

A Study of India's Payment Systems

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Abstract—India's financial infrastructure is predominantly formed by the payment system; it acts as the backbone facilitating and connecting by performing crucial functions of monetary exchanges and transfers between the components of Indian financial system. The study examines the growth path of payment network in India over the past three years to comprehend the diverse payment network options adopted by consumers in India. Secondary data sourced from Reserve bank of India enclosing the statistics of transaction volumes and values and adoption of payment modes is used. The analysis reveals an exponential growth in digital payment with UPI emerging as the most popular payment system.

Index Terms—Payment Network, Payment gateway, UPI, Visa, RuPay.

I. INTRODUCTION

Payment system is the infrastructure that allows movement of money between parties. The configuration of payment system includes institutions like banks and other financial organizations, instruments like cash, cheques, cards- debit & credit, digital wallets etc, payment networks facilitate funds transfer, movement of funds between financial institutions through cheques, RTGS, NEFT & IMPS. it is enabled through clearing houses, payment network for cards both debit and card are popularly arranged by Visa, Maestro, RuPay etc, payment gateway is used for online payments popularly through PayPal, RazorPay, BillDesk, CC Avenue etc.

The payment mechanism has experienced various routes over the years, the history of payment system began with barter system, a method used for exchanging goods and services progressing to commodity money, a system using items having inherent value such as precious metals like gold, silver or grains as an exchange medium followed by coinage system where in metal or plastic circular coins were minted, regulated by the government during the

period of 700B.C for making standard currency unit with different denominations for convenient payment and unique design for identification. This around 17th century was followed by cash, currency notes, cheques etc and the later years have witnessed numerous evolutions of the payment system with debit card, credit cards becoming the plastic money accessible 24*7 through ATMs and POS cashless transactions, electronic clearing system introduced in 1990's succeeded by the 2000s digital age of internet banking, mobile banking, and the latest digital UPI payment system. All through these advancement and upsurge, payment networks that mediate through the financial institution and the merchant have played a significant and crucial role.

Payment network is an intermediary between consumers, financial institutions and merchants connecting safe and effective transactions.

II. FUNCTIONS

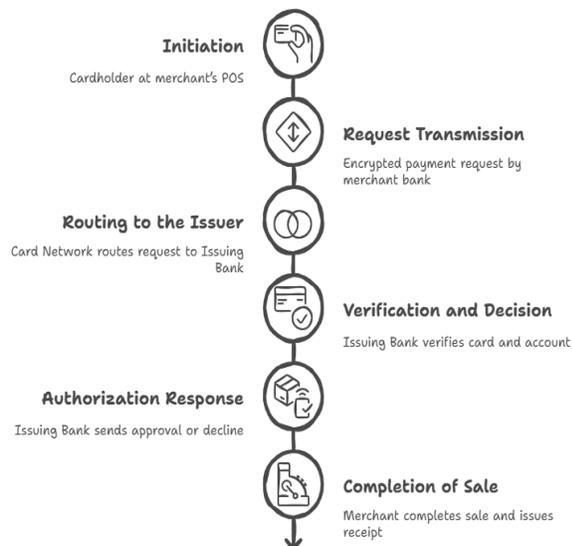
The payment network is the infrastructure that facilitates the movement of funds in the economic ecosystem. It is the link between various stakeholders of financial environment; the functions of payment network showcase the directions of the trail through which the transactions take place.

- The trail of a financial transaction is commenced with initiation of data entered by the customer while swiping a card, tap a device, scanning a QR or writing a cheque, this process is called as initiation of the transaction by the customer followed by transmitting the customer's details and the transaction details from the collector's terminal to the customers issuing bank, which is followed by the issuing bank corresponding the data with customers account, availability of funds and the legitimacy of the transaction and on verification approves or

rejects the transaction. The processing time for the above activities is mere seconds.

- The next step after the communication of approval or denial is validation of the transaction, this involves the exchange of fees between the collector’s network and issuers network. This step is called as clearance.
- Validation and clearance are followed by settlement of funds which is the final leg of the process, this process timeline depends on the method of payment for credit cards it is done in batches, for cheques it takes three business days.

The following is the procedure payment networks work.



Source: Primary

III. OBJECTIVES

1. To assess the growth of payment network in the recent times in India.
2. To compare and identify the most popular payment network in India.

IV. NEED OF THE STUDY

Indian financial market provides various choices for payment methods however, with the government backed initiatives for digitalization and accessibility of digital devices, India has risen to be the trailblazer in digital payments. The need of the study is assessing the commonly used payment network and its growth in India.

V. RESEARCH GAP

The data represented is related to pan India, however, regardless of the volumes being high and the digital platforms being inclusive of rural India, it does not represent their active participation, financial health, and technical ease. There is a need to assess the long-term viability of the digital payment gateways, develop and sustain the rural inconsistent network infrastructure.

VI. RESEARCH METHODOLOGY

The Indian economy has gone through a major shift from heavy reliance on physical cash for financial operations to a worldwide ground breaker for digital transactions. This transformation is an outcome of the structural overhaul driven by the regulators in changing the customer habit. The study is to determine the assess the popular payment network and its growth in India.

VII. DATA COLLECTION& ANALYSIS

The data for the study has been collected from secondary sources, the report published by RBI though RBIB Table No. 43 - Payment System Indicators has been the basis of data on which the study has been conducted. The period of the data is taken from the year 2022 to August, 2025. The data aided in understanding the growth of payment network in India and to determine the most frequently used payment gateway. Existing research work in the area is examined to comprehend and is the source review of literature. Data has been sorted and analysed using Microsoft excel.

VIII. REVIEW OF LITERATURE

Jayaseelan Shanmugam (2025)

The study explores the transition from batch processing to real time reconciliation and the benefits of immediate authentication and authorization of transactions eliminating the time lag and reducing the possibility of fraud. The objectives of the is to determine the drawbacks of transaction scheduling, threats, and the methodology along with the benefits of real time system. The study collects the data globally from various payment gateways, merchants

and retail banks to infer the reduction of errors, operational enhancement and comparison between batch and real time processing. It finds real time system removing the transaction processing gap and is efficient and transparent.

Anan Jin (2024)

The study investigates the competence and ability of payment channel networks (PCNs), the objective of the study is to throw light on deposit reduction prevalent in the operating payment network and to come up with a proposition of secure and self-reliant payment channels and showcase the strength of Pay Switch- a smart payment channel network. It looks into the blockchain resolutions to reduce the current payment channels stoppages and queues. The data for the study is collected through the ripple network – a digital payment network from the year 2013 to 2016 with a review of 3,31,096 payment channels. The study has used multiple technical tools like Graph Theoretic Network Analyzer (GTNA), Baseline Routing Algorithms etc. Through this study it has found better performance with Pay Switch integration, cost efficiency, and enhanced success rates.

Lulu Wang (2024)

The study investigates the welfare effects of regulation and competition in the payment system. It probes into the payment market of credit cards and debit cards, its operation in the United States market, the objectives of the study are to study the regulation of payment markets affecting the prices and welfare, it probes into the merchant fees, rewards, and the competition in the payment network. The study concludes payment market to be dynamic and highly competitive however the hidden charges need to be regulated.

Lulu Wang (2022)

The study is relating to the functioning of the three major card payment networks that dominate the market and the model of consumer rewards and merchant fees being levied passing on the burden on the retail prices and effecting consumer welfare. The study exhibits the functioning of the payment work system and the statistics of the consumer. It has collected the data trade journals, Nilson report and consumer data from Nielsen Home scan panel and the Federal reserve diaries and Survey of consumer payment choice. Analytical tools like conditional

probabilities, logistics regression is used the study comes up with a two-sided model, simulating the network market on basis of consumer adoption, merchant pricing and acceptance.

Nikolaos Papadis (2020)

The study is a review of payment channels based on blockchain; it investigates the range of payment system and financial hurdles of blockchain based payment channels. The objective of the study explores the system and functioning of payment channels network. The study probes into the prevailing challenges and possible solutions. The study has collected the challenges related to payment system through the existing literature. The study finds the payment channel networks with blockchain is a favourable mechanism.

Robert M. Hunt (2003)

The study investigates the economic movement of card payment gateways and the coordination process involving various financial institutions. The objectives of the study are to review the dynamics of the card payment practices, its policies, rules, and fees. The data for the study has been collected primarily from United States however it also studies the regulatory framework of Australia and European countries through existing economic reviews, reports from bank of international settlements, Nilson report and retail payment system surveys. It finds adoption of network externalities; fees used as shift of costs and the practices of merchants in levying surcharge. The study concludes a balance and coordination through interchange fees and regulations.

James Chapman (2010)

The study is a review of the existing research conducted on the application of payment network in Canada. The study analyses Canada's larger value transfer which is the wholesale payment system and a vital financial infrastructure. The objectives of the study is to comprehend the provide a perspective on the intricate connections and the importance of individual participants in the payment system and to evaluate the risks and unstableness in the payment system. The study provides a renewed framework relating to network centrality and clustering in the individual participants importance in LVTS.

Paul Van den Bergh (1994)

The study discusses the part of interbank transfers and an evolving payment system’s operational and financial framework; it elucidates the potential of payment system in execution of tasks by transmitting ownership titles of generally recognized fiat money on commercial or central banks. The research summaries the structure of funds transfer through various means of channels and instruments by commercial banks,

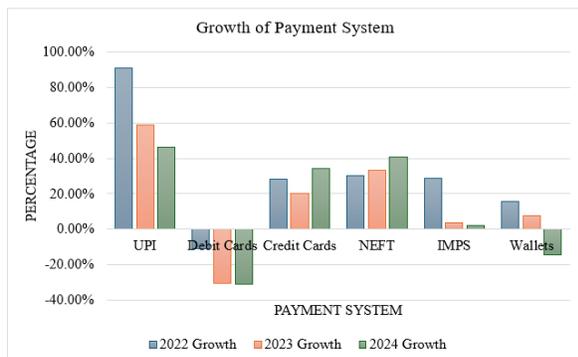
clearing houses and the central bank. The objective of the study is to describe the mechanism of modern payment system and to describe the gross and net settlement of interbank payment system. The study finds the movement from gross settlement to net settlement system, a process which can reduce the count of remittances and reduces the liquidity in the financial framework.

IX. RESEARCH ANALYSIS

Table 1

Year	UPI	Debit Cards	Credit Cards	NEFT	IMPS	Wallets
2022	7,40,396.90	36,446.00	27,674.00	49,480.30	55,869.90	58,290.20
Growth	91.15%	-10.82%	28.33%	30.18%	28.79%	15.84%
2023	11,76,087.50	25,255.60	33,319.80	65,871.40	58,006.50	62,774.60
Growth	58.85%	-30.70%	20.40%	33.13%	3.82%	7.69%
2024	17,22,080.20	17,380.10	44,720.30	92,684.30	59,383.40	53,579.70
Growth	46.42%	-31.18%	34.22%	40.71%	2.37%	-14.65%
2025*	14,58,458.50	9,150.80	36,424.80	65,837.10	36,311.60	42,435.20

Source: RBI - RBIB Table No. 43 - Payment System Indicators



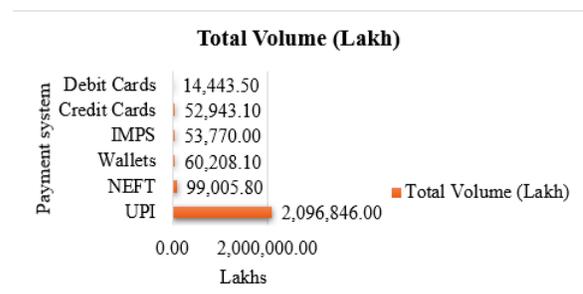
The above data represents the major payment systems used by the consumers over the past 3 years beginning from the year 2022 to August 2025 (8 months data). It showcases the yearly transactions volume and growth percentage, the data clearly showcases the dominance of UPI over the years with doubling the volume from the year 2022 to the year 2024, it displays a decline in debit card volumes indicating shift towards UPI for retail transactions, credit cards shows a strong increase of 34.22 % in the year 2024, NEFT shows a high value growth however IMPS has only 2.4% growth in 2024, though Wallets had shown a growth during the year

2022 and 2023 there seems to be a significant decline in 2024

Table 2

Payment System	Total Volume (Lakhs)
UPI	20,96,846.00
NEFT	99,005.80
Wallets	60,208.10
IMPS	53,770.00
Credit Cards	52,943.10
Debit Cards	14,443.50

Source: RBI - RBIB Table No. 43 - Payment System Indicators



The above table represents data used to identify the most popular payment system, the transaction volumes have been aggregated over the period of 12 months beginning from September 2024 – August 2025, to help comprehend the payment system mostly used by the consumers. The study has considered the volume of the transaction i.e., how many times the system is used rather than the value i.e., the amount, to represent the number of times consumers has used the system and to conclude frequently used and popular payment network. From the data gathered UPI represents majority retail payment volumes exceedingly significant from other systems.

X. CONCLUSION

The data represents a profound transformation in India's payment system characterized by Digital dominance, over the past three-year UPI has a robust rise as India's primary driver, achieving a dominant scale with 204% volume increase, debit cards has witnessed a massive decline indicating a replacement of physical instruments over digital transactions. These trends indicate a rapid shift from physical instruments and paper-based systems to adoption of digital ecosystem.

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