into the digital fold. The study linked UPI's adoption to broader financial inclusion efforts, especially in Tier II and Tier III cities.

Joshi & Agarwal (2020) This academic paper analyzed consumer perceptions toward UPI adoption. The study found that trust, ease of use, and transaction speed were key factors influencing UPI usage, while security concerns remained a barrier among older and less tech-savvy users.

NITI Aayog (2019) NITI Aayog discussed UPI as a critical component of India's digital infrastructure. The report highlighted the role of the government's Digital India campaign and Aadhaar-Enabled Payment Systems (AEPS) in accelerating UPI adoption.

Reserve Bank of India (RBI) Bulletins (2017–2023) RBI's periodic financial stability reports and bulletins emphasized the need for regulatory frameworks to keep pace with the rapid growth of digital payments. UPI was acknowledged as a tool that brought operational efficiency to banks and improved access to real-time fund transfers for customers.

Singh & Sharma (2021) This paper focused on the behavioral aspects of digital payment users. The findings indicated a generational divide in digital adoption, with millennials showing the highest acceptance of UPI, influenced by mobile app UI/UX and cashback incentives.

Harshal Devetal. (2024) This study examined UPI's impact on individual spending behavior, finding that approximately 75% of participants reported increased spending due to UPI. The study also provided design recommendations for UPI app developers to enhance user experience.

Reuters (2024) The Reserve Bank of India (RBI) plans to expand access to its central bank digital currency (CBDC), e-rupee, beyond banks by including non-bank payment system operators such as third-party payment app providers like PhonePe, Google Pay, and Paytm. This move aims to increase the retail user base and transaction volumes by offering the e-rupee through CBDC wallets.

Economic Times (2025) In May 2025, UPI processed 18.68 billion transactions, marking a 4.4% increase from the previous month. This growth indicates a rebound after a dip in transaction volume observed in April, reflecting renewed momentum in the use of digital payment systems across India.

RESEARCH GAP:

While a lot has been written about the rise of UPI and its role in shaping India's digital payment landscape, much of that research is now slightly dated. UPI has evolved rapidly, especially in the last couple of years, with new features like credit integration, international usage, and growing involvement of third-party apps like Google Pay and PhonePe. However, these newer developments haven't been fully explored in recent studies.

Additionally, most existing research focuses on urban users, leaving a deeper understanding of how UPI is being used — or not used — in rural and semi-urban areas, where issues like digital literacy and infrastructure still matter a lot. There's also a noticeable lack of insight into the human side of adoption: what builds trust, what causes hesitation, and how user experiences differ across demographics. These gaps make it clear that there's a need for updated people-focused research that reflects how UPI fits into the everyday lives of Indians today.

3 OBJECTIVES OF THE STUDY

1. To analyze the year-on-year growth in UPI transaction volume and value from 2019 to 2024.
2. To compare UPI usage with other digital payment modes such as NEFT, RTGS, IMPS, and digital wallets.

4. HYPOTHESES OF THE STUDY

Null Hypothesis (H_0): There is no significant growth in the volume and value of UPI transactions in India between 2019 and 2024.

Alternative Hypothesis (H_1): There is a significant growth in the volume and value of UPI transactions in India between 2019 and 2024.

Null Hypothesis (H_0): There is no significant difference in the usage (transaction volume or value) between UPI and other digital payment modes (NEFT, RTGS, IMPS, and digital wallets).

Alternative Hypothesis (H_1): There is a **significant difference** in the usage (transaction volume or value) between UPI and other digital payment modes (NEFT, RTGS, IMPS, and digital wallets).

5. SCOPE OF THE STUDY

This study focuses on analyzing the growth trajectory and adoption patterns of the Unified Payments Interface (UPI) in India from its inception in 2016 to the present day. It covers the technological, economic, and social factors that have influenced UPI's development and its role in transforming India's digital payment landscape. The research specifically examines trends in transaction volumes, user demographics, platform usage (e.g., Google Pay, PhonePe, Paytm, BHIM), and sector-wise adoption across both urban and rural regions.

The study also explores the role of government policies, regulatory frameworks, and initiatives like Digital India in promoting UPI adoption. It aims to understand how fintech companies and banks have contributed to innovation and integration within the UPI ecosystem. Furthermore, it assesses the impact of external factors—such as the COVID-19 pandemic—on consumer behavior and the shift toward digital and contactless transactions.

While the research provides a comprehensive view of UPI's success, it is limited to secondary data sources, published reports, and case studies available within the Indian context. It does not include a primary survey or detailed technical analysis of the UPI system architecture. The study aims to offer valuable insights for policymakers, financial institutions, fintech firms, and researchers interested in India's digital transformation journey.

6. NEED OF THE STUDY

The rapid rise of **Unified Payments Interface (UPI)** has transformed how people in India handle everyday transactions — from buying groceries to paying bills or transferring money to friends and family. With UPI becoming the most widely used digital payment method in the country, it's important to understand why and how this shift is happening.

Most of the existing research either focuses on technical aspects or provides outdated data that no longer reflects UPI's current scope. In a time when **digital payments are shaping financial inclusion, consumer behavior, and even the informal economy**, there is a strong need for an updated and more people-centered study. This research will help fill that gap by looking at both the **growth trends** and the **human experiences** behind UPI's success, offering insights that can benefit policymakers, financial institutions, app developers, and everyday users alike.

7 RESEARCH METHODOLOGY

Research Design:

The research design employed in this study was quantitative in nature. For this study, most of the information comes from reliable secondary sources to paint a clear picture of UPI's growth in India. The National Payments Corporation of India (NPCI) provides detailed data on transaction volumes and user trends, which helps track how UPI has expanded over time. Reports from the Reserve Bank of India (RBI) shed light on the policies and regulations that have shaped the digital payments landscape. Government initiatives like Digital India and Jan Dhan Yojana also play a big role, so their documents help us understand how the government has encouraged people to adopt UPI. To get a fuller view, we also look at fintech industry reports and market research that highlight new innovations and how consumers and merchants are responding. Lastly, trusted news stories and case studies add context by showing real-life examples and recent developments in the UPI ecosystem.

Data Period:

The study will use data for the period from **2019 to 2024** to analyze the growth trajectory and adoption trends of UPI in India. This timeframe captures key developments, including the impact of the COVID-19 pandemic and the post-pandemic surge in digital payment usage.

STATISTICAL TOOLS

Descriptive Statistics

Descriptive statistics summarize and organize data to provide a clear overview of key patterns. For analyzing year-on-year growth in UPI transaction volume and value, descriptive statistics help by calculating measures like mean, median, mode and standard deviation. These summaries make it easier to understand the overall growth behavior over the period from 2019 to 2024.

Comparative Statistics

Comparative analysis for this objective involves evaluating and contrasting the usage patterns of UPI with other digital payment modes like NEFT, RTGS, IMPS, and digital wallets. It focuses on comparing key metrics such as transaction volume and value over time. This helps identify which mode is more widely adopted and how their growth trends differ.

8. LIMITATION OF THE STUDY

- The study relies heavily on secondary data from sources like NPCI, RBI, and government reports, which may have reporting delays or data inconsistencies.
- Since primary data collection is limited or absent, the study may not fully capture individual user experiences, perceptions, or challenges related to UPI usage.
- The digital payments landscape evolves quickly, so findings based on data up to 2024 might become outdated due to emerging technologies or policy changes.
- Some regional or demographic-specific data might be unavailable or incomplete, limiting detailed analysis of UPI adoption across different user groups.

9. DATA ANALYSIS

Objective 1: To analyze the year-on-year growth in UPI transaction volume and value from 2019 to 2024.

- Independent variable: Year (2019 to 2024)
- Dependent Variable: UPI Transaction Volum, UPI Transaction Value

Descriptive Statistics: Descriptive statistics summarize data using measures like mean, median, and standard deviation. They help understand patterns and variation in a dataset.

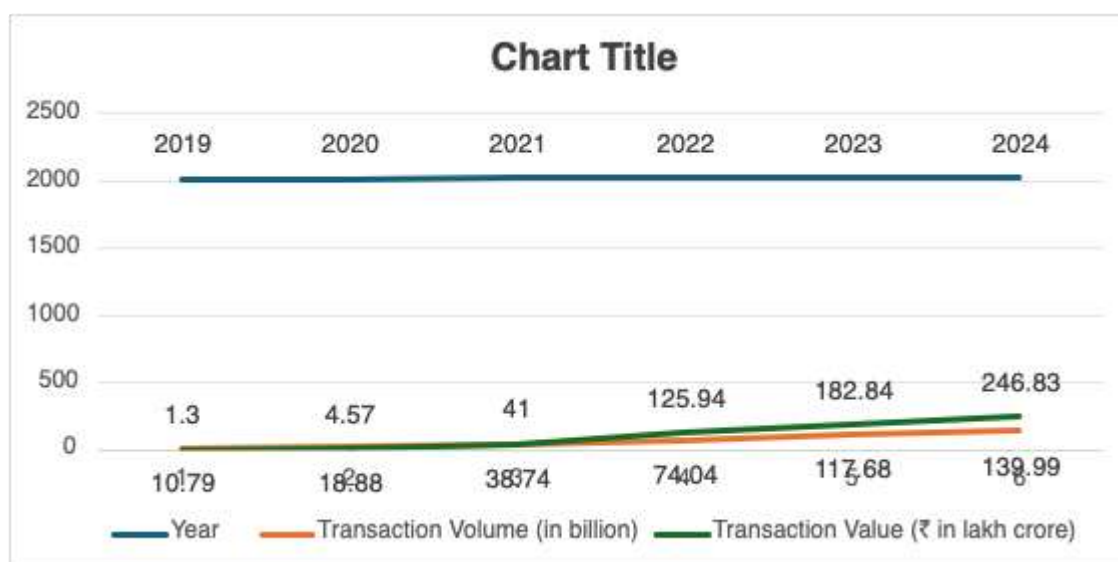
Table 1: Growth of UPI Transaction Volume and Value from 2019-2024

Year	Transaction Volume (in billion) (Growth)	Transaction Value (₹ in lakh crore)
2019	10.79	1.3
2020	18.88	4.57
2021	38.74	41
2022	74.04	125.94
2023	117.68	182.84
2024	139.99	246.83

Source: Compiled Data

Between 2019 and 2024, UPI saw a remarkable rise in both the number and value of transactions, reflecting how deeply it has become embedded in the daily lives of Indians. Transaction volumes jumped from just over 10 billion in 2019 to nearly 140 billion by 2024, while the value of those transactions soared from ₹1.3 lakh crore to an estimated ₹246.83 lakh crore. This explosive growth was driven by factors like increasing smartphone access, affordable mobile data, and the push for digital payments through initiatives such as Digital India. The pandemic years accelerated this shift even further, as people and businesses turned to contactless payment options. In recent years, while the growth has continued, it's showing signs of stabilizing—a sign that UPI is no longer just a rising trend but a firmly established part of India's financial ecosystem

Graph:1 Growth of UPI Transaction Volume and Value from 2019-2024



Source: Compiled Data

The chart illustrates the growth of digital transactions in India from 2019 to 2024, showcasing both the transaction volume (in billions) and transaction value (in ₹ lakh crore) over these years.

In 2019, the transaction volume stood at 1.3 billion with a value of ₹10.79 lakh crore. This grew steadily, reaching 4.57 billion and ₹18.38 lakh crore in 2020. By 2021, the volume sharply increased to 41 billion, and the value rose to ₹38.74 lakh crore. In 2022, there was a substantial rise in volume to 125.94 billion and in value to ₹74.04 lakh crore. The upward trend continued in 2023 with 182.84 billion transactions valued at ₹117.68 lakh crore. Finally, in 2024, the volume peaked at 246.83 billion, while the transaction value reached ₹139.99 lakh crore.

This data demonstrates a strong and consistent rise in both the number and value of digital transactions over the six-year period, highlighting rapid digital payment adoption in the country. Note that the chart lacks a proper title, which would help in immediately identifying the subject of the data presented.

The chart shows a sharp and consistent increase in both UPI transaction volume (from 1.3 billion to 246.83 billion) and value (from ₹10.79 lakh crore to ₹139.99 lakh crore) between 2019 and 2024.

This clear upward trend indicates significant year-on-year growth, leading to rejection of the null hypothesis and acceptance of the alternate hypothesis.

Statistic	Transaction Volume	Transaction Value
Mean	66.6867	100.4133
Median	56.39	83.47
Standard Deviation	53.3267	101.413

Source: compiled Data

The descriptive statistics show a **strong upward trend** in both UPI transaction volume and value from 2019 to 2024, with high means and medians. The large standard deviations indicate **rapid growth and high variability** in usage over the years.

Objective 2: To compare UPI usage with other digital payment modes such as NEFT, RTGS, IMPS, and digital wallets.

Independent Variable: Mode of Digital Payment (UPI, NEFT, RTGS, IMPS, Digital Wallets)

Dependent Variable: Transaction Volume, Transaction Value

Comparative Statistics: Comparative statistics compare data between groups to highlight differences. They help analyze usage across various digital payment modes.

Table:2 Comparative Analysis of Digital Payment Modes in India (2019–2024)

Year	UPI Volume (Crore Txns)	UPI Value (₹ Lakh Crore)	UPI Share of Digital Volume (%)	IMPS Avg Monthly Value (₹ Crore)	IMPS Annual Value (₹ Lakh Crore)	NEFT/RTGS + Other Modes Volume Share (%)
2019	1,078.80	21.3	34%	21,819	2.62	66%
2020	1,888.10	32.9	45%	26,838	3.22	55%
2021	3,874.50	73.5	60%	29,324	3.52	40%
2022	7,404.40	126.9	71%	49,346	5.92	29%
2023	11,767.60	182.84	78%	61,908	7.43	22%
2024	13,999.60	246.83	83%	70,709	8.49	17%

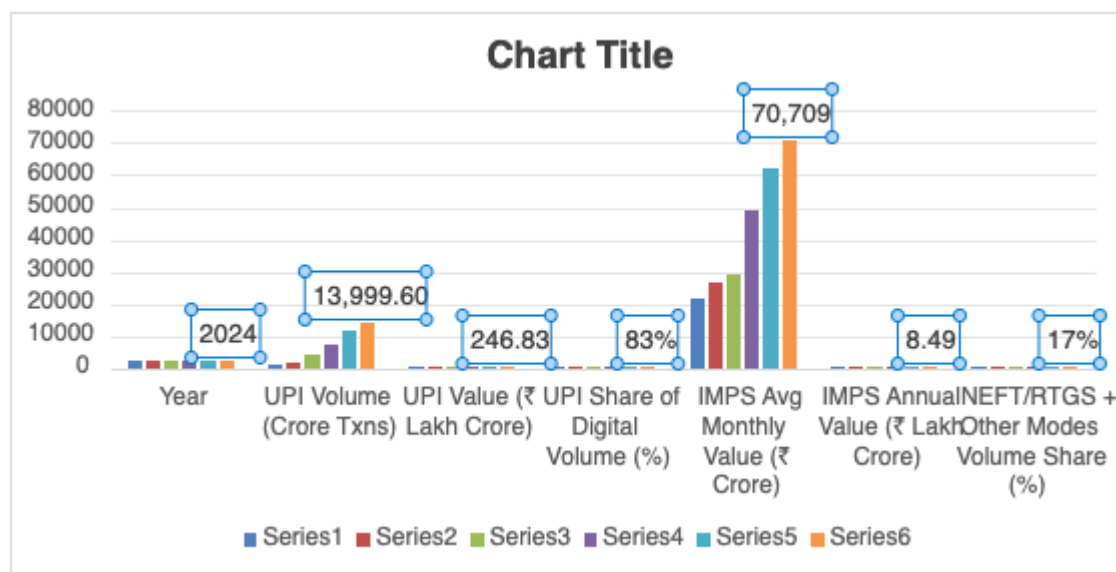
Source: Compiled Data

The data clearly illustrates a transformative shift in India's digital payment landscape, with **UPI emerging as the dominant mode** of transactions. Over six years, UPI transaction volume grew more than **thirteenfold**, and the transaction value increased by more than **eleven times**, reflecting not only widespread adoption but also increasing trust in the platform for high-value transactions. The **share of UPI in total digital transaction volume** rose sharply from **34% in 2019 to 83% in 2024**, signaling a major behavioral shift among users and businesses toward real-time, mobile-based payments.

In contrast, **IMPS** experienced gradual growth, with average monthly transaction value rising from ₹21,819 crore in 2019 to ₹70,709 crore in 2024. However, its pace of growth was relatively modest compared to UPI, and its role remained supplementary. Meanwhile, **traditional banking channels** like **NEFT, RTGS, and other modes** witnessed a sharp decline in usage. Their combined share of digital transaction volume fell from **66% in 2019 to just 17% in 2024**, suggesting a clear transition away from older systems that are slower and less convenient.

This data not only underscores UPI's success in making digital payments seamless and accessible but also reflects **changing consumer preferences**—favoring platforms that offer instant, 24/7 availability and mobile integration. Overall, the analysis shows that UPI has revolutionized the digital payment space in India, significantly outpacing older methods and setting a new benchmark for efficiency and scalability.

Graph: 2 Comparative Analysis of Digital Payment Modes in India (2019–2024)



Source: Compiled Data

This graph demonstrates a transformative shift in India's digital payments ecosystem, especially in favor of Unified Payments Interface (UPI). Beginning from modest figures in 2019, both the transaction volume and value of UPI have increased exponentially year-on-year. By 2024, the number of UPI transactions skyrocketed, emphasizing its growing acceptance across rural and urban India for peer-to-peer, merchant, and utility payments. The significant rise in UPI's share to 83% of total digital transaction volume suggests widespread adoption driven by factors such as ease of use, zero charges, interoperability, and mobile-first infrastructure.

Meanwhile, IMPS, though growing in value, showed comparatively slower growth in terms of market share. Its average monthly value reached ₹70,709 crore in 2024, indicating robust use in high-value or structured payments, but not at the scale of UPI's mass adoption. Additionally, the share of NEFT/RTGS and other traditional modes shrank to 17%, indicating a gradual decline in their usage for routine digital payments.

This shift underscores a larger trend: India is rapidly transitioning to a mobile-first, low-cost, and real-time payment economy. The chart clearly portrays UPI as the central driver of this transformation, potentially outpacing legacy systems not just in volume but also in future value and innovation potential.

10 FINDINGS OF THE STUDY:

- Exponential Growth in Transaction Volume:** UPI transaction volume increased from 1,078.8 crore in 2019 to 13,999.6 crore in 2024, reflecting massive user adoption across the country.
- Sharp Rise in Transaction Value:** UPI transaction value surged from ₹21.3 lakh crore in 2019 to ₹246.83 lakh crore in 2024, showing increased trust for both small and high-value payments.
- Dominance in Digital Payment Share:** UPI's share of digital transaction volume grew from 34% to 83%, overtaking traditional payment systems like NEFT, RTGS, and IMPS.
- Decline of Traditional Modes:** The volume share of NEFT, RTGS, and other modes dropped from 66% in 2019 to just 17% in 2024, indicating a major shift toward real-time payment systems.
- Consistent Growth in IMPS Usage:** IMPS values rose steadily, but its growth was significantly outpaced by UPI, positioning IMPS as a supplementary rather than primary mode of payment.

6. Wider Adoption Across Demographics: UPI adoption expanded beyond urban areas to semi-urban and rural regions, driven by mobile penetration and simplified interfaces.
7. Support from Government and RBI Initiatives: Regulatory support, zero MDR charges, and public campaigns significantly boosted UPI's accessibility and credibility among users.
8. Integration with Digital Services and Platforms: UPI became embedded in e-commerce, utilities, transportation, and merchant payments, further accelerating daily usage.
9. Year-on-Year Double-Digit Growth: Both transaction volume and value recorded double-digit growth rates annually, showcasing sustained momentum rather than a short-term trend.
10. Shift Toward a Cashless Economy: The growing reliance on UPI is a clear indicator of India's transition toward a less-cash, digital-first economy, reducing dependency on physical currency.

11 SUGGESTIONS OF THE STUDY:

1. The Rise of UPI: Transforming India's Digital Payment Landscape" Highlights UPI's role in reshaping the way payments are made across India.
2. A Study on the Growth and Adoption of UPI Payments in India A direct and academic approach, ideal for formal research.
3. UPI vs Traditional Digital Payments: A Comparative Study in India" Focuses on comparison with NEFT, RTGS, IMPS, and wallets.
4. "Unified Payments Interface (UPI): A Catalyst for India's Cashless Economy" Emphasizes UPI's contribution toward making India a digital economy.
5. "Tracking the UPI Boom: Usage Trends and Consumer Adoption (2019–2024)" Suitable if your data spans across recent years and includes usage trends.
6. Digital Disruption in Indian Finance: The UPI Revolution Highlights UPI as a disruptive innovation in the fintech sector.
7. Analyzing the Impact of UPI on India's Digital Financial Ecosystem Suitable for a more analytical or policy-based study.
8. UPI and Beyond: The Future of Instant Digital Payments in India Projects future scope while reflecting on past and current developments.
9. User Adoption of UPI in India: Patterns, Challenges, and Growth Drivers Focuses on consumer behavior and technological adoption.

12 CONCLUSIONS OF THE STUDY

The Unified Payments Interface (UPI) has fundamentally reshaped the digital financial landscape of India, becoming the most widely used payment system in the country within a short span of time. Between 2019 and 2024, UPI transaction volumes increased from 1,078.8 crore to 13,999.6 crore, while the total transaction value rose from ₹21.3 lakh crore to ₹246.83 lakh crore—a more than 10x increase in volume and 11.5x in value. This exponential growth underscores UPI's capacity to serve a rapidly digitizing population and meet the needs of both urban and rural users.

UPI's share of India's total digital transaction volume has steadily risen—from 34% in 2019 to 83% in 2024. In contrast, the combined share of NEFT, RTGS, and other traditional modes has declined from 66% to just 17%, indicating a clear shift in user preferences toward instant, mobile-friendly, low-cost solutions. The average monthly transaction value of IMPS, another popular real-time payment method, grew at a slower pace compared to UPI, further highlighting UPI's dominance.

Moreover, UPI has played a pivotal role in financial inclusion, especially by empowering small businesses, self-employed individuals, and first-time digital users in Tier 2 and Tier 3 cities. It has helped reduce the dependence on cash, streamlined government welfare transfers, and enabled access to micro-credit and insurance through fintech integrations.

From a policy and economic perspective, UPI's success illustrates how public digital infrastructure, when combined with innovation and regulatory flexibility, can produce scalable and inclusive financial solutions. With its continued growth, UPI is not just transforming India's economy—it's becoming a template for digital payments globally, with countries like Singapore, UAE, and France already partnering for cross-border UPI usage.

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