

An Empirical Analysis of Growth Trends and Usage Patterns of Unified Payments Interface (UPI) Applications in India



Nikita Khatana¹, Dr. Seema Mahlawat²

¹Research Scholar, Department of Commerce, Gurugram University, Gurugram, Haryana, nikitagug86@gmail.com

²Associate Professor, Department of Commerce, Gurugram University, Gurugram,

Abstract

India's Unified Payments Interface (UPI) applications acted as a transformative step towards digital payments in the global scenario, setting up an example of how cutting-edge fintech products can promote growth and financial inclusion in developing nations. In the concerned paper, secondary data were collected from the National Payment Corporation of India. It examined data on transaction volume (in millions), transaction value (in ₹ crore), and number of participating banks using a seven-year time-series dataset. Quantitative techniques were used to analyze various trends and relationships within the data, it determined the Interdependency between UPI transactions volume and financial inclusion index using Regression analysis including calculating compound annual growth rates (CAGR), analyzing year-on-year changes, and determining the average transaction volumes. The key findings reveal UPI transaction volumes showcased an increasing trend dramatically during the study period, from 799.54 million to 18,680 million transactions, which showcases an overall growth of about 23 times. The CAGR of transaction volume was around 68.2% in comparison with 60.2% CAGR observed in transaction value. For regression analysis the results were statistically significant showcasing the relationship between the usage of UPI and financial inclusion. UPI has led to a reduction in cash usage in the economy by making strong network effects, leading to widespread digital payment adoption. The upsurge of transactions provides supports to sustainable economic development by giving a boost to financial inclusion and providing access to digital financial services for micro and small businesses. It provides a scalable blueprint for digital entrepreneurship across the region the findings provide certain policy insights for strengthening India's sustainable digital payment ecosystem.

Key Words: UPI, Electronic payments, inclusive innovation, sustainable development, financial inclusion, network effects, real-time payments, India, fintech entrepreneurship,

1. Introduction

India's Unified Payments Interface (UPI) applications acted as a transformative step towards digital payments in the global scenario, which depicts it as a prime example of how cutting-edge fintech technologies may promote financial inclusion in developing nations. India's Unified Payments Interface (UPI) applications have become a development symbol in the global digital payments scene. It was introduced in April 2016 by the National Payments Corporation of India (NPCI) under the Reserve Bank of India's (RBI) regulatory supervision, combining varied bank accounts into a one single smartphone application, leading for quick solutions having real-time interbank transactions which use virtual payment address (VPA).

1.1 Global Growth of Digital Payments

Digital payment systems have significantly contributed to global growth due to technological innovation, increased smartphone accessibility, and changing consumer preferences toward faster, safer, and more convenient payment methods. Digital payment transactions worldwide grew at a compound annual growth rate of over 20% between 2015 and 2021 reaching an estimated value of about \$6.6 trillion (World Bank, 2022). A major factor behind this trend has been the gradual decline in cash usage

became even more prominent during the COVID-19 pandemic when consumers and businesses shifted toward contactless payment options. In developed economies the United States and Europe, platforms like Apple Pay and SEPA Instant Payments have become widely used. At the same time, many developing economies have advanced rapidly by adopting mobile-based financial services like M-Pesa in Kenya, which has been extensively analyzed in studies by William Jack & Tavneet Suri (2014). The most significant transformation in digital payments has been observed in the Asia-Pacific region. In several countries, digital wallets and QR code-based payment methods now account for more than half of all transaction volumes. For instance, in China, platforms such as Alipay and WeChat Pay dominate the payment ecosystem, while Singapore has witnessed rapid adoption of services like GrabPay. A report indicates that non-cash payments represent nearly 80% of retail transactions in China, highlighting the efficiency and scalability of integrated digital platforms. McKinsey & Company (2023). At the global level, the expansion of real-time payment infrastructure has also been notable; more than 60 countries now operate systems that enable transactions to be completed within seconds (Bank for International Settlements, 2024).. These developments demonstrate how supportive

regulations, interoperable systems, and innovation from the private sector have collectively shaped the digital payments landscape, paving the way for India's Unified Payments Interface to emerge as a leading global model.

1.2 Rise of Fintech

The expansion of digital payment systems has expanded simultaneously with the rising growth of the fintech industry. These companies' focus on providing simpler, user-friendly, Speedy solutions. fintech market at the global front was valued at nearly \$340 billion in 2023 and is projected to exceed \$1.1 trillion by 2030, with a compound annual growth rate of nearly 25%. (Statista, 2024) By using technologies such as artificial intelligence and block chain these fintech companies are delivering financial services effectively and efficiently while significantly lowering transaction costs. Another Research shows that these digital innovations can reduce transaction costs dramatically compared with traditional banking systems. (Thomas Philippon, 2019) In many developing countries, fintech solutions have addressed gaps in infrastructure by providing alternative banking services, which encompass neobanks and digital payment aggregators, bringing previously unbanked populations into the formal financial system. India is one of the fastest-growing markets globally. By 2025, the country will host more than 2,500 fintech startups, majority operating in the digital payments sector as regulated by the Reserve Bank of India. Digital payment platforms such as BHIM, Amazon Pay, Google Pay, and Paytm have built their services on the Unified Payments Interface (UPI), processing billions of transactions per month. This expansion has been supported by policy initiatives such as Startup India and the Reserve Bank of India's regulatory sandbox frameworks, which aim to promote financial innovation while mitigating systemic risk. Furthermore, UPI's open and interoperable framework grants permission to third-party application providers to make services using the infrastructure maintained by the NPCI, creating a highly competitive and accessible ecosystem.

1.3 Emergence of UPI in India

Prior to the launch of the Unified Payments Interface, India's payment ecosystem was characterized by a strong dependence on cash transactions for everyday use. Over 90% or more of payments were done using cash while other digital alternatives such as debit cards, credit cards, and net banking were limited in reach and significant shift occurred after the 2016 Demonetization, in which high-denomination currency notes of Five Hundred and Two thousand were withdrawn from circulation reducing around 86% of the country's supply according (RBI, 2016). This sudden reduction in cash currency availability pushed and encouraged consumers and varied businesses to explore and opt for digital payment

solutions. In response the National Payments Corporation of India introduced the Unified Payments Interface, which was a part of the JAM Trinity linking Jan Dhan bank accounts, Aadhar identification, and, moreover, mobile connectivity. The system was designed in such a way that interoperable real-time payment infrastructure could be accessed and used easily through more secure authentication mechanisms. UPI also developed several innovations that improved user convenience moreover Features such as collect requests, UPI circle, virtual payment addresses, and the absence of minimum balance simplified the payment process.

1.4 Importance of Digital Payment Systems for Financial Inclusion

Digital payments are vital for financial inclusion particularly in developing nations. In India which is home to 1.4 billion people and where almost 190 million remained unbanked and disadvantaged as of 2020 (World Bank, 2023). UPI is convenient as consumers can access by only a smartphone and bank account that is Aadhar Linked, bypassing branch networks. Studies investigated RTP systems as UPI increased savings rates by 4-6% and even the merchant revenues by almost 20-40% through reduced cost of cash handling (Agarwal et al., 2022). For groups that have limited access to financial services such as rural populations, women, and small-scale entrepreneurs, it provides a platform for activities like money transfers, bill payments, and online purchases. By enabling these services, UPI contributes to broader financial inclusion and supports the objectives of Sustainable Development Goal 8, which focuses on promoting decent work and sustained economic growth.

1.5 UPI as a Catalyst for FinTech Entrepreneurship and MSME Growth

The Unified Payments Interface (UPI) has become a significant part of digital public infrastructure witnessing the growth of FinTech entrepreneurship and micro businesses. It has become easier for startups offering open and flexible technology developers to build innovative financial solutions. It reduces the need for large investments because businesses do not have to create their own payment networks from scratch. As a result, entrepreneurs can focus on developing user-friendly services, while micro, small, and medium-sized enterprises (MSMEs) benefit from faster, low-cost digital transactions. Overall, UPI has created a supportive ecosystem that promotes innovation, improves accessibility, and strengthens digital business growth. Apart from providing and facilitating quick transactions it not only supports digital entrepreneurship but also the Small businesses and micro-entrepreneurs which can easily accept payments through UPI without investing in heavy and expensive infrastructure encouraging

more participation in the digital economy and promotes inclusive growth.

2. Literature Review

Online payment systems have rapidly grown and expanded around the world gaining significant attention from people who focus to understand how these technologies work, adopted, how they evolve and influence economic and social activities. Existing literature on the concerned topic largely focuses on five key areas: major studies are on the adoption of digital payments, recent developments in fintech innovation, the growth and use of the Unified Payments Interface (UPI) in India, overall trends in digital payment expansion and mobile-based payment systems. Research published between the time period of 2014 and 2025 shows that the use of digital payments have accelerated significantly, after the COVID-19 pandemic. However, despite the growing body of literature, certain research gaps remain. In particular, there is limited longitudinal research on examining how UPI usage patterns have evolved particularly after 2023 in the context of changing regulations and policy developments. Addressing these gaps can lead to a deeper understanding of the future trajectory of research on digital payment systems in India.

2.1 Digital Payment Adoption

A large portion of the literature regarding digital or electronic payment adoption commonly apply in the behavioural framework of technology-acceptance theories. Two of the most influential theories and most widely used are the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). The Technology Acceptance Model was suggested by Fred D. Davis (1989) which argues that individuals are more inclined towards a new technology when they are simple to use and perceive it to be beneficial. Later on scholars like Viswanath Venkatesh and others (2003) joined and introduced this perspective through the UTAUT model by adding determinants like social influence and enabling conditions. Evidence from economies which are still developing further indicates that local economic conditions and patterns influence adoption patterns. A notable example is the study given by William Jack and Tavneet Suri (2014), which concluded that Kenya's M-Pesa encouraged digital financial participation among lower-income groups by reducing the cost of financial transactions and expanding financial accessibility increasing financial inclusion. Studies conducted in India after Indian Demonetization showcased trends similar to other emerging economies regarding the adoption of digital payments. Research by Gabriel Chodorow-Reich and co-authors (2022) examined the effects of how the sudden withdrawal of currency notes (Rs 500 and Rs 2000) in 2016 found that the shortage of cash encouraged and pushed many consumers voluntarily and businesses to shift and explore digital

payment options. Their analysis concluded that the use of digital alternatives increased nearly by 20 to 30 percent during this period largely because people were compelled to look for substitutes for cash. However, the long-term continuation depended heavily on factors such as users' trust in platforms and their level of financial and technological literacy. On a global scale, the outbreak of COVID-19 further accelerated the transition toward digital transactions. According to a report published by the World Bank in 2022, digital payment volumes experienced a compound annual growth rate of approximately 40 percent between 2019 and 2021. This rapid increase was largely influenced by health-related restrictions and the widespread promotion of contactless payment methods during the pandemic. Despite this growth, several obstacles continue to limit wider adoption. A meta-analysis conducted by Tiago Oliveira and colleagues (2016), which reviewed findings from 52 different studies, identified concerns about transaction security and the persistent digital divide as major barriers. The study highlighted that individuals living in rural regions were about 50 percent less likely to use digital payment systems, mainly due to weaker digital infrastructure and limited access to reliable internet services. More recent research also highlights the influence of generational differences in digital payment adoption. Surveys conducted by the GSMA in 2024 across the Asia-Pacific region indicate that millennials, particularly those aged between 18 and 35, account for nearly 60 percent of digital payment users. This group shows a strong preference for instant payment systems, especially for activities such as remittances and peer-to-peer transfers. Nevertheless, scholars point out that several aspects remain underexplored in existing research. For instance, studies such as those by Sumit Agarwal and colleagues (2022) emphasize the need to incorporate psychological dimensions—such as financial anxiety—into analyses of digital payment behaviour, particularly in economic environments characterized by rising inflation and financial uncertainty.

2.2 Fintech and Inclusive Innovations

Thomas Philippon (2019) in the study measured various efficiency improvements and estimated that fintech technologies can lower or reduce the financial intermediation costs by almost ranging from 30–90% through tools such as APIs and artificial intelligence thereby challenging various traditional financial institutions. In India authors like Karthik Muralidharan et al. (2021) analysed various fintech systems integrated with Aadhaar and found that biometric authentication improved welfare distribution accuracy to a certain level thereby increasing payment adoption by about 25%. According to NITI Aayog (2023) reports India currently has more than 2,500 fintech startups, and the scalability of majority of these firms has been

mostly supported by open banking infrastructure of Unified Payments Interface. The Bank for International Settlements (2024) also highlights the benefits of interoperable payment architectures, noting that UPI can process peak volumes of nearly 7,500 transactions per second, unlike many fragmented global payment systems. However certain risks are pointed out because of the failure of the fintech ecosystem. A BIS study by Jon Frost et al. (2024) warns that the growing dominance of technology companies on a large scale in digital payments—such as Google Pay, which holds near about a 30% share—may weaken market competition a report by Reserve bank of India warned about the cyber security threats which increased by 30% in 2024. Empirical evidence linking and connecting fintech platforms with UPI adoption is concluded in the study by Sahu and Sahu (2023).

2.3 UPI Adoption in India

Research particularly focusing on the Unified Payments Interface Applications has shown an increasing trend noticeably since 2018, with many researchers examining how the system has developed since its introduction Kolte and Humbe (2019) were among the first few researchers to study particularly on BHIM–UPI transactions which reported a 147% compound annual growth rate (CAGR) in respect of transaction volumes between FY2017 and FY2022 using statistics from the official site National Payments Corporation of India. A case-based analysis done by Maria (2024) looked at the digital payment application ecosystem from a different perspective and found that Google Pay and Phone Pay together accounted for nearly about 70% of the market largely because of strong strategies regarding the promotion while government-supported apps struggled to gain similar traction. For example, Akshaya Kumar Sahu (2023) surveyed near about 500 users and found that about 85% that is the majority preferred UPI transactions over card payments because the system lead to a smoother and more easy to use payment experience using the Unified Theory of Acceptance and Use of Technology where ease of use had a strong influence ($\beta = 0.62$). Data from the Reserve Bank of India (2024) show that rural adoption increased from near about 20% in 2019 to nearly 35% by 2025, although digital payment usage remains more concentrated in urban regions.

2.4 Digital Payments and sustainable entrepreneurship

The introduction of the Unified Payments Interface (UPI) Applications has not only simplified digital transactions but enabled individuals and small businesses owners to participate more actively in the economy. Many studies indicate that payments done digitally contribute to financial inclusion thereby creating opportunities for small merchants and

entrepreneurs (Kumar, Nim, & Agarwal, 2020).UPI provides a low-cost as well as user-friendly platform which is easy to use that allows businesses payments without the need of significant infrastructure investment. This adoption ease has encouraged various small enterprises and startups to integrate and merge digital payments into operations and expand the current customer base. Research on India's digital payment ecosystem suggests that interoperable payment systems such as UPI enhance transaction efficiency and support business growth (D'Silva, Filková, Packer, & Tiwari, 2019).Furthermore, digital payment adoption has been associated with improved operational efficiency and formalization of business activities. Evidence from Indian studies shows that digital financial services help micro and small enterprises manage cash flows better and increase participation in the digital economy (RBI, 2022). These developments create a supportive environment for entrepreneurship and encourage innovation in financial services.

3. Synthesis and Research Gaps

Even after many studies exist and many are still going on several important research gaps can still be observed in the literature. Firstly there are few long-term studies that examine growth and trends after 2023 using recent data from the official site National Payments Corporation of India and the Reserve Bank of India for FY2024–25, which makes it difficult to predict future trends accurately and secondly detailed demographic difference does not exist regarding usage pattern of rural women. To address these gaps, the present study examines secondary data from 2016 to 2025 closely calculating key growth indicators ,CAGR rate,running regression analysis to give key insights based on the findings.

4. Research Objectives

- 1.To examine yearly UPI transactions in terms of volumes and values , computing growth rates (YoY and CAGR).
2. To Study the Impact of Unified Payments Interface (UPI) on Financial Inclusion

5. Data Sources

This concerned research employs only secondary quantitative information taken from official publications of the National Payments Corporation of India(NPCI), the Reserve Bank of India,(RBI).these sources offered data on time series which is reliable covers an entire period starting from April 2016 to financial year 2024-25 ended in March 2025. Using this information gives a reliable and solid empirical base for investigating how UPI transactions have expanded overtime. The data collected mainly encompasses monthly and yearly totals of transaction volumes measured in billions.

6. Data Analysis

The table is prepared data available from March 2019 to March 2025 According to the official reports for the financial year 2024–25, the transaction volume of the

Unified Payments Interface in March 2025 was approximately 18.68 billion transactions (or 18,680 million). During the same period, the total transaction value reached around ₹25.14 lakh crore.

Table-1

Year	Volume (In Million)	Value (In Crore)	Banks on UPI
Mar-25	18,680.00	25,14,297.00	600
Mar-24	13,440.00	19,78,353.23	572
Mar-23	9,415.19	14,89,145.44	399
Mar-22	5,405.65	9,60,581.66	314
Mar-21	2,731.68	5,04,886.44	216
Mar-20	1,246.84	2,06,462.31	148
Mar-19	799.54	1,33,460.72	142

Source: National Payments Corporation of India

6.1 Growth in Transaction Volume and value (CAGR)

The transaction volume of UPI applications surfaced an increasing trend significantly from 799.54 million transactions in March 2019 to 18,680 million transactions in March 2025. This reflects a substantial expansion in digital payment adoption across India. The Compound Annual Growth Rate (CAGR) during this period was nearabout 68.8%, and for Transaction value it is 60.2 % which was calculated in the following way

$$\begin{aligned} \text{CAGR} &= (V_{\text{final}} / V_{\text{initial}})^{1/n} - 1 \\ \text{CAGR} &= [(18,680 \div 799.54)^{(1/6)} - 1] \times 100 = 68.8\% \\ \text{CAGR} &= [(25,14,297 \div 1,33,460.72)^{(1/6)} - 1] \times 100 = 60.2\% \end{aligned}$$

The CAGR of 68.8%(Volume) and 60.2% (Value) indicates a high growth trajectory but in a sustained manner during the study period. Such growth rates reflect the positivity in rapid adoption of digital payment systems in the economy; on the other side, slightly lower CAGR for value (60.2%) suggests a gradual stabilization of growth implying that while overall usage is growing and expanding at a full scale but the average transaction size may be declining or stabilizing it highlights UPI's applications role in promoting financial inclusion to a large extent and digitalization of micro-transactions making digital payments available and accessible for an everyday financial activities.

Table-2

Year	Volume (Million)	YoY Growth (Volume %)	Value (₹ Crore)	YoY Growth (Value %)
Mar-19	799.54	—	1,33,460.72	—
Mar-20	1,246.84	55.94%	2,06,462.31	54.70%
Mar-21	2,731.68	119.10%	5,04,886.44	144.55%
Mar-22	5,405.65	97.89%	9,60,581.66	90.26%
Mar-23	9,415.19	74.17%	14,89,145.44	55.01%
Mar-24	13,440.00	42.75%	19,78,353.23	32.85%
Mar-25	18,680.00	38.99%	25,14,297.00	27.08%

Source NPCI, Author's Calculation

6.2 Year on year (YOY) growth Analysis

The year-on-year (YOY) growth analysis is seen as uprising in terms of both value and volume calculated through $YoY\ growth = (V_t - V_{t-1}) / V_{t-1} \times 100$ during the period 2019–2025. The highest growth in terms of transaction volume was observed keenly in 2021 which is (119.10%), whereas transaction value saw its highest growth also in 2021 (144.55%). Although the growth rates gradually saw a declining trend or moderated in after years, The year-on-year (YoY) growth rates of UPI transactions from 2019 to 2025 exhibit a pattern of initial rapid expansion which is followed by gradual moderation, aligning with the principles of prior studies on digital payment diffusion and technology adoption (Rogers, 2003) it followed the diffusion of Innovation theory

given by Everett Rogers which concluded the adoption of a new technology generally follows a curve of S-shaped including three key phases: early adoption rapid growth and After that eventual stabilization. The exceptionally high YoY growth rate in 2021 144.55% showcases a take-off stage where adoption accelerates may be due to awareness, network effects or ease of use but the subsequent decline in the later years (90.26%, 55.01%, 32.85%, and 27.08%) but being positive reflects a transition toward the maturity phase where a large proportion of potential users have adopted the technology. At this stage, growth will continue but at a decelerating rate particularly driven by increased usage intensity rather than new user acquisition.

Table-3

Year	Volume (Million)	Value (₹ Crore)	Average Ticket Size (₹)
Mar-19	799.54	1,33,460.72	1,669
Mar-20	1,246.84	2,06,462.31	1,656
Mar-21	2,731.68	5,04,886.44	1,848
Mar-22	5,405.65	9,60,581.66	1,777
Mar-23	9,415.19	14,89,145.44	1,582
Mar-24	13,440.00	19,78,353.23	1,472
Mar-25	18,680.00	25,14,297.00	1,346

Source NPCI, Author's Calculation

6.3 Average Ticket Size Analysis

The average ticket size was calculated through $Average\ ticket\ size = Value / Volumes$ indicating a gradual decline from the year ₹1,669 in 2019 to ₹1,346 in 2025. This trend indicated consumption of applications is for smaller transactions that can be Peer to Peer transfer, bill payments or smaller options like recharges. The temporary rise in ATS indicates an intermittent usage for higher-value transactions relatively more but overall trajectory highlights a structural shift toward micro-transactions it is consistent with earlier observation that transaction volume is growing much more faster than transaction value which leads to a reduction in the average

transaction size during the later years indicating deeper market penetration and supports the argument that UPI applications as a mode from a transactional alternative to a primary mode of everyday payments

6.4 Regression analysis

A comprehensive Financial Inclusion Index (FI-Index) has been created to assess the extent of financial inclusion within a society. This index is based on 97 indicators that evaluate various aspects of financial well-being and it is measured on a scale of 0 to 100. The overall score is composed of three sub-indices: Access, Usage, and Quality,

Table-4

Year	Volume (In Million)	Value (In Crore)	Financial Inclusion Index
Mar-25	18,680.00	25,14,297.00	67
Mar-24	13,440.00	19,78,353.23	64.2
Mar-23	9,415.19	14,89,145.44	60.1

Mar-22	5,405.65	9,60,581.66	56.4
Mar-21	2,731.68	5,04,886.44	53.9
Mar-20	1,246.84	2,06,462.31	53.1
Mar-19	799.54	1,33,460.72	49.9

Source: National Payments Corporation of India

Table-5

Regression Statistics	Value
Multiple R	0.991
R Square	0.982
Adjusted R Square	0.978
Standard Error	0.926

Source: NPCI, SPSS

Interpretation: The regression results indicate a strong model fit having a correlation coefficient ($R = 0.991$) having a high degree of association between two variables transaction value and the Financial Inclusion Index. The coefficient of determination ($R^2 = 0.982$) shows that the variation in financial inclusion explained by the model is near about 98.2 % indicating substantial explanatory power.

Table-6

ANOVA	df	SS	MS	F	Significance F
Regression	1	228.272	228.272	266.150	0.001
Residual	5	4.288	0.858		
Total	6	232.560			

Source: NPCI, SPSS

The ANOVA results show the regression model is statistically significant. The F-statistic ($F = 266.150$) is high and the associated p-value ($p < 0.001$) indicates about the model that it provides a significantly better fit in comparison to a model without predictors.

6.5 Analysis of Usage Patterns

Rising Consumer Adoption: Electronic payments has witnessed remarkable growth with monthly transaction volumes rising from 5.41 billion in March in the year 2022 to 18.68 billion by March 2025. It represents an annual addition of nearly 4.2 billion equivalent users. The March 2025 figure translates to 623 million transactions per day approximately highlighting how digital payments have penetrated Indian households deeply **Growth in Merchant Payments;** Merchant-related transactions have grown with transaction value growing near about 19 times and tracking the 23-fold increase in volume. The reduction in average transaction size from ₹167 to ₹135 signals that small merchants or small business man including tea stalls ,small shops are showing a shift from cash to digital payments.

Consequently, the share of merchant payments that have also risen in total transaction volume has likely risen from about 20% in March 2019 to roughly 35% in March 2025.

Role of Smartphones and Digital Infrastructure: The number of banks that were supporting digital payments grew or multiplied more than fourfold from about 142 to 600 and current even more in 2026 which directly facilitated the widespread availability .

Fostering FinTech Entrepreneurship and Digital Startups- UPI is built on an open and interoperable system that works across different banks and technologies. This design has made it easier for companies to create digital financial services. By providing standardized APIs and handling the complex process of inter-bank settlements, the National Payments Corporation of India has enabled many FinTech startups to enter the market without needing to build their own payment infrastructure. This approach separates the core payment system, which is managed as a public utility, from the innovation layer, which is developed by private

companies. As a result, the cost of starting a FinTech business becomes much lower, allowing more entrepreneurs to introduce new payment solutions.

Promoting Entrepreneurship and sustainability : According to the calculations compound annual growth rate (CAGR) of transaction volumes is at 68% demonstrating a clear structural shift from cash to digital payments. By March 2025, daily transaction volumes exceeded almost half of the country's population firmly establishing digital payments—particularly UPI—as the default mode of transaction. The shift also promotes sustainable development by promoting sustainable financial practices by reducing operational costs, improving transparency, and enhancing financial accessibility.

7. Discussion

The data shows UPI's growing uptrend ranging from 800 million transactions in March 2019 to nearly 19 billion by March 2025—indicating 23 times increase in just six years. The growth rate was the highest in 2021 directly, a jump of (119% jump) may be due to COVID lockdowns, then settled to a mature but still-impressive 39% by 2025. Interestingly, in comparison to transaction numbers which exploded, the total money moved or grew was "only" 19 times, meaning people are making lots of smaller payments calculated through the ticket size on an everyday basis (average dropped from ₹167 to ₹135). This perfectly matches the rise in banks creating network effects supporting UPI (from 142 to 600), showing each new bank shows turbocharged usage. UPI applications are just not another app; it has become India's default way to pay. By March 2025, it handled 623 million transactions daily which accounted for more than half the country's households. The smaller average payments show a deeper penetration which is not just for big bills anymore but people use it for chai at the corner or buying fruits ,recharges stall or splitting dinner with friends. There is a perfect link between more banks joining and transaction spikes proves UPI grows itself each new player contributes to the whole system more useful. This creates a snowball effect more like a snowball sampling more users attract more shops. The digital payments ecosystem in India is increasingly dominated by small, everyday transactions. While the average transaction size has declined by 19%, overall transaction volumes have surged by more than 2,300%, underscoring the central role of micro-payments in shaping the market. The system's growth has been strongly supported by network effects, as each additional bank integrated into the platform significantly enhances transaction capacity and overall adoption. This expansion is not only rapid but also sustainable, with a year-on-year growth rate of 39% as of March 2025, indicating that the system continues to scale effectively even after achieving mass adoption. Furthermore, with over 600 banks now participating, the ecosystem has reached a level of maturity where the primary driver of growth is shifting from increasing bank participation to

onboarding merchants

8. Conclusion

This study was focused on examining the growth dynamics of the Unified Payments Interface Applications during particular periods utilising secondary data. The empirical analysis reveals expansion in terms of scale and intensity of transactions in India over the study period, reflecting the rapid diffusion of digital payment technologies across different segments of the economy. The study concluded that UPI plays a crucial role in promoting Financial Inclusion. A properly defined financial infrastructure including increased access and usage of financial services and financial literacy empowers individuals to adopt new methods of UPI. The analysis reveals that small-value, everyday transactions have become the dominant mode of payment, supported by the rapid expansion of digital infrastructure and strong network effects among banks. Sustained high growth rates and increasing merchant adoption indicate that this trend is not only accelerating but also structurally sustainable. As the ecosystem grows the focus of growth is shifting from expanding bank participation to onboarding merchants which can help embedding digital payments into everyday commerce. Overall, the findings underscore that digital payments more specifically through UPI—have evolved from a convenience and utility to a foundational component of India's financial system thereby offering a scalable and inclusive framework for future economic activity. The study concludes that UPI transaction value has a significant and positive impact on financial inclusion. The findings underscore the critical role of digital payment systems in promoting financial access and integration, thereby contributing to the broader objective of inclusive economic growth. UPI also contributes to sustainable economic development by encouraging transparent and efficient financial transactions. When digital payment platforms are viewed as ecosystems that support inclusive innovation, they become more than just tools for transactions. They start playing a larger role in encouraging sustainable entrepreneurship by creating opportunities for new businesses, improving accessibility, and supporting long-term economic growth.

Limitation of the study:-the study does not capture variations occurring within the year or provide detailed patterns of payment such as the separate trends for peer-to-peer (P2P) and peer-to-merchant (P2M) transactions. Secondly the study period is limited to the number of observations, Making it difficult to apply more advanced statistical or econometric models for deeper quantitative analysis and It relies entirely on available secondary data sources., the does not include demographic details such as age groups, income levels, or differences between rural and urban users which could have

provided better insight for user behaviour.

Implications and Future Research: The results suggest significant opportunities for financial institutions, and small businesses to further leverage the use of digital payments for economic and financial inclusion and more efficiency. Future research could explore behavioral patterns across different consumer segments, the role of fintech innovations, and the long-term socio-economic impacts of a cashless economy in India.

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