

INDUSTRIAL ENGINEERING JOURNAL

ISSN 0970-2555

Volume : 52, Issue 10, No. 4, October : 2023



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DIGITAL PAYMENT SYSTEM: PROMOTING CASHLESS ECONOMY

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Abstract

The rapid advancement of digital payment system has transformed the financial landscape globally, India being no exception. Government of India started the digital India campaign on 1st July 2015 with a motive to transform India into digitally empowered society and knowledge economy and in order to support cashless transaction government have initiated various modes of digital payment system. Before demonetization digital payment accounted for only about 10% of all transactions in India but this sector has undergone remarkable growth in recent years. As India continues its digital transformation journey this research paper aimed to study the trends associated with various modes of digital payment in India. It also aims to identify most popular digital payment mode used and its driving factors.

Keywords: Digital India, digital payment, cashless transaction, modes of digital payment

Introduction

India's Digital payment market is expected to be US \$10 trillion by 2026 [1]. Payments done through digital or online mode without using hard cash is known as digital payment. Digital payments to take place both payer and payee both must have a bank account, device for making payment and a medium of transmission but need for bank account may not be necessary in future with launch of e-rupee by Reserve Bank of India. Government of India in order to make India a cashless economy and digitally empowered society and achieve objective of Digital India which is to achieve "Faceless, Paperless, Cashless" status. Government have given Digital payment promotion great importance and key enabler of India towards cashless economy is JAM Trinity i.e., Jan Dhan Yojana, Aadhar and Mobile. Aadhar was first launched on 29th September 2010 which helped in verifying individuals and beneficiaries and PMJDY launched on August 2014 helped in financial inclusion by opening bank accounts for rural people and unbanked household. Mobile phone penetration is another trinity in its success as India till 2021 had 750 million smartphone users according to Deloitte data which is expected to reach 1 billion by 2026. These growth in smartphone users have made it easier and convenient to use digital payment modes. For making digital payment various modes of digital payment can be used like banking cards, Unstructured supplementary service data (USSD), Aadhar enabled payment system (AEPS), Unified payment interface (UPI), Point of sale (POS), Immediate payment service (IMPS), Real time gross settlement (RTGS) it has replaced the traditional method of making payment. Contactless payment became popular in tier-2 cities due to serious risk through cash payment during pandemic. Debit card and credit card usage increased after demonetization [2]. Adoption digital payment can make the economy competitive as payment and settlement system can play an important role in economic development of the country.

1.1 Modes of Digital Payment

Unified Payment Interface (UPI)

It is a system through which multiple bank accounts can be operated in a single mobile application. To use UPI a proper internet connection is required along with registered number with active bank account and a smartphone. It was launched on 2016 for the public. The growth in UPI payments may be due to no transaction cost charged using UPI, government policies, easy to use features, merchant acceptability etc. This scenario can change from 1st April 2023 due to change in rule. UPI transaction of more than ₹ 2000 through Prepaid Payment Instruments (PPI) like PhonePe, Google pay, Paytm wallets will be charged to the merchants as an interchange fee is to be paid to PPI service providers. Although bank to bank transaction does not carry any charge till now. The customers are not charged



directly but merchant might charge some extra charge to the customers as they have to ultimately pay the PPI service providers.

Real Time Gross Settlement (RTGS)

Minimum amount to be transferred through RTGS is 2lakh and there is no upper limit for transaction done through branches but if using internet banking amount which can be transferred per day per customer is 50 lakhs. In India RTGS system was launched by Reserve Bank of India in the year 2004. In this system transaction are processed in real time i.e., instructions are processed when received in real time.

National Electronic Fund Transfer (NEFT)

It is not only a fund transfer mode but is also used for variety of other transactions like payment of credit card dues to card issuing company, payment of loan EMI, inward foreign exchange remittance etc. It was launched on November 2005. In this method money is not transferred instantly like RTGS instead transferred in batches in 48 hourly time slots. A fee is to be paid on all NEFT transactions where amount varies from ₹2.5 to ₹25 depending on amount transferred.

Immediate Payment Service (IMPS)

The maximum IMPS limit is ₹ 5 lakh while minimum is ₹ 1. Each time a sum of ₹ 2lakh can be transferred and this service is available 24x7. IMPS was launched on November 2010 as for banks it was quite challenging to meet demands through RTGS and NEFT. For making IMPS transfer customer need a MMID number for Person-to-person transfer (P2P) while for making person to account transfer (P2A) IFSC code and account number of the beneficiary is required. To participate in IMPS banks, need to have a valid prepaid banking payment instrument license from RBI.

Cards- Debit cards & Credit cards

A card consists of 16-digit number, expiration dates, magnetic strips and EMV chips, card verification value and is made of plastic. In India ATM was introduced in the year 1987 and it took time for people to understand and use the new technology. Debit card is used for withdrawal of money from customers bank account whereas credit card allows to borrow money from card issuer to purchase items up to a certain limit.

Unstructured Supplementary Service Data (USSD)

An internet facility is not required for using USSD based mobile banking. *99# service can be used by dialling it in their mobile phone for interbank account fund transfer, balance enquiry etc. This mode of digital payment can also be used in feature mobile. It was launched on November 2012 mainly to provide banking service to all the people across the country.

Aadhar Enabled Payment System (AEPS)

The AEPS enables customers to deposit and withdraw cash, Aadhar to Aadhar fund transfer. It is a bank led model which allows online financial transactions at Point-of-sale and Micro ATM through business correspondent of any bank. It was launched to serve government of India and RBI in meeting financial inclusion initiatives.

Review of Literature

Joshi [3] studied trend in digital payment through various modes from 2014-15 to July 2017 and also compared new modes of digital payment with older ones. During the study period it was found that digital payment through NACH and IMPS was growing as compared to other modes. Also, percentage of retail payment in volume has more growth than their values as compound annual growth rate (CAGR) of digital payment volume is 45 percent while CAGR of value is 12 percent. Das et al. [4] studied impact of demonetization from 2015-2017 of POS and ATM usage, mobile payments through BHIM and UPI and policy measures taken for promoting digital payment. As India is blessed with a young demographic profile and with mobile penetration after demonetization on 8th November 2016 after taking away 87 percent of cash there is growth in use of digital payment modes as alternate solution.



Kumar & Menon [5] studied about relationship between UPI and customer satisfaction, analysed customer perception towards various aspects of UPI and identified major problems faced by customers regarding UPI service access. The study found that there is a positive attitude of customer towards unified payment interface services and has a positive relationship between education and usage of UPI services which is also a major challenge faced by customers.

Upadhye et al. [6] assessed the key parameters and model historical data to design regression model for prediction of monthly value of transactions (dependent variable) dealt on UPI using monthly volume and banks live on platform, which are explanatory variable and inferred from regression coefficient (β) value that there exists significant relationship between volume and value of transactions on UPI. Also, researcher inferred that zero MDR policy have been counterproductive denoted by fall in volume of debit cards payments after examining 4 leading banks in India based on their combined remittance and beneficiary volume through UPI platforms.

Kumar & Singh [7] studied about various kinds of digital payment transactions and evaluated digital payment activities and concluded that PPI transactions have increased starting from March 2016 while it also claimed that value of digital payment dropped from 149 lakh crore to 107 lakh crore in study period. Debit card and PPI account accounted majority of non-cash transactions.

Kumar et al. [8] studied about growth trajectory of UPI-based mobile payments in India. UPI transaction volume through different platforms for financial year 2020-21 was highest from google pay followed by PhonePe. NPCI International Payments Limited (NIPL), collaboration with Singapore-based Liquid Group, a leading cross-border digital payments will help in reaching 2 million merchants internationally. It also stated that UPI has now crossed the early adopters' stage and entered into the early majority stage. India is witnessing high growth in digital payment as Indian consumer has a median age of 28.4 as on 2020. It also stated about credit facility through UPI which can be the next big thing.

Sheerin [9] studied and analysed the growth of digitalisation of banking sector, focusing on the number of ATMs and POS deployed, the value and volume of transactions done through NEFT, RTGS and mobile banking, various schemes adopted by Government and challenges of the digital payment system. Till march 2018 ATM deployed was 2,07,052 and POS deployed was 30,83,067. UPI and IMPS mode of digital payments registered a robust growth in 2017-2018 both in terms of value and volume.

Sahi [10] studied on trend of security and privacy in digital payment using systematic review combining qualitative and quantitative methodologies. Systematic review of 591 articles from Scopus database showed that China is the topmost country publishing articles on digital payment followed by India and USA. The trend of studies on security and privacy concerns related to digital payment from 1989 to 2021 shows that highest research on this topic was done on 2021 i.e., 128. Future research on various dimensions of risk like platform related risk, network related risk, service-related risk etc can be studied.

Research Gap

Although various studies have been done on digital payment by comparing old mode of digital payment to newer ones, impact of demonetization on digital payment in 2015-17 time period, security and privacy in digital payment, impact of Covid-19, digitalisation of banking sector and most of digital payment research was based on Unified payment interface growth, government schemes and challenges of digital payment. Studies have also been done on studying trend till 2018-19 but very few studies have been done studying trend of digital payment from 2018-19 to 2022-23. Most popular digital payment mode used and driving factors of digital payment. Thus, the researcher has selected the present study which will provide insight into adoption of digital payment modes focusing on their volume and usage.

**Objectives of the study**

1. To study the trends in digital payment modes in India from 2018-19 to 2022-23 (till Jan)
2. To identify the most popular digital payment mode used in India from 2018-19 to 2022-2023.

Research Methodology

The study is based on secondary data and have used descriptive statistics for data analysis. Secondary data is collected from Open Government data platform to source the volume and values of different digital payment modes. Digital Payments modes volume and value from 2018 to 2023 (till Jan) is used for the study. To support the findings and conclusion and to find the driving factors for adoption of digital payment various research papers, newspaper and magazine articles, company reports is used for the study. Data have been analysed using Excel and Python (using google colab tool) with percentage table, bar graph and line chart.

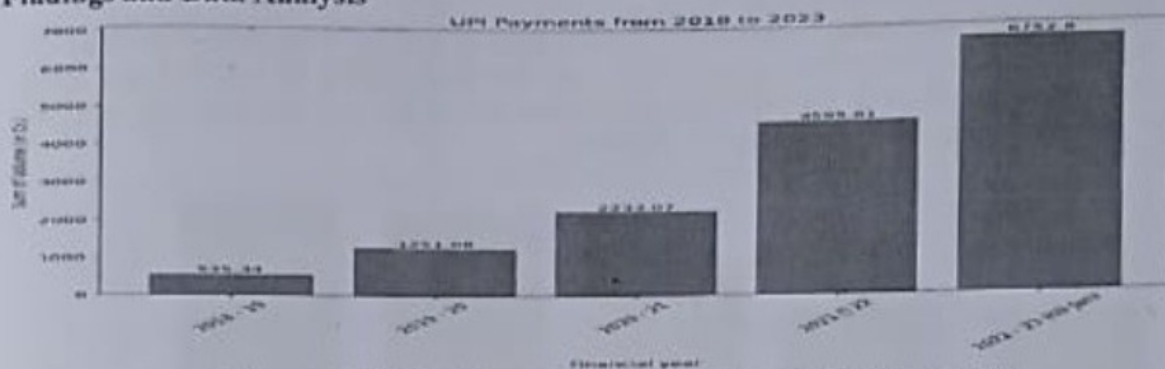
Findings and Data Analysis

Figure 1.1 Unified Payment Interface volume from 2018 to 2023

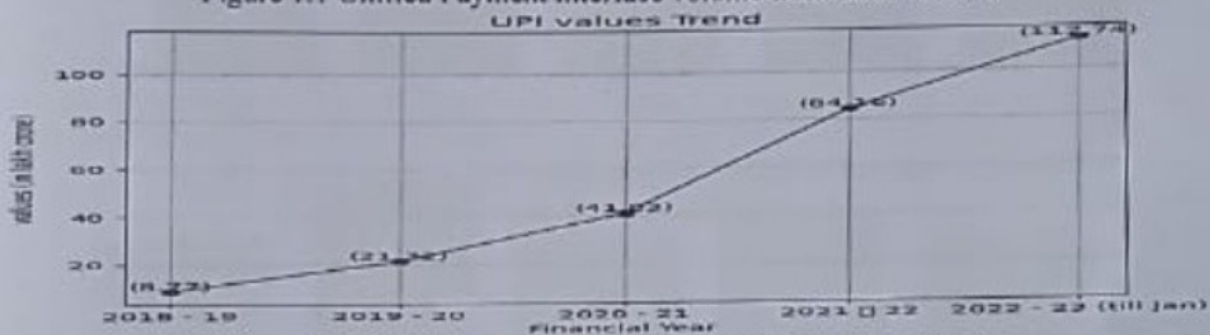


Figure 1.2 Unified Payment Interface values from 2018 to 2023

Source: data.gov.in

From figure 1.1 it can be stated that UPI payments have increased from 2018 which was 535.34 crore to 6752.8 crore in 2023 (till Jan) which shows a tremendous increase in volume in the past five years and if we see the figure 1.2 UPI values trend graph it can be interpreted that amount of transaction through UPI have also increased tremendously from 8.77 lakh crore to 112.74 lakh crore.

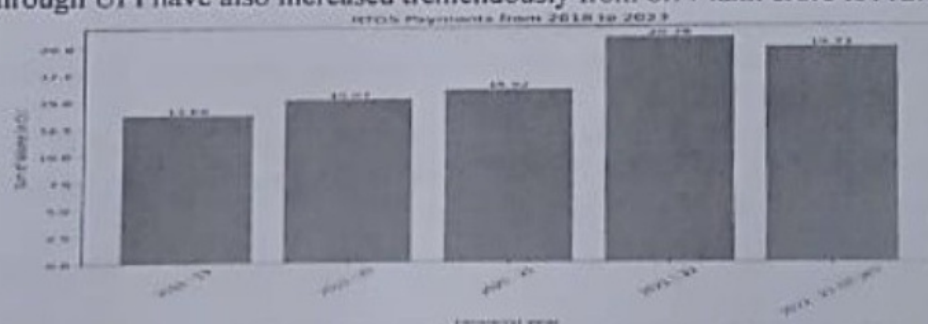


Figure 2.1 Real Time Gross Settlement volume from 2018 to 2023

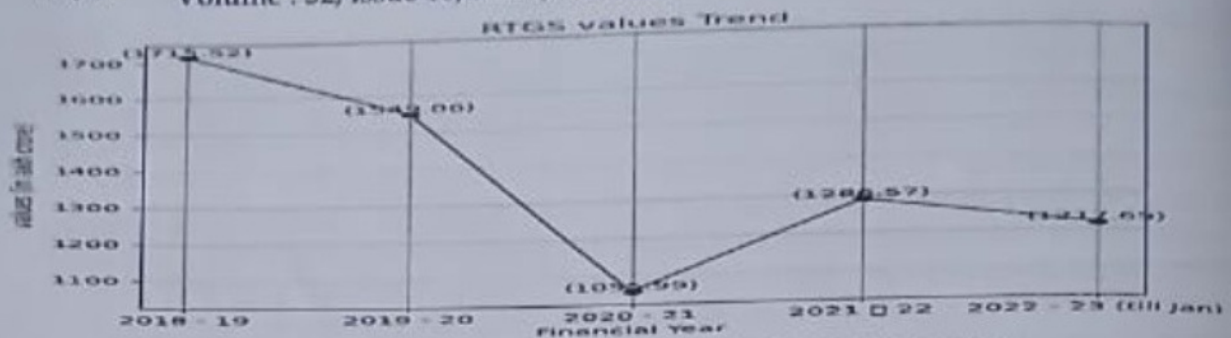


Figure 2.2 Real Time Gross Settlement value from 2018 to 2023

Source: data.gov.in

Figure 2.1 RTGS payment volume shows a consistently increasing trend in its use from 2018-19 to 2021-22 though, the volume of RTGS is quite low as compared to other modes. Highest increase in its volume was in 2021-2022 financial year.

Figure 2.2 The line graph shows that values of RTGS have been decreasing from 2018-19 to 2020-21 from 1715.52 lakh crore to 1055.99 lakh crore which then increased slightly in 2021-22 and again decreased to 1217.69 lakh crore in 2022-23. The highest decrease in the past five year was in 2020-21 financial year which may be due to Covid-19 pandemic.

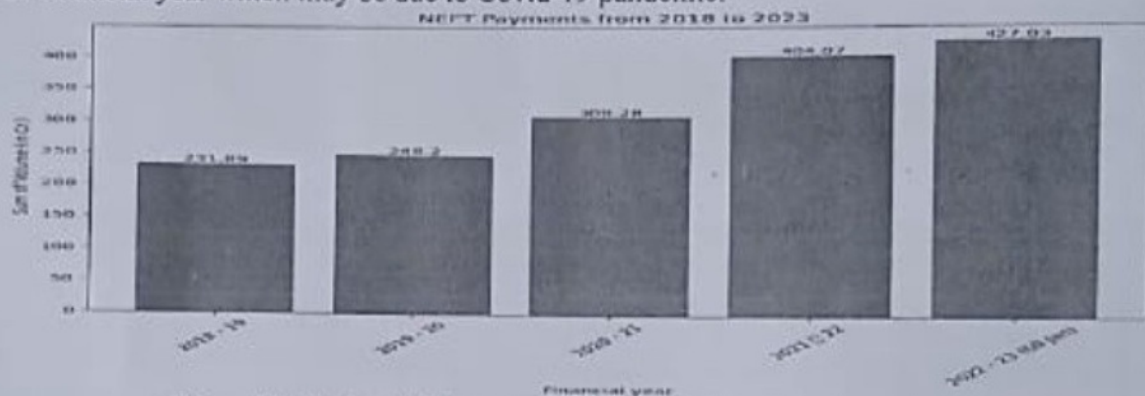


Figure 3.1 National Electronic Fund Transfer volume from 2018 to 2023

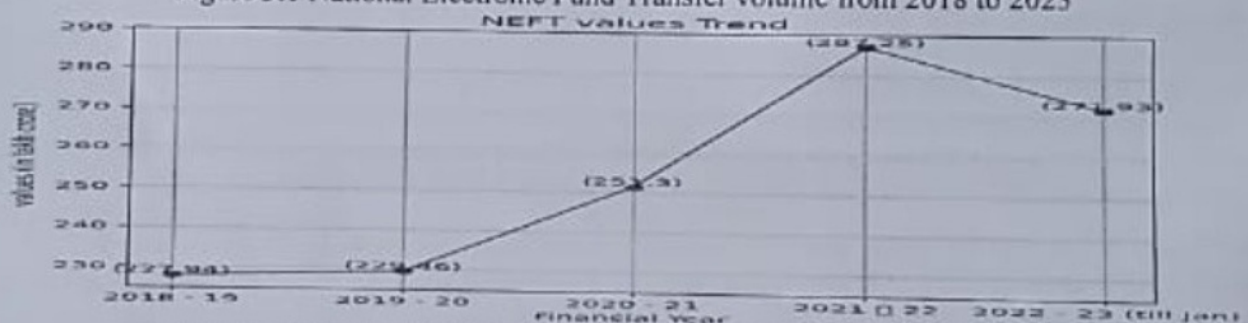


Figure 3.2 National Electronic Fund Transfer value from 2018 to 2023

Source: data.gov.in

Figure 3.1 of NEFT payment shows that its volume is increasing consistently from 2018-19 from 231.89 crore to 427.03 crore in 2022-23.

Figure 3.2 of NEFT line graph shows that from 2018-19 to 2019-20 the amount of NEFT was quite consistent but from 2019-20 to 2021-22 it showed an increasing trend but again values decreased from 287.25 lakh crore in 2021-22 to 271.93 lakh crore in 2022-23.

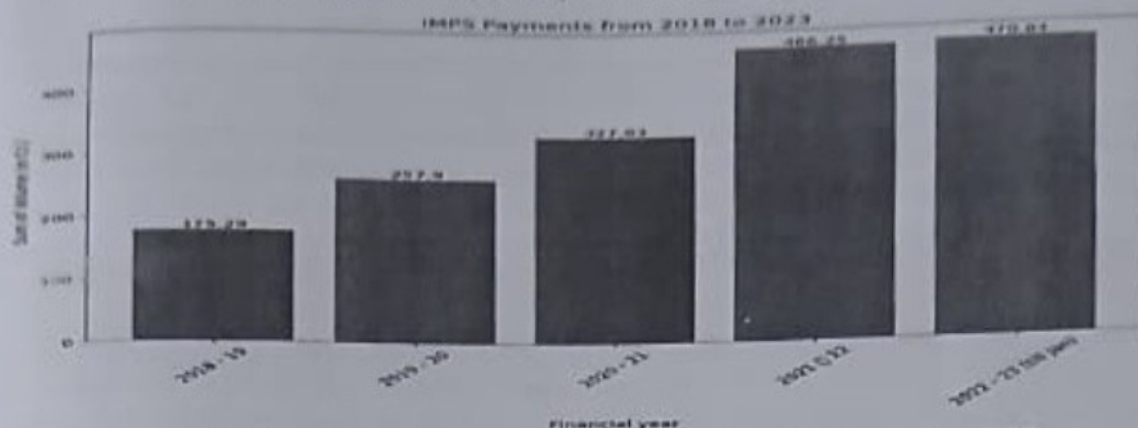


Figure 4.1 Immediate Payment Service volume from 2018 to 2023

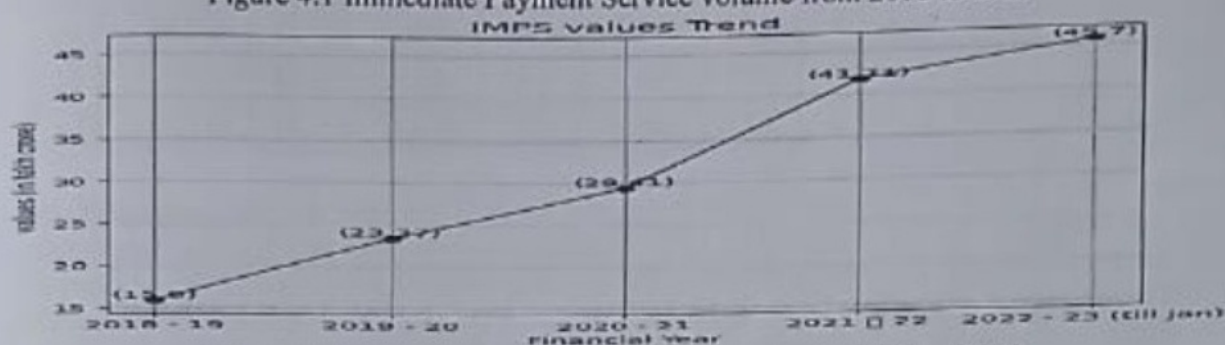


Figure 4.2 Immediate Payment Service value from 2018 to 2023

Source: data.gov.in

From the above figure 4.1 it can be said that after launching IMPS (Immediate Payment Service) in the year 2010 IMPS have shown an increasing trend from 2018- 2023 as in 2018 IMPS volume was 175.29 crore which have increased to 470.84 crore till 2023.

Figure 4.2 IMPS value trend, although shows an increasing trend year after year amount involved through IMPS is quite less which increased from 15.9 lakh crore to 45.7 lakh crore in 2022-23.

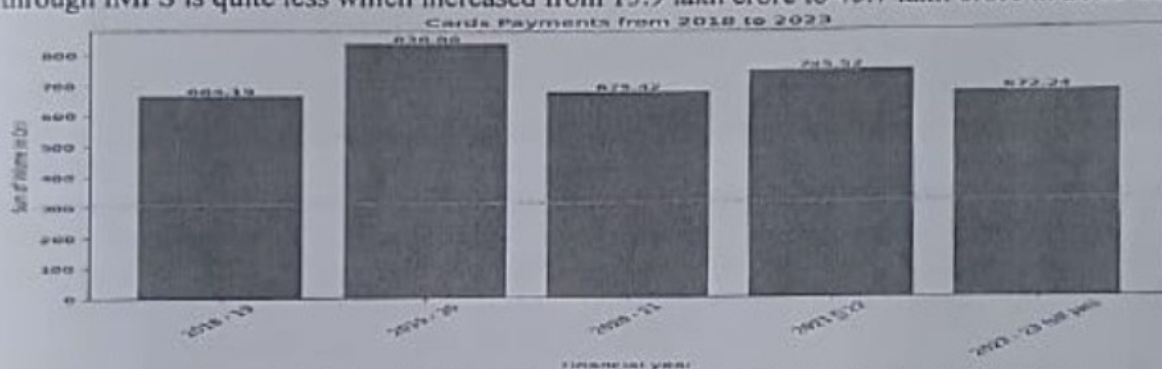


Figure 5.1 Cards- Debit cards & Credit cards volume from 2018 to 2023

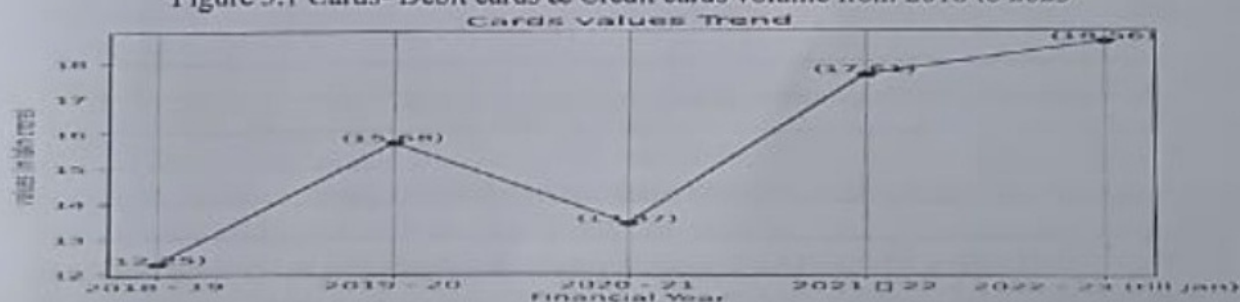


Figure 5.2 Cards- Debit cards & Credit cards value from 2018 to 2023



Source: data.gov.in

From the above figure 5.1 of Card payments volume and card values (figure 5.2) both showed a fluctuating trend in last five year although the volume remained more than 650 crore each year. The highest usage of card was in 2019-20 financial year i.e., 836.86 crore but amount of transaction was only 15.68 lakh crore and highest amount of transaction through card was held in year 2022-23 i.e., 18.56 lakh crore and lowest on 2018-19 i.e., 12.25 lakh crore.

Table 1. Percentage Table showing most used digital payment mode in different years

Modes	2018-19 (crore)	%	2019-20 (crore)	%	2020-21 (crore)	%	2021-22 (crore)	%	2022-23 (crore)	%
Cards	664.19	40.99	836.86	32.06	675.42	18.96	745.52	11.96	672.24	8.06
UPI	535.34	33.04	1251.86	47.97	2233.07	62.70	4595.61	73.74	6752.8	80.94
IMPS	175.29	10.82	257.9	9.88	327.83	9.20	466.25	7.48	470.84	5.64
RTGS	13.66	0.84	15.07	0.58	15.92	0.45	20.78	0.34	19.77	0.24
NEFT	231.89	14.31	248.2	9.51	309.28	8.69	404.07	6.48	427.03	5.12

Source: Compiled by author (data.gov.in)

From above Table 1 it can be interpreted that in the year 2018-19 the most popular mode of digital payment was cards i.e., 40.99% followed by UPI (33.04%) and least used was RTGS. In next year 2019-20 the trend changed and people started using UPI (47.97%) for digital payments and use of other modes decreased gradually. From 2019 UPI volume have increased and till January 2023 80.94% digital payments are done through UPI which have become popular mode of digital payment among customers. RTGS payments have decreased to 0.24% (2023) while other modes like card payment decreased to 8.06% in 2023 from 40.99% in 2018-19, NEFT volume decreased from 14.31% to 5.12% and IMPS volume decreased from 10.82% to 5.64% from 2018 to 2023.

Table 2. Values of Digital payment mode from 2018-2023

Year	Cards (in lakh crore)	UPI (in lakh crore)	IMPS (in lakh crore)	RTGS (in lakh crore)	NEFT (in lakh crore)
2018-19	12.25	8.77	15.9	1715.52	227.94
2019-20	15.68	21.37	23.37	1549.06	229.46
2020-21	13.37	41.03	29.41	1055.99	251.3
2021-22	17.61	84.36	41.71	1286.57	287.25
2022-23 (till jan)	18.56	112.74	45.7	1217.69	271.93

Source: data.gov.in

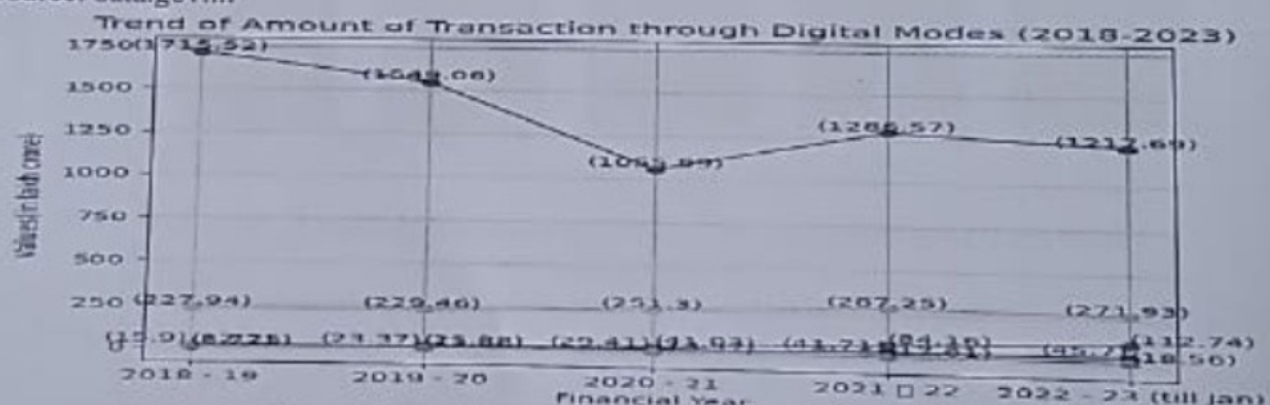


Figure 6. Digital payment mode value in different years

Source: data.gov.in

From the above data it can be interpreted that most of amount involved in digital payment was done through RTGS from 2018-2023 while least amount was paid through cards. It must be noted that UPI



which have dominated all other digital payment mode in volume shows a different scenario where values transacted is less than RTGS and NEFT in past five year.

6.1 Driving factors of digital payment

The Indian digital market is experiencing growth in acceptance of digital payment modes and as a result India is heading towards cashless economy which will constitute 65% of all payments by 2026 also various factors has helped in achieving it. Some of the driving factors for digital payment acceptance are Government policy on digital payment, Demonetization, Covid-19 pandemic encouraging cashless payments, growing Fintech industry and their innovation, availability of low-cost smartphones and internet facility, digitalised toll collection- FASTag [1], perceived ease of use, perceived functional Benefits, availability of resources, government policies, social influence, experience and habit are factors influencing consumers for digital payment method[11]. Price value, awareness, social influence, performance expectancy[12] simplicity, adoption, security and cost other driving factors of digital payment[13].

VII. Limitations of the study

1. The study is limited to 2018-19 to 2022-23 (till Jan).
2. The study only covered major digital payment modes as USSD, AEPS are ignored.

VIII. Conclusion

India's digital payment growth has been tremendous in last five years according to the study in terms of volume as well as value. There is no doubt that India has a dominating position in digital payment and is predicted to be 65% cashless by 2026 [1] as number of internet users which is to reach 900 million by 2025[14] the number of mobile wallet users shall also increase. An interesting fact to note that UPI although have changed the scenario of digital payment of India with huge volume of transaction taking place every day the total transaction value is quite less as compared to volume which hints that ticket size of transaction through UPI is quite less which is opposite in case of RTGS where volume of transaction is less but total transaction value is more.

Future studies on digital payment can be done to see the impact of Central Bank Digital Currency (CBDC) on digital payment and its impact on reduction of cost in managing physical currency as reported by The Indian payment handbook, 2022-27 [15] that in financial year 2021-22, ₹4984 crore was spent for secure printing of banknotes and with accessibility of UPI facility to non-resident from January 2023, launch of UPI123PAY and UPI Lite use of digital payment is expected to increase in rural areas which requires further research. Trend analysis can also be done including other digital payment modes like USSD, AEPS etc.

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