

DIGITAL PAYMENT ECOSYSTEM IN INDIA: A STUDY ON INTEROPERABILITY DURING THE COVID-19 CRISIS

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ABSTRACT

The Prime Minister's plan, the "Digital India Program," will spur innovation across all industries. The COVID-19 period increase the use of digital payment system because of the social distancing rules and lockdown situation. During COVID-19 period, there is a need to quickly transform traditional payment mode to digital payment mode. The world need to adapt new ways of life and work. Since 2016, government has made a concerted effort to promote online payments, beginning with demonetization. Many digital and Indian economic actions were motivated by "Digital India" campaign., unstructured support data (USSD), the Aadhaar Enabled Payment System (AEPS), integrated payments, Bank car bank prepaid cards, and other ways of digital payment are available in India. The COVID-19 pandemic has significantly accelerated the adoption of digital payment systems across India, highlighting the critical role of interoperability in the digital payment ecosystem. This research explores the interoperability of various digital payment platforms in India during the COVID-19 crisis, examining how seamless integration between different payment systems, such as Unified Payments Interface (UPI), mobile wallets, and traditional banking channels, contributed to the broader acceptance and usage of digital payments. The study investigates the role of government initiatives and policies in enhancing system compatibility. Through a combination of qualitative and quantitative data, the research highlights the lessons learned during the pandemic, provides insights into the strengths and weaknesses of India's digital payment infrastructure, and proposes recommendations for future improvements to ensure a more inclusive and efficient digital payment ecosystem. Here, we explore scenarios of increase in the amount of digital payment system pre and post COVID-19 period in India.

INTRODUCTION

Digital technologies have emerged as catalyst for citizen empowerment and rapid economic growth. Digital technology is increasingly used in daily life. Honourable Prime Minister aim to transform our country and providing opportunity for all citizen through the use of digital technologies.

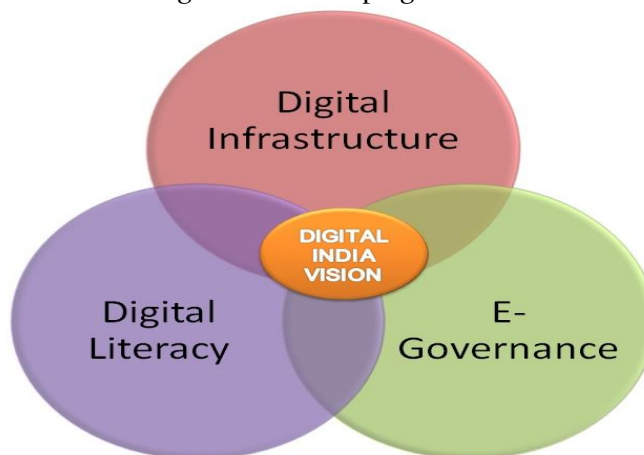
Digital payment system and E- money play a key role in the COVID-19 period. Digital currencies are used as a contact less money. So, during COVID-19, there are reports which stated that currencies contain COVID-19 virus and people try to avoid top form cash transaction. This situation will boost the digital transaction in India.

There two different phenomena related to digital technology helped to fight in the COVID-19 situation. Firstly, physical form of currencies were believed to be contain the virus and referred as "dirty money" and digital payment was preferred in place of banknotes and coins. (Gardner, 2020; Samantha, 2020).Online delivery services were motivates customers payments through different online payment applications, and it is also made compulsory in some states of India by the government (Bhandari, 2020).Second, there was a lot of people who lost their jobs in lockdown period and government provided help through different digital payment applications. So, digital payment applications are a very easy mode of transfer of funds during the crisis period.

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Vision of Digital India initiative

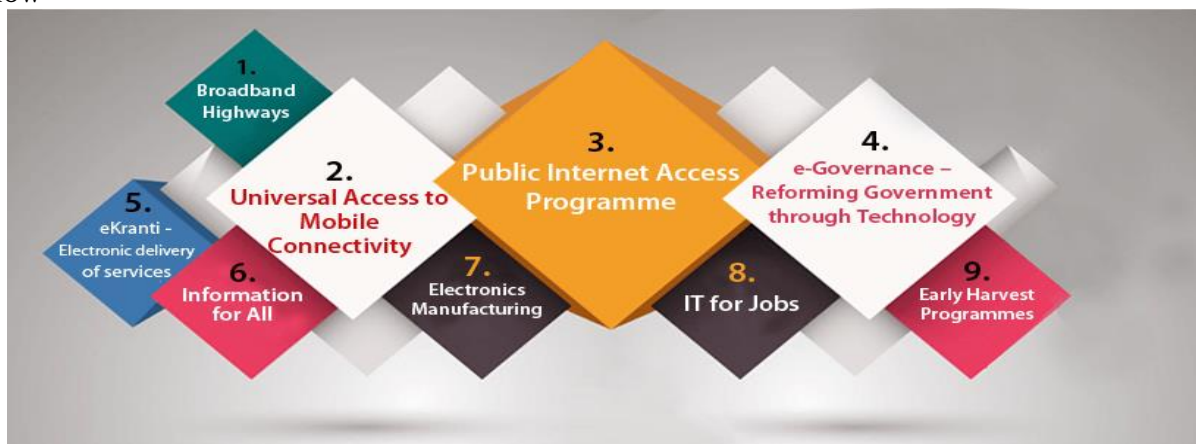
The three visions of digital India campaign are shown in the diagram:



- **Digital infrastructure**– In this vision, high speed internet is a main service. Public service will offer online. Safe and secure cyber space environment will be provided by government in the country.
- **E- Governance** –Under this vision, services of government will be available digitally through which people can easily access these services. Transactions can be performed online.
- **Digital Literacy** - This is an initiative of digital India programme to provide digital literacy to the people and provide digital services which can be easily accessible by common people.

Nine Pillars of Digital India Programme

Digital India programme consist of number of initiative,each of which aims to make India as a techno knowledge economy and provide better services to their citizens. Nine projects of digital India which are shown in the diagram given below-



1. **Broadband highways** - The starting phase is to create fibre optic high-speed broadband highways that include all the outlying locations, government agencies, academic institutions, and research and development centres, among other things. To access online content while on the go, web-based portals and mobile apps will be developed.
2. **Availability of mobile connectivity worldwide** - government trying to ensure that each villages linked through internet connectivity. The aim to make General public aware so that they will access the services of government on online basis.
3. **Public internet access programme** - Technologies that provide remote access to any data or service that is accessible throughout the domain and promote cost efficient, secure and social connectivity. Because of this change every citizen will now have access to e-services.
4. **E-Governance** – In this pillar, every manual work change into digital basis. It revolutionize the system in the following ways:

- Applications can be accessed online, and information available on digital basis.
 - Effortless assignment tracking.
 - React quickly, analyse issues, find solutions, and many more.
5. E- Kranti- In E-Kranti, all services related to education, health, rights etc will deliver on online basis on a very high speed bandwidth.
 6. Information for all- Aim of the government is provide data digitally and trying to connect social media platforms. Information is easily available for the citizens.
 7. Electronics manufacturing- With the help of digital technologies, the government is trying to achieve a large scale electronic manufacturing in India.
 8. IT for jobs-The government is trying to provide training and skills to the people to grab different opportunities in the IT sector. It include youth from village and towns.
 9. Early harvest programme- This programme will create IT platform for messages, educational books to e-books,e- srvcies for entertainment, weather information and biometric attendance etc.

Digital Payment

Digital payment is a payment method which is performed through digital modes. Both the payer and the receiver send and receive money through online modes while performing transactions. It is also known as electronic payment or E- payment. Digital payments are performed without the use of physical currency. Transactions and exchange of currencies are performed on online basis. It is a quick and easy process. **In India, more than 80 million adults made their first digital payment after the start of pandemic.**

Modes of Digital payment

- **Electronic clearing service (ECS)**- ECS was introduced by the RBI for easy transfer of massive transfers of cash between bank accounts. This method is used for funds which are both repetitive in nature. This method of fund transfer is usually used by large organisation for bulky transfers like salaries, fees, pensions, interests, dividendsetc.ECS includes transactions which are performed under “National Automated Clearing House (NACH) and it is operated by National Payments Corporation of India (NPCI)”
- **Immediate Payment Service (IMPS)**- Immediate Payment Service (IMPS) is a real time payment inter-bank electronic fund transfer system. This service can be performed by different channels, including mobile, internet, ATM, and SMS. With IMPS, money can be sent immediately between different banks all over India. The service can be assessed 24x7 throughout the year including bank holidays. It is secure and cost effective method of transaction. Around 200 million IMPS transaction happen every month in our country.
- **Real-time gross settlement (RTGS)**- RTGS was launched by the Reserve Bank of India (RBI) in 2004. This system which allow transfer of funds. Real-time underscores the nature of the transfer. without any delay or waiting period. It enables high amount of transactions. Minimum limit for RTGS is INR 2 Lakhs.
- **National Electronic Funds Transfer (NEFT)** – It is developed by RBI. It is a payments system which allows transfer of funds from one bank to another bank in India. NEFT has been made available for customer throughout the year (24x7), including bank holidays. As of 30 November 2019, 1,48,477 branches 216 banks provides NEFT facility in India.
- **Unified Payments Interface (UPI)**- UPI is a payment system which allows users to connect many account in a single application also perform IFSC codes and account numbers of account holders are not required for transactions. This is a instant payment system where transactions are performed instantly.. “As of February 2022, there were 358 banks available on the platform with a monthly volume of 6.7 billion transactions amounting to 11.16 lakh crore.” As of May 2021report, monthly active number of In India, there are more than 10 crore (100 million) UPI users.
- **BHIM** - For Aadhaar Enabled Payment System(AEPS), an Indian bank offers a mobile app called “BHIM Aadhaar-Indian Bank” on Google Play. Through Aadhaar authentication, it enables merchants to accept digital payments from customers.
- **National Automated Clearing House (NACH)**- NACH is used for high volume electronic transactions. With a motive to merge multiple Electronic Clearing Systems performed across the country and to provide harmonization of standard and practices, NACH was introduced.

- **Debit card-** debit card is a payment card that help making purchases online and in person by drawing money directly from bank account. Debit cards can also be used to withdraw money from ATMs. “The total number of cards in circulation in India breaks the 100 crore mark in 2021”.
- **Credit Card-** A credit card is a type of payment card that is given to users, or cardholders, to enable them to make purchases based on their accumulated debt. The card issuer opens an account that allow a customer credit, which they can use to borrow money for payment.

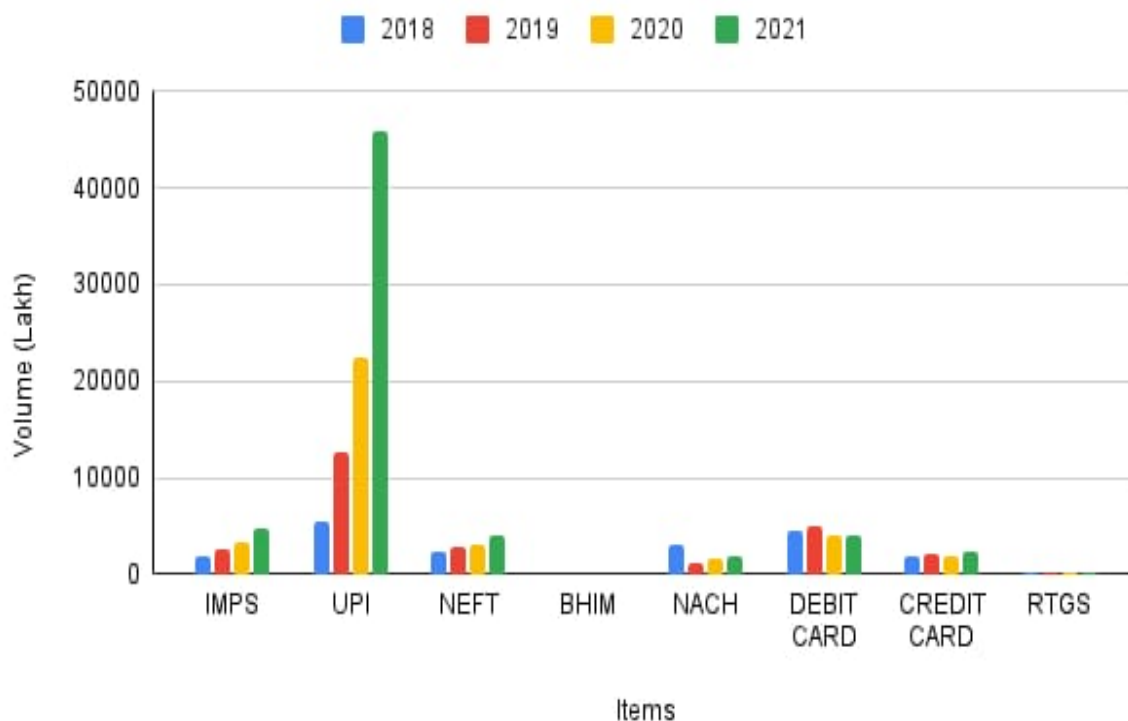
RESEARCH METHODOLOGY

This paper is based on secondary data in order to analyse “Digital Payment Ecosystem in India: A Study on Interoperability During the COVID-19 Crisis”. The data collected from secondary sources such as previously published articles, journals, RBI annual report and government published sources, .

This paper considered some table and graphs which shows trend of digital in India from financial year 2018 to financial year 2021.

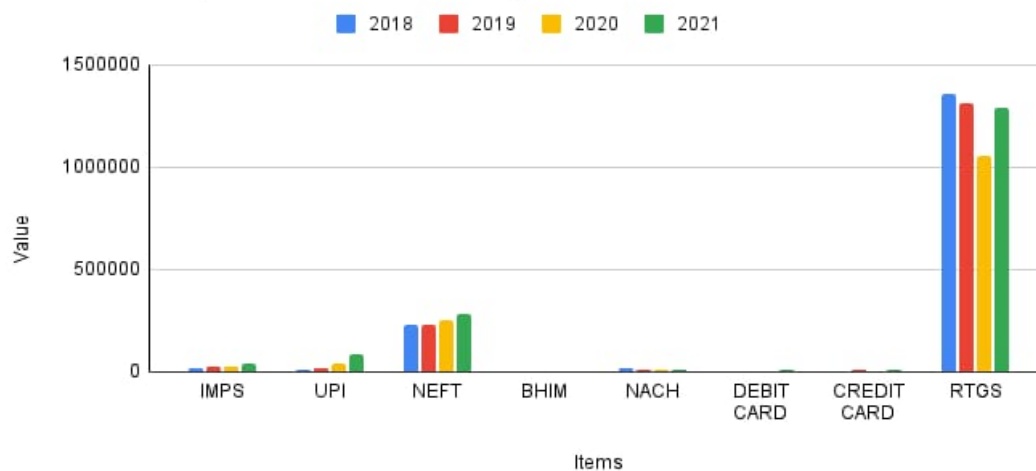
| ITEM | VOLUME (million) | | | | VALUE (billion) | | | |
|-------------|------------------|---------|---------|---------|-----------------|---------|---------|---------|
| | 2018 | 2019 | 2020 | 2021 | 2018 | 2019 | 2020 | 2021 |
| IMPS | 1752.9 | 2579.2 | 3278.3 | 4662.5 | 15903 | 23380 | 29410 | 41710 |
| UPI | 5353.4 | 12518.6 | 22330.7 | 45956.1 | 8770 | 21320 | 41040 | 84160 |
| NEFT | 2318.9 | 2744.5 | 3092.8 | 4040.7 | 227936 | 229460 | 251310 | 287250 |
| BHIM | | 9.1 | 16.1 | 22.8 | | 10 | 30 | 60 |
| NACH | 3035.2 | 1110 | 1646.5 | 1873 | 14762 | 10370 | 12170 | 12770 |
| DEBIT CARD | 4414.3 | 5061.1 | 4014.6 | 3938.7 | 5935 | 7040 | 6610 | 7300 |
| CREDIT CARD | 1762.6 | 2177.3 | 1764.1 | 2239.9 | 6033 | 7310 | 6300 | 9720 |
| RTGS | 136.6 | 150.7 | 159.2 | 207.8 | 1356882 | 1311560 | 1056000 | 1286580 |

Trend's in Digital Transaction (Volume)



Source – RBI

Trend's in Digital Transaction (Value)



Source – RBI

The figure shows use of various digital payments systems within India through NEFT, Credit card payments, IMPS, Debit card payments, NACH, UPI and RTGS for the year 2018 to 2021. The graph shows that the use of different digital payment service in financial year 2018-19 was very less but after passing year when Indian people started increasing their awareness about digital payment system, they start to perform their transaction through E- money and UPI. It can be seen that after COVID-19 pandemic in January 2020, there is a high increment in use of UPI transaction by 78% from the previous year 2019 which leads to continues growth in 2021 by 105%. Each digital payment system is showing a continuous growth every year but UPI is at the top of all which shows that people are started more using digital payment applications such as Google Pay, Paytm, and Phonepe and several others. It shows from the graph that the use of digital payment system after pandemic increased drastically, people find it very easy and convenient way of performing transaction on digital basis. So, COVID-19 has increase the users of digital transaction in India.

CHALLENGES IN ACHIEVING INTEROPERABILITY

Despite the progress in India's digital payment ecosystem, several challenges hinder full interoperability:

- **Technological Barriers:** User experience was negatively impacted by problems such system crashes, transaction failures, and lengthy processing times, particularly when there were problems with seamless platform integration. During periods of high usage, several mobile wallet apps had trouble syncing with UPI, which caused payment delays.
- **Security Concerns:** As digital transactions increased, so did cybersecurity risks, such as fraud, data breaches, and phishing schemes. In the early phases of the adoption of digital payments, these problems were made worse by the absence of effective regulatory procedures.
- **Rural-Urban Divide:** While digital payments were common in cities, the adoption of interoperable systems was hampered in rural areas due to issues like poor internet penetration, restricted smartphone access, and a lack of digital literacy.
- **Regulatory and Policy Challenges:** The Indian government launched a number of programs, including the Pradhan Mantri Jan Dhan Yojana and Digital India, to increase financial inclusion, but the complicated regulatory environment and inconsistent policy implementation hindered interoperability amongst various payment platforms.

CONCLUSION

Digital payments are a way to transmit and receive money in an economy, and they have a positive impact on growth since they make it easier for money to move. People can make their transactions anywhere in the world using digital payment software without having to empty their pockets first. Before the pandemic, Indians, including businessmen and households, used digital payment systems, but the Covid-19 wave dramatically enhanced the

usage of digital apps in the market Since the pandemic, every citizen is more concerned with their health and safety and prefers to use digital transactions rather than cash payments. Trading with digital apps is far safer than physically exchanging cash., which requires touching the notes with many hand. In addition, the National Payments Corporation of India (NPCI) has stimulate people to utilise digital payment methods to prevent them from leaving their homes, even to use an ATM, minimise social interaction, and stop the COVID-19 virus from spreading. The pandemic wave has encouraged consumers to utilise digital services more frequently even if there was a rise in usage after the demonetization event. The usage of digital will likely continue to increase, according to the existing trend. The growing Indian economy GDP and the standards of society, which were not previously much conscious or were experiencing trade-related problems by using cash alone in their daily lives, are both greatly influenced by digital payment applications.

RECOMMENDATIONS

The study's conclusions lead to the following suggestions to enhance interoperability in India's digital payment ecosystem:

- **Technological Integration:** Assure smooth platform-to-platform integration, paying particular attention to minimizing transaction failures and delays during periods of high demand.
- **Better Cybersecurity Measures:** To safeguard users from online fraud and cyberattacks, especially in rural regions, security standards should be strengthened.
- **Enhance Digital Literacy:** Encourage digital literacy initiatives to close the knowledge gap in underprivileged and rural areas, allowing for a wider uptake of digital payment methods.
- **Government Support for Rural Areas:** Put laws into place that particularly address the difficulties that rural communities experience, such as expanding smartphone and internet access.
- **Regulatory Alignment:** Make sure interoperability issues are resolved by streamlining regulatory frameworks to encourage increased cooperation amongst different payment platforms.

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