

Digital Payments: Enhancing Financial Market Infrastructures and Retail Transactions

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Abstract:

India is one of the developing countries and had large volume of currency circulation in the country comparing with the other countries like Brazil, China, Kenya, Sweden, South Korea, Thailand etc.,. In the globe a side of many developing and developed countries have been enjoying the benefits by creating highly technological infrastructure in their payment system, but other side India had been following traditional cash less methods like NACH, CTS and NETC etc., due to lack of low levels of initiations from the Governments till 2014. In the year 2015 Digital India Programme was launched by our Prime Minister Shri Narendra Modi with an intention of transforming India into Faceless, Paperless and Cashless. As a part of that, India is also inevitably updated their payment and settlement system from traditional system to new digital payment methods like AEPS, IMPS, UPI, BHIM, Mobile Wallets, and Banking Cards etc., The demonitisation decision inspite of providing various advantages like Curbing the Black money, Transparency and controlling, low cost of currency printing and convenient mode, but also gave considerable growth in digital payments were observed after demonitisation on 8th November 2016. Further Government of India, Reserve Bank of India and NPCI took several initiations and offers financial encouragement to consumers and merchants in order to promote digital transactions. Prime Minister Shri Narendra Modi as stated in the 'Mann ki Baat' 100 per cent cash less is not possible, our intention is make less circulation of money in the society. In this article an attempt is made to brief understand the evolution of cashless economy, need to adopt cashless system, present status of important payment indicators, and initiations taken by the Government, Reserve Bank of India and NPCI towards encouraging cashless economy.

Key words: **SIFMIs, Retail Payments, CBLO, CCIL, INFINET, and IDRBT**

Introduction:

The revolution in Communication, Information and Financial Technology has led to revolutionary changes in e-commerce. The simultaneous developments in hardware, software and networking technologies touched the financial and banking sectors and paved the way for witnessing tremendous changes in payment industry. The number of notable and innovative methods for making payment, which are cheaper but also faster, easier and safer, were developed and penetrated conceptually and practically into the minds of stakeholders of modern digital payment systems. The economies of all modern countries are passing through the digital revolution and every country is striving hard to establish a more efficient, effective, smart and modern digital infrastructure for payment industry to meet every challenge of traditional economy. The modern economies compelling the nations and people to follow digital transactions at

voluminous level by restricting or reducing the use of cash for all micro, medium and macro size of payments. Many developed countries Brazil, Denmark and Sweden and all advanced countries, have effectively shifted towards cashless economy and became the trend model for other developing and under developing countries to follow them. The countries require much involvement and sophisticated infrastructure for possessing the status of digital economy.

Concept of Cash-less Economy

The cashless economy does not refer to a status of economic system where goods and services are exchanged for other goods and services (as is possible in barter system) rather it is an economic setting which discourages use of currency and coins. It should promote and accept digital mode as an alternative but not the wide use of physical currency. The movement and use of currency is the core for traditional economy and usage of digital instruments are the

essence of modern cashless economy. A cashless economy is one in which all transactions are made using credit/debit cards or other digital payment devices and products widely on the one side and the use of paper currency and coins is minimal on the other side.

The cashless economy offers innumerable benefits to the country as well as all the stakeholders of the corporate sector and the individuals. Basically it itself has higher potential to grow faster than traditional cash – based economy as the flow of money enhances. The larger chunk of money lies with the banks for longer time which in turn leads to a stronger liquidity base in monetary system and would lead to availability of funds at lesser interest rates. It reduces the instances of tax avoidance and curb emergence of black money as every transaction details are documented electronically. A more detailed record of all the transactions enhances transparency in business operations and reduces the money laundering cases. The details of digital transactions are easily traceable and make people accountable for every transaction and pin point the corruption sources. The entities do not require preparation of daily cash ledgers as receipts and payments are automated. The digital way is a cost effective approach than the traditional currency- based setting due to the scope of carrying voluminous transactions in a short time. Since there is no need to carry currency note and coins, the risk of theft or burglary can be eliminated in cashless system. In the light of all these benefits, every citizen of this modern economic world wishes to have a stake holder in cashless economy. The digital transactions are the essence of digital economy. The RBI Ombudsman scheme for digital transactions defines a ‘Digital Transaction’ as ‘Digital Transaction’ means a payment transaction in a seamless system effected without the need for cash at least in one of the two legs, if not in both. This includes transactions made through digital / electronic modes wherein both the originator and the beneficiary use digital / electronic medium to send or receive money.”

Review of Literature:

Thomas and Krishnamurthi (2017), “Cashless rural economy- a dream or reality” The study was emphasizes on understanding the impact of demonetisation on rural economy in India. This study was concluded with the various initiatives that to be taken by the government of India in order to make the dream of cashless rural economy in to reality.

P. Shamshadali et al (2018) “Evaluation of cashless economy concept in Indian scenario”, in this article, they focused on evolution and status of cashless transactions methods in Indian context. This study found that the cashless economy in India is successful economic development program since its beginning and with the improvement in

technology infrastructure variety of electronic payment methods are available in the market.

CMA Dheeraj Kumar Pradhan (2019) has conducted study with the objective of evolution of Digital banking and its challenges in India. He analyse the digital banking, demonetisation effects on Indian economy, various challenges in moving digital banking. He concluded that the Government and other stakeholder plays an important role in providing sufficient digital infrastructure, cyber threats and internet frauds in transforming India into digital one.

Dr.V.Chandrakala (2019) in her article titled “A STUDY ON CASHLESS ECONOMY IN INDIA” was revealed various modes of cashless transactions, benefits available, and challenges faced by the cashless economy. This article concluded that response of people, Government support towards moving to the cashless economy is likely to succeed through the e-commerce transactions, which will led to increase GDP of the economy.

Manan Dixit (2021) has examined the significant effect of technology in India towards the changing of financial landscape, as it claims 98.50% over the non- cash payments in India. According him digitalization has become one of the important pillars of India when compared with rest of the world. He also illustrated that UPI, Phone Pe, Google pay and pay tm has been hiked their contribution in digital transactions, and technology is being amped up even in kirana stores also. He finally concludes that, in India banking and financial service sectors still struggling certain challenges like: providing quality internet connection, making awareness, dispute management process, cyber hacking etc.

Sudha.G et al (2023) in their article “Impact of Covid-19 Outbreak in Digital Payments”, revealed about the impact on digital payments during COVID-19 and problems faced by them during digital payments. This study also analyse the various modes for digital payments. This study found that the Reserve Bank of India asked to customers to use digital payments during COVID pandemic and Govt. instruct the banks to motivate digital payments usage.

PRESENT STUDY

The present study deals with the emergence, development and performance of digital payment methods/instruments that penetrated in Indian financial system. Digital payments are get effected through and with the infrastructure, networking and technological adoptions of banking sector. In every country, banking sector play a crucial role in its economy and financial system. It’s role is increasing beyond the traditional functions of accepting deposits and giving loans and advances. The digital banking infrastructure and networking is facilitating the development and maintenance of an efficient and cost effective payment

system to meet the requirements of business entities, government agencies/departments and general public. It is also providing accessibility to and provision of so many financial services to the public. Even in the modern digital set up, the individuals and entities require an account in banks to carry the financial transactions. Any payment get effected by digital mode should be recorded in the customer account maintained by the bank. To meet the ever increasing requirements and expectations of the public, the banks are bound to provide the infrastructure and popularizing among the public to adopt it for better services.

The Indian banking sector has been witnessing and passing through the dynamic technology environment as it is compelled to forgetting the manual recording process and move towards digitalisation of every transaction. The Internet, Information Technologies, and networking technologies have changed the way of functioning of banks and financial institutions. Though these technologies were introduced in the late eighties, the current phase of IT revolution is more intense and impactful in banking sector. The simultaneous developments in all these technologies, made the banking sector to bring so many changes in the operations management of banks and traditional payment process and instruments. From the concept of “banking in banks branches only” to the concept of “any time and everywhere banking”, the technology made the banks and public to change their operations and modes. The modern digital payment systems have changed the payment process so easy, convenient, transparent and secure and encouraging the participants to experience them. This study is an attempt to examine the growth in the business of some popular payment systems in India.

Research Methodology

This study is based on using data or information from secondary sources. The secondary data are collected from the bulletin published by the Reserve Bank of India, reports published by NITI Aayog, relevant websites, newspapers, books and e-books, previous published articles, conference papers, case studies, magazines and various reports. This study covers a period of ten years starting from 2011-12 to 2021. The scope of study confined to Systemically Important Financial Market Infrastructure (RTGS, CBLO, Government Securities and Forex Clearings) and Select Retail Payments (CTS, NACH, Credit Cards, Debit Cards and Prepaid Payment Instruments) which are popular in Indian payment industry.

Objectives:

1. To informing the Major Events in the Emergence of Digital payments in India
2. To list out the Components in Payment and Settlement System in India
3. To Codifying the Trends of Systemically Important Financial Market Infrastructure and select Retail Payments.

Major Events in the Emergence of Digital payments in India

In India, the payment system is witnessing so many changes and a silent revolution is going on since four decades. The Barter system was used to adopt for making payments and settlement before the emergence of money concept. In the next stage the economic transactions were settled in the form of irreplaceable things such as silver and gold coins, and later these coins were replaced by the silver coins issued by Government. Finally the coins and paper currency are being used as instruments for payment. With the evolving of banking system, the economic transactions settlement became fast and could transfer money easily by giving an instruction to the banks through the instruments like cheques and demand drafts. Mean while with the technology has new heights globally; innovative payment modes were developed in payment system and it eventuates in India too.

The Reserve Bank of India inaugurated in the year 1935, since then it took many initiatives for the development of payment systems. It appointed various committees of experts time to time on the matters relating to payment instruments, development of infrastructure, regulatory mechanism, and adoption of technology. In addition to these, the emergence of Core Banking Solutions technologies paved the way for witnessing many changes in banking and payment industries. As a result, the First Credit Card was issued in 1981 by Andhra Bank, India's First ATM by HSBC in 1987, introduction of Magnetic Ink Character Recognition(MICR) technology for standard cheque processing in late 1980s, introduction of uniform regulations for clearing houses, establishing the BANKNET, Electronic Clearing Services (ECS) and Electronic Fund Transfer (EFT) in 1990s, inauguration of Indian Financial Network(INFINET) in 1999, setting up of Institute for Development in Research in Banking Technology(IDRBT), establishment of Clearing Corporation of India Ltd.(CCIL) in 2001, introduction of National Electronic Fund Transfer (NEFT) in November 2005, Real Time Gross Settlement (RTGS) services in March 2004, establishment of National Payment Corporation in 2008, granted permission to non-bank entities to start their own ATMs christened as White Label ATMs in 2012,

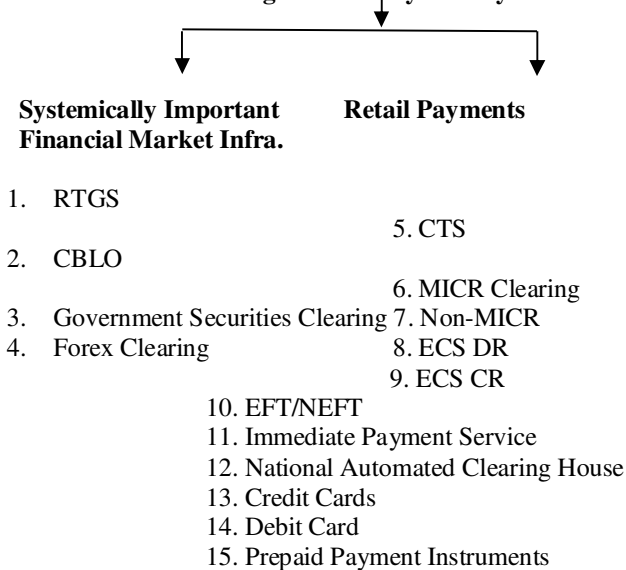
permitting non-bank finance companies to setup payment banks in 2014, etc., were the major initiatives made by the RBI.

Components in Payment and Settlement System in India

The components in the Indian payment and settlement system can be bifurcated into two main segments. The first segment consists of instruments which are covered under Systemically Important Financial Market Infrastructure (SIFMIs) and the second segment consists of Retail Payments. The list of instruments covered under the same are mentioned below:

developed a money market instrument called Collateralized Borrowing and Lending Obligation (CBLO) CBLO facilitates unwinding of both borrowing and/or lending positions before maturity. The Government Security (G-Sec) is a tradable instrument issued by the Central Government or State Governments, these may be Short-term (Usually treasury bills having maturity period of less than one year) or long-term (the Government bonds usually maturity period of one year or more). G-Securities carry practically no risk of default and are called risk-free gilt-edged instruments. The term 'Forex' stands for Foreign Exchange. In India the settlement of Forex transactions is done by CCIL which was started in November, 08 2002. This segment accepts the inter-bank Cash, Tom, Spot and Forward USD-INR transactions. The Cheque Truncation System (CTS) is the process of stopping the flow of the physical cheque in its way of clearing. In its place, an electronic image of the cheque is transmitted with key data. The Reserve Bank of India (RBI) has introduced CTS system for faster clearing of cheques. The credit card is a banking card, issued by the financial company. That allows the cardholder to borrow money, purchase products and services on the condition that the cardholder repays the original loan amount plus any additional costs (Interest) agreed upon. The issuer establishes borrowing limitations based on the individual's credit score. These cards are suitable for domestic as well as international use. The debit card/bank card is a type of payment card that deducts funds straight from a customer's bank account to purchase of goods or services. Debit cards normally have daily purchase restrictions, so it's unlikely that you'll be able to make a particularly significant purchase with one. They prevent the user from going into debt. The Prepaid Payment Instruments (PPIs) are payment instruments that enable the purchase of goods and services, such as financial services and remittance services, against the value held on the instrument. There are three forms of PPIs that can be issued in the country are (i) Closed System PPIs, (ii) Semi-closed System PPIs, and (iii) Open System PPIs.

Segments of Payment Systems:



Data Analysis on Systemically Important Financial Market Infrastructure, select Retail Payments and their Trends:

The present study covers Systemically Important Financial Market Infrastructure (RTGS, CBLO, Government Securities and Forex Clearings) and Select Retail Payments (CTS, NACH, Credit Cards, Debit Cards and Prepaid Payment Instruments) The Real Time Gross Settlements (RTGS) is a payment software package which provides online settlement of payments between financial institutions. It is a large value funds transfer system whereby financial intermediaries can settle interbank transfers for their own account as well as for their customers. It enables quick processing of cheques and instantaneous clearing. The Clearing Corporation of India Ltd. (CCIL) introduced this instrument with effect from January 20, 2003 and has

**TABLE-1
ANNUAL TURNOVER OF SELECT SYSTEMICALLY IMPORTANT FINANCIAL MARKET INFRASTRUCTURE DURING 2011-12 TO 2023-24**

Year	RTGS Transactions		CBLO Transactions	
	Value (Rs. in billion)	Volume (in million)	Value (Rs. in billion)	Volume (in million)
2011-12	539308.00	55.00	111554.00	0.10

TABLE-2:
ANNUAL TURNOVER OF SELECT RETAIL PAYMENTS DURING 2011-12 TO 2023-24

Year	CTS Transactions		NACH Transactions		Credit Cards Transactions		Debit Cards Transactions		Pre Paid Instruments Transactions	
	Value (Rs. in billions)	Volume (in millions)	Value of (Rs. in billions)	Volume (in millions)	Value of (Rs. in billions)	Volume (in millions)	Value of (Rs. in billions)	Volume (in millions)	Value of (Rs. in billions)	Volume (in Millions)
2011-12	15104.00	180.00	-	-	966.00	320.00	534.00	327.50	62.00	30.60
2012-13	21780.00	275.00	-	-	1230.00	396.60	743.00	469.10	79.00	66.90
2013-14	44691.00	591.40	215.00	86.50	1540.00	509.10	955.00	619.10	81.00	133.60
2014-15	66770.00	964.90	1221.00	340.20	1899.00	615.10	1213.00	808.10	212.00	314.50
2015-16	69889.00	958.40	3802.00	1404.10	2407.00	785.70	1589.00	1173.50	488.00	748.00
2016-17	74035.00	1111.90	7916.00	2057.30	3284.00	1087.10	3299.00	2399.30	838.00	1963.70
2017-18	79451.20	1138.00	10736.10	2503.30	4589.60	1405.20	4600.70	3343.40	1416.30	3459.00
2018-19	81536.00	1111.70	52246.10	4830.00	6034.13	1762.60	5934.75	4414.30	2133.23	4607.20
2019-20	55744.50	953.19	71816.60	7340.00	7308.95	2177.30	7039.20	5061.10	2155.58	5331.80
2020-21	56213.50	670.36	86890.60	9630.00	6304.14	1764.10	6626.67	4020.00	1976.95	4939.20
	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)
2021-22	6650333	6999.12	12.8	18,758	9.7	22,399	7.3	39,384	66.5	6,999
2022-23	7172904	7109.28	15.4	19,257	14.3	29,145	7.2	34,179	71.7	7,109
2023-24	72123.33	663.21	15.3	16227.2	18.3	35,610	5.9	22,860	72.1	6,632
	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)
2012-13	676841.00	68.50	120480.00	0.20						
2013-14	734252.00	81.10	175262.00	0.20						
2014-15	754032.00	92.80	167646.00	0.20						
2015-16	824578.00	98.30	178335.00	0.20						
2016-17	981904.00	107.86	178335.00	0.22						
2017-18	1167124.00	124.46	283307.60	0.20						
2018-19	1356881.00	136.63	325920.60	1.30						
2019-20	1483133.00	150.70	401421.90	1.60						
2020-21	1055998.00	159.20	568509.60	2.26						
	Value (Rs. in Crores)	Volume (in in Lakhs)	Value (Rs. in Crores)	Volume (in in Lakhs)						
2021-22	1,286.6	2,078	2,068.7	3.30						
2022-23	1,499.5	2,426	2,588.0	4.10						
2023-24	1,708.9	2,700	2,592.1	4.30						

turnover of RTGS has increased from Rs.539308.00 billions to Rs.1055998.00 billions in value during the study period. The volume of transactions increased from 55.00 million to 159.20 millions, witnessing a high increase in the years 2015-16, 2016-17 and 2017-18 and an exorbitant increase in the year 2018-19. Though the same trend is observed in both, relatively a high rate of increase observed in Value of transactions. The Volume of CBLO transactions increased from 0.10 million in 2011-12 to 2.26 million transactions in 2020-21. The value of CBLO transactions increased from Rs. 111554.00 billion in 2011-12 to Rs. 568509.60 billion in 2020-21. Both in Value and Volume, the turnover figures shows robust increase from 2016-17 onwards. Comparatively the Government securities transactions and forex clearing transactions are high in Value and Volume. It is portrayed as high chronicle to RTGS and CBLO transaction and shown a substantial increase in both Value and Volume. The CBLO and Government securities transactions stands least volume with 0.10 million and recorded highest value of 1106343.10 billion amongst all these. A significant observation is that all the payment systems recorded a phenomenal increase in Value and Volume figures from 2015-16 and continued up to 2020-21. The reasons that can be attributed to this trend are demonetization of high value currency notes in November, 2016 and the Digital India Programme initiatives of Indian

Table-I present the details of Systemically Important Financial Market Infrastructure and their Annual Turnover (both in value and volume of transactions) during the period 2011-12 to 2023-24. The table divulges that the

Government in July, 2015. Due to COVID pandemic, there is a decrease in the turnover of RTGS in the terminal years.

Table-II dispenses the particulars of select retails payments and their annual turnover during the period of 2011-12 to 2023-24 in terms of value and volume of transactions. Amongst digital modes of payments, the number of transactions undertaken using NACH increased from 0.00 billion to 86890.60 value of transactions in billion and 0.00 million to 9630.00 volume of transactions in million (which were registered highest in the table) during 2011-12 to 2020-21. Transactions through Cheque Truncation System rose from 15104.00 value of transactions to 56213.50 value of transactions during the period of 2011-1 to 2020-21, in 2018-19 it recorded highest value of transactions with 81536.00 billion. During 2019-20 the number of card transactions carried out through credit card is high with value and volume of 7308.95 billion and 2177.30 million respectively. Comparatively the transactions through debit card and pre paid instruments are low in Value and Volume. It is depicted as next to NACH, CTS and Credit card transaction and shown a significant increase in both Value and Volume. The value of pre paid instruments transactions and volume of credit card transactions stands least amongst all these. A sententious observation is that all the payment systems recorded a remarkable increase in Value and Volume figures from 2015-16 and continued up to 2020-21. The reasons that can be imputed to this trend are demonetization of high value currency notes in November, 2016 and the Digital India Programme initiatives of Indian Government in July, 2015. Due to COVID pandemic, there is a decrease in the turnover of RTGS in the terminal years. The nationwide lockdown due to COVID-19 pandemic led to freezing in digital payments resulted decline in value and volume of payments. However they have picked up with the step by step relaxations in lockdown.

Conclusion:

The Government of India, Reserve Bank of India and National Payment Corporation of India have collectively taken many initiations to fulfil the dream of cashless economy make into reality, as a result enormous growth in digital payments was occurred. Even though Digital Payments in India have been hiking progressively, certain obstacles are exists in transforming India into Cashless economy. The considerable obstacles are: India is cash based economy, ATMs are mainly using for cash Withdrawal purpose not for online settlement, lack of infrastructure facilities, awareness among the people about digital and financial technology, many business people and public reluctant to use digital payment as it is not safe and secure,

and low quality internet infrastructure and services in rural areas and even metropolitan cities. The Government of India and some Public Sector Undertakings announced special incentives to encourage digital payments on making transactions for provision of services through public networks and digital infrastructure: Government petroleum companies offered discount at 0.75% on payment for petrol and Diesel, Indian Railways announced a discount up to 5.% on their services, Insurance companies offered discount (up to 10% in case of GIC and 8% in case of LIC) to the public who are making cashless transactions, Public Sector Banks charged a low or no charges on Card-less payments, and the Income Tax Department imposed a lower rate of tax on digital turnover up to 2 Crores. As Shri Narendra Modi, The Prime Minister of India, address in his 'Mann ki baat' on 27th November 2016 'Our dream is that there should be a cashless society'. Though 100 per cent cashless society is never possible, but we can make a start with a less-cash society, and then cashless society will not be a far-off destination. Towards attainment of betterment in present status, there is a need for: upgrading the infrastructure, adopting the technology and international standards, innovation of easy and secure products to be handled by digital illiterates, enhancing access to banks, developing efficient grievance system, provision for opening bank accounts online, tax concessions on smart phones, reduction in charges on transactions of high value payment systems, compelling the public in cities to make digital payments for public utility services, and endeavors to inculcate digital payment practices among young students. Every initiative has to be looked upon for building up of cashless economy and all the stakeholders have to play their due role.

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