

Digital Payment System Development in India

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ABSTRACT: *Digital payment methods have been growing exponentially owing to global progress in technology and high product ranges. The adoption of digital payments has gained momentum in India over recent years. Demonetization has played a prominent role in the growth of online payment technologies in the country. Nationwide lockdown during the Covid-19 pandemic has also boosted the digital payment systems in India. The present paper reviews the development of digital payment services. The paper also discusses the various modes used for digital payments in India. The study highlighted the increased use of the Unified Payment Interface (UPI) network and other payment apps for digital money transactions. Moreover, the paper studies the impact of the development of digital payment services in India. The paper is based on secondary data, taken from the RBI bulletin, Annual Reports, various research papers, journal articles, and websites. The results demonstrated that digital payments have increased convenience and transparency in payments but have provoked security and reliability issues in financial transactions. The research evidence that the digital payment systems certainly benefited the people having a low and middle income, which will eventually help to boost the economy of India.*

Keywords: Digital Payment, online transaction, mobile banking, digital wallets,

Introduction

Digital Technology has expanded worldwide over the last two decades. The need for contactless retailers to follow digital infrastructure through cameras and sensors is increasing as a result of artificial intelligence (Rulić et al., 2017). Digital payment services were introduced to make clear financial transactions and eradicate money laundering from society. Moreover, digital payments were promoted to ensure the appropriate availability of cash in banking institutions for supplying credit to people (Baghla, 2018). Digital payments refer to consumer transactions for goods and services done at a point of sale (POS) via using debit and credit cards and through online banking or mobile banking. Traditionally the preferred mode of payment of people was cash, cheques, and demand drafts.

Nowadays consumers have been liberated from the chronological and spatial limits of regular business under new developments in mobile and wireless technologies (Balasubramanian et al., 2002). Technological innovations have enhanced the transformation of the general public from cash payments to electronic payment (E-payment) modes. Sahi et al. (2021) argued that the most important elements determining buyers' intentions of using online payment were their hopes for successful digital transactions and convenience, but alleged threat and trust were examined as hindrances in the adoption of digital payment methods. However, A large portion of the community has already adopted the use of digital techniques for their payments in the last few years. In business transactions, consumers

frequently use smart cards and phones in a secure manner (Dewan & Chen, 2005).

One of the essential objectives of the Government of India (GOI) is to move digitally (Kedar, 2015). The government has adopted several measures for assisting the country to move towards a cashless economy. The 'Digital India' program was initiated by the GOI under the Ministry of Electronics and Information Technology in 2015 to change India into a knowledge-driven and digitally empowered economy (Nagpal et al., 2020). Among the main perspectives of this program, significant attention was given to the digital payment system. Banks have been given access to a promotional and awareness framework for digital payments (Ministry of Electronics & Information Technology). Different kinds of digital payment systems like Credit/Debit Cards, Mobile Banking, Mobile wallet system, etc., are assisting consumers in conducting their financial transactions. Demonetization, announced by PM Modi in November 2016, has also promoted cashless transactions in India (Fouillet et al., 2021). The number of bank accounts has increased after the implementation of demonetization in India. E-commerce business has also pushed the digital payment mode in recent years as consumers purchase from online shopping sites like Amazon, Flipkart, Alibaba, etc.

The study conducted by Patil et al., (2018) reviewed digital and mobile payment adoption. They revealed that in most studies, performance, anticipation, and possible usefulness were found to be the most important factors which clear the intent of customers for using mobile

payments, but the alleged risk was recognized as an obstacle to the adoption of digital payment methods. Similarly, Vashistha et al. (2019) in their study found that the customers interested in using mobile payments were apprehensive owing to the incomprehension of technology and the lack of an appropriate remedy for transactional problems. They further revealed that mobile payments were seen as an unneeded hassle by traders. Vaidya et al. (2020) found in their study that people choose digital payment platforms over the regular payment process and the use of digital payment facilities depends upon the age, education, and job profile of the consumers. A survey conducted from 1,537 consumers in 2020 by the Federal Reserve concluded that only 19 percent of consumers choose cash as a mode of payment whereas 27 percent of consumers pay by using credit cards and 28 percent of consumers use the debit card as a mode of payment (Steele et al., 2021)

The outbreak of Covid-19 has rapidly increased the use of online transactions and mobile payment systems worldwide. Smartphones and mobile payment appliances are gaining in popularity in the present-day world and are frequently used for online payments through mobile apps. Traders and consumers have adopted digital payment systems rapidly amid the pandemic. Purba et al. (2021) conducted a study in Indonesia and revealed that consumers in Indonesia choose digital technologies for payment to outlive during the Covid-19 pandemic. National Payments Corporation of India (NPCI) encouraged Indians to use digital payment facilities in times of crisis to control the spread of disease. In August 2020, a program was

proclaimed to test technology that would allow digital payments to be made even in rural areas where internet access is either non-existent or spotty (RBI Bulletin, 2021). Attitudes of the public toward the payment mode have taken 360 degrees turn during the pandemic. During the 2020-21 fiscal year, the payment systems grew by 26.2 percent in volume, whereas digital transactions accounted for 98.5 percent of total non-cash retail payments (RBI Annual Report, 2020-21). Das et al. (2020) found in their study that BHIM-UPI usage has increased for digital money transactions after the outbreak of the Covid-19 pandemic. It is found that Pay TM, Google Pay, PhonePe and Amazon Pay apps have become significant sources used by consumers for digital transactions in India (PTI, 2020). The present study attempts to examine the development of digital payment services, study the various modes of digital payments in India, and study the impact of digital payments on the Indian Economy.

Data Sources and Methodology

The paper is based on secondary data. The data on the development of the digital payment system in India is taken from the websites of the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI). The data on the volume and value of digital payment systems from 2018-19 to 2010-21 is taken from the RBI Handbook of Statistics on the Indian Economy 2020-21. The data on changes in payment preferences and various preferred modes of digital payments in India is collected from the Reserve Bank of India, Payment and Settlement Systems in India. the RBI bulletin, RBI Annual Reports, various research papers, journal articles, and websites.

Results and Discussions

Developments in Digital Payment Systems

An act relating to the regulation and control payment system in India with the Reserve Bank of India (RBI) as the regulatory and supervisory authority was passed in 2007 This act is known as 'The Payment and Settlement Systems Act, 2007' (The Payment and Settlement Systems Act, 2007). RBI has taken a large number of initiatives to promote digital payment techniques for consumer ease along with strengthening security. National Payments Corporation of India (NPCI) was founded by the Reserve Bank of India and the Indian Banks Association in December 2008 to manage retail payments in India. Subsequently, various developments were made for the proper functioning of digital payments in India as shown in Table – 1.

Table-1
Developments in the Digital Payments System in India

YEAR	Development in Digital Payments Methods
2008	NPCI was established to manage retail payments in India.
2009	The Aadhaar system is being rolled out across the country.
2010	IMPS and PPIs have been launched.
	Online Payment Gateway Service Providers (OPSGP) guidelines were developed.
2011	A scheme of Aadhaar-based Direct Benefit Transfer (DBT) through the Aadhar Enabled Payment System (AePS) and National Automated Clearing House (NACH) was launched which allows money to be deposited straight into the bank account of the recipient.
2012	RuPay was launched by NPCI in March.
	The Merchant Discount Rate (MDR) policy was introduced.
2013	The Padmanabhan committee was formed to investigate GIRO-based payment methods.

2014	Payments bank guidelines were formed in July.
2015	In May, criteria for contactless payments were created.
2016	Unified Payments Interface (UPI) and National Electronic Toll Collection (NETC) systems have been launched.
	The system of Aadhaar-based authentication for card-present (CP) transactions has been introduced.
2017	MDR for debit card transactions is being rationalized.
	The Bharat QR Code has been launched.
	Bharat Bill Pay System (BBPS) is introduced for bill payments.
	FASTag (Federal Automated Toll Collection System) for toll payments is launched.
2018	Interoperability guidelines for PPIs/Wallets are being developed.
2019	The 'Digital India' Campaign was launched.
	National Common Mobility Card (NCMC) was launched in March.
	FASTag has been made compulsory for all automobiles.
	Reimbursement guidelines for MDR are being developed.
	'Tokenisation-Card Transaction Services' guidelines are being formed.
2020	The Ombudsman Scheme for digital transactions has been introduced.
	RBI issued the guidelines for greater card transaction security and improved convenience for the user in January.
	RBI issued the guidelines on the Regulation of Payment Aggregates and Payment Gateways in September.
2020	RTGS becomes available 24 hours a day on all days of the year from 14 December.
	RBI Issued guidelines for Digital Payments, Security Controls in February.
2021	RBI Issued guidelines for Digital Payments, Security Controls in February.

Source: Websites of RBI and NPCI

Various Modes of Digital Payments in India

Banking Cards – Banking cards like Debit/Credit Cards are used to transfer payment from one bank account to another bank account. These cards provide more security to consumers and are commonly used in India. The cardholder can also use these cards to pay bills, payment for shopping in stores, and for online shopping payments. Many other payment cards like RuPay, Visa, and Mastercard are also used by consumers and traders in India.

National Electronic Fund Transfer (NEFT) – NEFT originated in 2005 by the Reserve Bank of India. The amount up to Rs. 10 lakhs can be transferred to any account through NEFT. This service is available 24 hours a day, 7 days a week. It can take up to 2 hours for the transfer to take place.

Real-Time Gross Settlement (RTGS) – This system is operated by the Reserve Bank of India. By using RTGS, amounts up to Rs. 2 lakhs can be transferred to any account. From 14 December 2020, the RTGS system went active 24 hours a day, 7 days a week. The money sent by RTGS was delivered instantly.

Immediate Payment Service (IMPS) – IMPS was introduced as an instant money-sending option at that time when NEFT was not available 24 hours a day. This electronic fund transfer service is used to access bank accounts and manage inter-bank transactions. The amounts up to Rs. 5 lakhs can be transferred instantly by using IMPS. The transaction charges in the case of IMPS are higher than NEFT.

Unified Payment Interface (UPI) – UPI was developed by the National Payment Corporations of India (NPCI) and introduced in India in August 2016 for money transfers directly from banking institutions. The amounts up to Rs. 1 lakh per day can be transferred by using UPI. There are no transaction charges for the payment by UPI. Apps like Google Pay, PhonePe, Bhim, etc., work on top of the UPI system. These UPI-based apps link to the bank account of the account holder and the transfer happens directly from account to account. The money can also be transferred from any UPI app to any other UPI app with the UPI ID of the person to whom the money wants to transfer.

Mobile banking – The services offered to its clients by the bank to carry out financial operations by using mobile devices like smartphones come under mobile banking. The transactions are completed by the use of mobile banking apps provided by the banks for payment purposes. A person can pay bills and transfer funds into another person's account by using mobile banking. This service is available 24 hours a day and 7 days a week.

Digital Wallets – There are many digital wallets like Paytm, MobiKwik, etc., which can be used to send money from one person to another. Digital wallets are designed to hold cash in digital form. Most of these services allow sending money only up to smaller limits and have no associated transaction charges. With the rise of UPI apps, wallet payments are not very frequently used.

Many types of digital wallets, mobile banking, and UPI payment apps are used to proceed with the digital form

of payment in India. Some of these apps are as follows;

Bharat QR Code – Bharat QR Code is a cross-platform payment solution that can accept payments from Visa, MasterCard, and RuPay cards. There is no cost associated with the use of the Bharat QR Code. The amount of the trader has been received in the bank account immediately, whose payments are accepted through the Bharat QR Code.

Google Pay – It is a UPI Payment App by which a person can transfer money to any other person, can do online shopping, and pay bills directly from his bank account. Google Pay requires a passcode or physical authentication to activate. It creates a virtual account number that represents the account details of the user. To keep client payment details confidential, it sends a one-time security code to the customer.

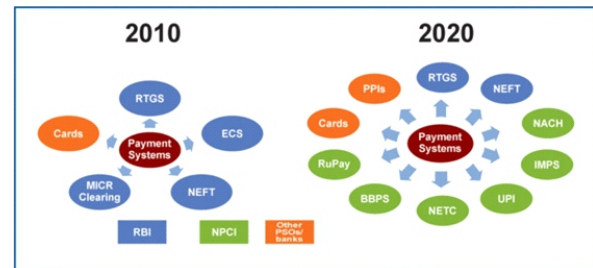
BHIM app – A Mobile App, Bharat Interface for Money (BHIM) is developed by the National Payment Corporation of India (NPCL) for quick payment transactions. It is based on the UPI (Unified Payment Interface). Scanning and paying with a QR code is possible with this app. BHIM app was launched by Prime Minister Modi on 30 December 2016 for simplifying digital payments for consumers (Hindustan Times, 2017). Users of this app can send and receive money using their Aadhar number, bank account number and IFSC code, and mobile number.

Other apps – Phonepe, PayTM, Mobikwik, mRuppee, Jio Money, Airtel Money, etc., are some other apps that are used for online payments by consumers and merchants.

Change in Payment Preferences over the Last Decade

Payment system provision by banks was long viewed as both a vital public service and a possible springboard for a variety of other services. Due to the proliferation of payment methods over the past ten years, consumers now have a wide range of payment options. The use of mobile-based payments has been made easier nationwide with the development of lightweight acceptance infrastructure (QR Codes). India has seen an enormous increase in payment methods and a substantial change in payment preferences over the last ten years (Figure 1).

Figure 1: Change in Payment Preferences over the Last Decade



Source: Reserve Bank of India, Payment and Settlement Systems in India.

Table - 2
Volume and Value of Digital Payment Systems During the Last Three Years
(Volume in Lakh and Value in Rs. Crore)

Payment Systems	2018-19		2019-20		2020-21	
	Volume	Value	Volume	Value	Volume	Value
RTGS	1366	135688187	1507	131156475	1592	105599849
NEFT	23189	22793608	27445	22945580	30928	25130910
Credit Cards	17626	603413	21773	730895	17641	630414
Debit Cards	44143	593475	51239	804870	40146	661385
IMPS	17529	1590257	25792	2337541	32783	2941500
UPI	53915	876971	125186	2131730	223307	4103658
BHIM Aadhar Pay	68	815	91	1303	161	2580

Source: RBI Handbook of Statistics on the Indian Economy 2020-21.

Challenges in the Adoption of Digital Payments System

- There is a disparity in the pace of adoption of digital payments in India due to a lack of digital financial awareness and digital financial literacy. Many consumers lost their money while transacting online due to a lack of knowledge and lengthy procedure. Moreover, several older people do not know digital payment techniques.
- Poor connectivity in rural areas and underground markets is a major

issue in the success of digital payments. Several rural communities lack the necessary infrastructure and technology to embrace digitalization and therefore the residents become unable to adopt digital payment facilities.

- Sometimes the hit-or-miss compatibility of banks with the payment apps suffers a lot to the consumers. Some payment apps take a long time to verify a mobile number and several times fail to verify.

● The cost of digital transactions can be an obstacle to digital payment adoption by consumers. Many retailers take additional charges as the transaction cost from consumers for every debit card transaction. The service fee associated with moving money from wallet to a bank account is also carried by the consumers.

● The high cost of setting up acceptance of digital payment infrastructure such as point-of-sale (PoS) deters several petty traders to adopt these payment techniques.

● Cybercrime and the security of data are major threats to online transactions. There is always a concern about the privacy and security of data exchanged through the internet. Hackers can misuse and manipulate the personal data of consumers and traders.

Impact of Digital Payment Systems Development on India

The government of India's substantive agenda, 'Digital India' aims to turn India into a digitally enabled and knowledge-based economy. The government's policy approach emphasizes the digital payment sector's great development potential. The advent of several digital payment techniques during the last ten years has resulted in a tremendous rise in digital transactions in India. RBI has made great efforts to create a payment ecosystem wherein both banks and no-banks can live and grow simultaneously, which is a good prospectus for the expansion and progress of the digital payment system in India. The government has taken various measures to aware consumers of online transactions. The controller and other PSOs have made considerable strides by dint of informational programs such as, 'BI Kehta Hai' and eBaat. Moreover, the

introduction of FinTech companies in the payments market has accelerated the growth of the payment ecosystem. It is predicted that card transactions will expand by more than 20 percent in 2025 in the country, as cash payments will shift to cards and other digital payment methods as a result of government push and rising digital insights (PWC, 2020).

The business strategy of traditional banking agencies is changing in the current universe. A wide range of banks are going digital for their miscellaneous services. In addition to digital models, hybrid banking models are existing which also combine public and private clouds with traditionally arranged techniques. The electronic fund transfer system has experienced a significant public impact since it provides a quick transfer of benefits to residents while also improving the productivity, clarity, efficacy and responsibility of the payment system. digital payments provide a consistent experience to clients. Online payments are favored because of their reduced reliance on cash, rapid transfer speeds, and convenience of use. Cash managing and handling is a time-consuming and exhausting process. Aside from the possibility of losing money, the possibility of being scammed is also there. Now mobile carries more money than a wallet in the pocket, which decreases the risk of a pickpocket. By using digital methods of payments, money can be sent and received instantly from anywhere in the globe. Online payment of electricity bills, online gas booking, online hotel booking, etc., have boosted the volume of digital transactions in recent years. The scholarships are directly shifted to the accounts of the students by the government through digital payment modes.

Digital payments have the potential to reduce corruption and eradicate black money from the country as they facilitate the smooth movement of funds. Such types of payments have the transparency of funds. Due to the transparency of funds, money is floating in the economy without any hoarding of money, and taxes are properly paid by the traders in India. Owing to the ease of online payments, an increasing number of people purchased goods and services online which increases the money flow in the economy and helps in the growth of the economy.

Conclusion

Digitalization of an economy has turned immensely inevitable in modern society. The digital and technological revolution has paved the way for innovative methods of payment worldwide. Demonetization has broken down the traditional barriers to digital payment adoption. The usage of cash as a payment mode is continuously declining. The use of digital payment services has led to an increase in online fraud and security offenses. The risk in digital transactions can be minimized by awareness. Customers will prefer more online transactions if they realize that digital payment modes are convenient and secure. The advancement of the economy is aided by a rise in money flow due to the adoption of digital payment techniques. The study emphasizes the adoption of adequate measures by E-payment providers for the protection of various kinds of cyber security menaces. The issue of digital literacy and insufficient information should be addressed to increase digital payments which are essential for the growth of the economy.

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