

# Research paper on Digital Payments in India

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**Abstract-**Propelled by recent policy initiatives and technological developments, India's digital payment system is a promising success story in the making. In recent decades, the country has seen a significant increase in the use of digital payments. A digital payment, also known as an electronic payment, is the transfer of value from one payment account to another using a digital device such as a mobile phone, POS, or computer, as well as a digital communication channel such as mobile wireless data or SWIFT. Mode of digital payment commonly used by the citizens of the country are bank transfers, mobile money, and payment cards i.e., credit, debit, and prepaid cards. Since the launch of IMPS by NPCI in 2010 until the release of UPI in 2016, the digital payment system has evolved several times. The study is an attempt to analyse how various forms of digital payment evolved in the past and how COVID-19 impacted the digital payment systems in India. The study concludes that digital payments in India recorded a robust growth of 26.2 per cent in terms of volume during 2020-21 on top of the expansion of 44.2 per cent in the previous year. Lastly, it has been observed that after COVID-19 pandemic, people were concerned about health regulations and were afraid of cash transactions which made them switch to this mode, resulting in a rise in the usage of different modes of digital payment systems.

**Keywords:** Digital Payment System, Pandemic, Cash Transactions, Cashless Economy

## INTRODUCTION

The consensus around the origin and the forms of ancient money has kept changing over the course of recorded history. But, what has not changed over the years is what money does; broadly, it facilitates trade in goods and services as medium of exchange and acts as a credible store of value. Modern day trade demands massive payments to be settled fast over long distances with minimum transaction cost. Evidently, to suit these needs the payment systems are being digitised globally. Cash, however, remains a crucial part of the trade. Therefore, the discourse on the current age

payment system revolves around cash vs digital transactions.

While cash might seem convenient as it's ingrained in our habits and is still readily accepted at more places, digital payments offer convenience by saving time and labour. There are further issues with cash use. While it provides a suitable alternative to aid the informal or parallel economy, digital payment offers itself as a desirable tool for institutions to fix this problem of traceability. In fact, governments around the world have taken drastic measures at huge costs to clear markets of 'black money'. Research in the behavioural sciences conveys that people experience higher 'pain of paying' when paying in cash than digitally, and this contributes to deferred payments. While cash may not seem to impose any direct transactional cost like digital money, it is still costly for both governments and end-users. A 2014 study found out that residents of Delhi spent around 6 million hours and ₹91 million to access cash, while the Reserve Bank of India (RBI) and commercial banks together spent about ₹210 billion towards currency related operating expenses in the same year. But on the other hand, there are also huge implicit costs to digitise the existing systems and nudge people to change.

In the last decade, India has rapidly digitised its payment systems and promises huge potential in the area. Digital payments recorded an increase of 46.5% in total volume in FY19 on top of an increase of 60.6% in FY18. The Unified Payments Interface (UPI), a payment system that was launched in 2016, has surpassed the milestone of a billion transactions per month. The progress in digitisation has been driven by a healthy mix of technological innovation, policy interventions, and expansion and strengthening of existing infrastructure on the supply side, coupled with an increasing proportion of the population adopting financial and digital instruments on the demand side. The government of India and the RBI have been working in synergy to push for policy and regulatory reforms. Enablers such as Jan Dhan accounts, Aadhaar

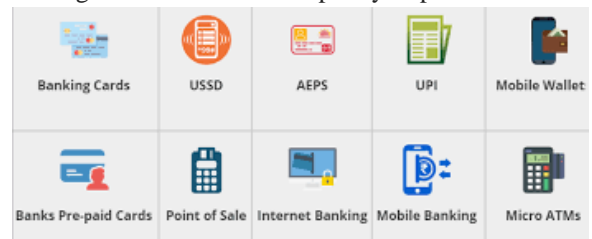
and penetration of mobiles, and policies like Demonetisation and Goods and Services Tax have brought people closer to technology and banks. Recently, NEFT (National Electronic Funds Transfer) was made operational for 24 h on all days of the week, and RTGS (Real Time Gross Settlement) is expected to follow soon. The launch of UPI, along with already available digital payment modes like NEFT, IMPS, cards and Prepaid Payment Instruments (PPIs) has increased the options available to the consumer. The number of PoS (point of sale) terminals have also increased by about 40 lakhs in the last five years. PoS terminals and lightweight acceptance infrastructure such as QR codes have boosted Card/PPI based payments. Additional payment systems such as Bharat Bill Payment System (BBPS), National Electronic Toll Collection (NETC) system, RuPay cards and AePS have also boosted digital payments and the intent to incorporate modern-day technologies such as tokenisation and contactless payments will further the progress.

Despite this progress, cash use still seems to be on the uptick in India. Our paper seeks to highlight the important factors at the individual level, which influence the consumer’s decisions to use cash or digital payment. While it is critical to push for technological innovations and policy reforms, it is also imperative to understand the aspects that motivate or hinder the adoption of these technologies by the end-user. A recent survey, on the readiness of consumers towards adoption of newer payment technologies, ranked India second out of 27 economies on the FinTech adoption Index. Research conducted at the individual consumer level can provide an insight to understand how certain aspects are at play while making a payment decision. To this end, we use a comprehensive and multidimensional online survey which addresses many hitherto untouched dimensions of this topic, such as the difference in digital spending over various expenditure categories (groceries, e-commerce, utility bills, etc.), the choice of consumers to go purely digital or exercise a mix of cash and digital options, and the effect of psychological factors like perception and trust.

There is a dearth of studies and data covering the behavioural aspects at individual level that have an impact on choice of payment behaviour in the Indian economy. Given the massive heterogeneity of our population, different samples might produce disparate

results. The High-Level Committee on Deepening Digital Payments recommended that there should be periodic surveys to gauge user experience and attitude towards digital payments. The present study, is a small step towards filling the research gap in the context of such analysis.

Our key findings point towards a significant impact of perception of the payment system on how people choose to pay. Not only does a positive perception motivate people to go ‘digital’, but a relatively negative outlook on cash also has a similar impact. This finding is important in light of increasing cash use at the macroeconomic level in the country. Another significant factor is confidence in the payment system. Respondents who trust the service providers and regulators seem to have a greater likelihood of paying digitally. We find inconsistent behaviour when studying the impact of experience of digital payment fraud on choice of payment tool. The impact that experiencing such a fraud has on the choice to pay digitally differs according to the purpose of the transaction. The remainder of the study is presented in five sections pertaining to existing literature, data and methodology, sample summary statistics, empirical findings and conclusion and policy implications.



### CONCEPTUAL FRAMEWORK

“Paperless and Cashless” is one of perceived role of Digital India. As part of promoting cashless dealings and converting India into cashless society, different modes of digital payments are existing. These modes are:

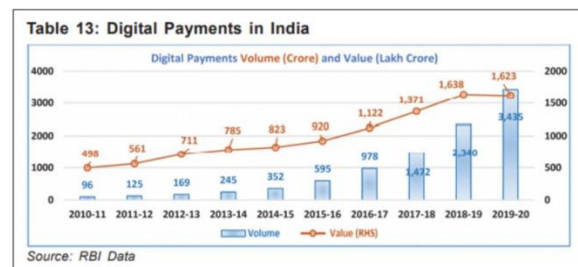
- Banking Cards (Debit / Credit / Cash / Travel / Others) Banking cards (debit / credit / cash travel / others): Banking cards offer consumers more safety, convenience, and organise than any other payment method. These cards provide 2 factor authentications for secure payments e.g. secure PIN and OTP. They save both customers and merchants’ time and money, and thus enable them for ease of transaction

- **Aadhaar Enabled Payment System (AEPS)** Aadhaar enabled payment system (AEPS): AEPS is a bank led model which allows online interoperable financial transaction at (Point of Sale / Micro ATM) through the Business Correspondent (BC)/Bank Mitra of any bank using the Aadhaar verification.
- **Unified Payments Interface (UPI)** Unified Payments Interface (UPI) is a system that powers manifold bank accounts into a single mobile application (of any participating bank), amalgamation a lot of banking features, seamless fund direction-finding & merchant payments into one top
- **Mobile Wallets** A mobile wallet is a way to take cash in digital format. You can link your credit card or debit card information in mobile device to mobile wallet application or you can transfer money online to mobile wallet. Most banks have their e-wallets and some private companies. e.g. Paytm, Freecharge, Mobikwik, Cred, Airtel Money, Jio Money, Phonepe, Google Pay etc.
- **Internet Banking** Internet banking, also known as online banking, e-banking or essential banking, is an electronic payment system that enables customers of a bank or other financial institution to ways a range of financial transactions through the financial institutions
- **Bharat Interface for Money (BHIM) App** Bharat Interface for Money (BHIM) app all digital cards and payments are applicable on Commercial institutions, Bank, Shopping Centre and many places.

### THE BENEFITS AND CHALLENGES FOR INDIA IN GOING CASHLESS

The benefits and challenges for India in going cashless  
 The recent move of demonetization has upset the dusty cages of cash based economy and strained the people to second thoughts the instant of transactions and trade. *The demonetization steer was initially termed as a instrument to deal with the problem of black money and fake currency, but since then, the account has clearly shifted base.* Now it is a way to encourage cashless transactions among citizens, which is actually a high-quality initiative for the country. But the question is whether India is ready for it or how realistic it would be for the government to revolve India into a cashless economy by 2020. India has a huge amount of black money. According to currently estimates around 1/4th of Indian GDP is the outline economy of India,

which is like a equivalent measurement slowly sucking out energy and matter from our measurement (economic ecosystem). However, one thing needs to be made clear that of all the black money in India only 10% of it is in horded cash and the rest is in floating in the market or is in form of gold, stocks or real estate. The success or failure of demonetisation as a means to control black money and fake currency can only be determined after a couple of months but the fact that digital economy is good for the country, is overpoweringly accepted as true. What you want to recognize is, how it can be helpful for our country and what are the challenges in front of India in going cashless.



Government of India is committed to expand digital transactions in the Indian economy, and thereby enhance the quality and strength of the financial sector, as well as ease of living for citizens. Digital payment transactions have significantly increased as a result of coordinated efforts of the Government as a whole, along with all stake holders concerned, from 2,071 crore transactions in FY 2017-18 to 8,840 crore transactions in FY 2021-22 (Source: RBI, NPCI and banks).

During last five years, various easy and convenient modes of digital payments, including Bharat Interface for Money-Unified Payments Interface (BHIM-UPI), Immediate Payment Service (IMPS), and National Electronic Toll Collection (NETC) have registered substantial growth and have transformed digital payment ecosystem by increasing person-to-person (P2P) as well as person-to-merchant (P2M) payments. BHIM UPI has emerged as the preferred payment mode of the citizens and has recorded 803.6 crore digital payment transactions with the value of ₹ 12.98 lakh crore in January 2023.

The push for digital payments was one of the stated intentions of demonetisation. There was an immediate and sharp jump in digital payments in November–December 2016 owing to shortages of cash. The debit card point of sales transactions was twice the size of

value suggested by trends before demonetisation. The value of credit cards increased but no sharp growth was seen. The mobile wallet transactions picked up immediately after demonetisation, followed by a dip in mid-2017 due to easing cash shortages. There was again sharp rise thereafter. By April 2018, the volume of the digital payments had doubled. After return of the cash, the growth in digital payment had been modest.

The currency-to-GDP ratio was 12.1% in 2015–16. It declined to 8.8% in 2016–17 due to demonetisation but increased again to 10.9% in 2017–18. The currency-to-GDP ratio was only marginally lower compared to levels before demonetisation.

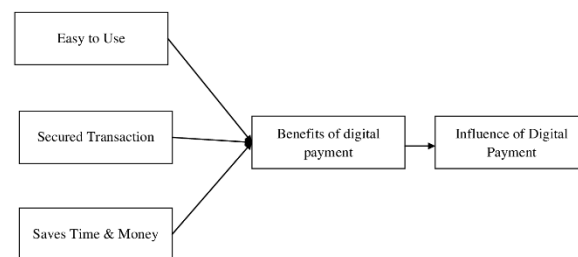
### LITERATURE REVIEW

India is the second-largest smartphone market in the world after China. The smartphones and other facilities with strong back up of Internet providers like Reliance Jio have boosted usage of the digital wallets, electronic payments. Mobile connectivity and internet are very important for online payments. As of November 2019, the active internet users in India are 504 million (Digital in India 2019 by IAMAI and Nielsen). Financial service institutions and other firms have tried a lot in increasing online payments and governments have also increased efforts to make increased penetration of internet. The penetration in rural India is also increasing substantially). The digital payment market is estimated to be \$ 69,168 million in 2020(statistica.com). This is contributed by the technological developments happening in this field and emergence of digital wallets. Digital wallet is a software application that helps users to digitally store money, payment credentials, and more. Consumers can use this software to implement various types of cashless transactions (McKinsey, May 2015). This is very much used for digital payment. The major deterrent for India ‘s growth in this sector is the reach and quality of internet. India was ranked 128 out of 140 countries in terms of internet download speed as per the research done by The Hindu (December 2019). This must be improved for digital payment to be more successful. Though digital payment has reduced in different key sectors affected by COVID19, a lot of other sectors have seen an increase of utilisation like online retail stores, gaming industry, utility payment etc (PWC Report, 2020). Usage of mobile payment has

increased over the years for payment. Indians are moving from cash to cashless economy slowly.

The country needs to move away from cash-based towards a cashless (electronic) payment system. A cashless economy will help reducing currency management costs, track transactions, check tax avoidance / fraud etc. A high percentage of respondents like to pay through either cash or debit card, the two of which are closely placed in terms of their preferences, at 66% and 67%, respectively, and this behaviour could pose a serious challenge to players in the digital payment industry. A cashless society is influenced by lot of parameters. The government has a role to play to help customers adapt to cashless transactions. Especially this is true in the wake of the pandemic in the world. In India, one of the primary factors is the impact of government on consumers towards cashless transactions. Both private and public banks also promote and help their customers towards cashless transactions by offering mobile banking and net banking facilities. Consumers can monitor, transact, make payments, recharge, booking, etc., done with the help of mobile wallets. Different deals, discounts provided, the cashback and other kinds of incentives help in attracting consumers to transactions without using cash.

### Conceptual Framework



### Tips to follow while making online payments

- Do not save card details: Most of us prefer to save our card details on our smartphones or other devices to avoid entering them every single time. But this is not advisable as it can be used for wrong purposes in cases of theft. Always make sure to erase your card details after every use.
- Never share your passwords: As cliché as it sounds, it is very important to follow this advice. Don't share your passwords with anyone, and keep changing them regularly so that you don't fall prey to hackers or any other cyber criminals. Have a strong password and enable the OTP feature to ensure maximum security.

- Avoid using public Wi-Fi networks: No matter how much of a hurry you are in, you must always avoid making transactions via public computers or WIFI networks as there are high chances of data theft and other cyber-attacks.
- Use private windows: Make sure you perform all your transactions on private windows and avoid all kinds of suspicious apps or websites that are not recommended by the app store. You can find out about such apps by looking for reviews and the number of downloads.

## ADVANTAGES OF ONLINE PAYMENTS

### 1. Speed of transactions

For both the seller and the customer, online payments save a lot of time. People don't have to wait in lines, take time to write checks, or wait for paper bills. They don't have to wait for banks to clear their checks so that they can access the money.

For sellers, it saves a great deal of time since they don't have to waste time printing and mailing bills. Online payments also decrease the chances of late payments. Since it takes less than a few minutes to complete a transaction, people will not forget it or put it off for later.

### 2. Convenience

People can pay for goods and services at any time of the day from any part of the world. It is easier to click a feature on your smartphone than to collect the correct amount of cash for your purchase. You don't have to carry a lot of cash, get worried about theft or not having perfect change. With online payment options, you just need to remember a certain pin, and that's it, your transaction is done! As simple as that.

### 3. Reaching global audience

One of the biggest advantages of having online payment gateways is that businesses can operate globally and have a customer base irrespective of geographical limitations. According to research, over 56% of online shoppers prefer to shop cross-border. So implementing online payment options on your e-commerce site will undoubtedly increase sales as you will be catering for a global audience.

### 4. Low transaction costs

In a traditional payment setup, businesses have to hire front-desk employees or cashiers to manage sales and payments. But with online payments, transactions take place in an automated environment. Merchants can set

up online payment gateways with minimal investment and lower transaction costs.

### 5. Quick and easy setup

Instead of spending time on setting up a whole payment process that involves certain equipment and some extra employees, you can easily and quickly integrate online payment gateways for your business. However, before you choose the services of a particular vendor, you can evaluate the different options available in order to choose the best one.

### 6. Variety of payment choices

With online payment features, you can offer your customers a wide variety of payment options to choose from. People have their own preferences, and if they can find that option while purchasing from you, there are obviously more chances of them actually getting through with the transaction.

### 7. Availability of more distribution channels

As a business, having online payment options can benefit your distribution channels a lot. If you are ready to accept online payments, you can enter the affiliate domain and branch out your sales by displaying your products or services on other websites. It is a great way to increase sales.

### 8. Easy management

Online payments make it easier to manage and store your money and other financial data. For both vendors and customers, there are a lot of tools available on the internet that will help you with transactions. You don't have to keep track of your finances and let the tools do the job. It only gets easier since you don't have to carry cash or cards.

### 9. Better customer experience

If customers feel it is convenient to purchase from you while also being able to save money and time, then that automatically translates to a positive customer experience. And as a business, you must put customer experience above everything else. Implementing online payment options for your business is a great way to achieve it, as many people nowadays prefer online payments over cash or card transactions.

### 10. Recurring payment capabilities

Online payments have made subscription markets operate with ease. Earlier, people used to make cash/card payments at regular intervals. Now, payments are automated and people don't have to actually remember to pay or take the effort to go all the way to the physical place of business to make their



payments. This has made receiving and accepting payments easier for both the seller and the customer.

#### DISADVANTAGES OF ONLINE PAYMENTS

##### 1. Technical problems

Online payments are subject to technical failures or downtime, just like any other software that is dependent on technology. Though tech maintenance operations are announced in advance and usually take place during the night, sometimes, it can cause frustration among online shoppers. Especially when it takes place without prior warning, a lot of businesses experience heavy bounce rates.

##### 2. Password threats

If you are a registered user with a website who uses online payments pretty often, there are high chances that the online portal can have access to your personal information or bank account details. Though most transactions use OTPs (one-time passwords), the need for password protection arises in such situations. Especially if you are someone who deals with different banks, you might face the risk of a privacy breach.

##### 3. Cost of fraud

Just as more and more people are shifting to online payments and preferring them over other traditional forms of payment, so are cybercriminals. ID thefts, phishing attacks, and database exploits are becoming more common. In order to prevent these and increase security, businesses install a lot of payment-security software and eventually incur a lot of costs.

##### 4. Security Concerns

As discussed in the previous point, using online payments come with a lot of security risks. Without proper security measures, fraudsters can easily hack important financial information and data. And since there aren't any verification systems like facial recognition or biometrics, criminals can easily get away without getting caught.

##### 5. Technological illiteracy

One of the main disadvantages of online payments is the technological illiteracy among many people, especially the older generation. Since they don't have enough knowledge on how to go about using technology or smartphones, they refrain from using online payment methods. A lot of them also fear the complexities of it and continue to use traditional methods of payment. This is a huge drawback in developing countries like India.

##### 6. Limitations on amount and time

Some banks limit the number of transactions you can do in a day or the maximum amount you can transfer in a day. Most online transactions also have a time limit under which you need to complete the process (like receiving and accepting OTPs). All these limitations can prove to be pretty inconvenient to some users.

##### 7. Service fees and other additional costs

While implementing online payment gateways, some services may demand setup costs or even processing fees for customers using those facilities. Setting up online payment options obviously requires access to the internet and other services that come along with it. This easily leads to incurring extra costs and both the sellers and customers can find it tiresome.

##### 8. Disputed transactions

If you find someone using your electronic money, you can file a complaint with your bank or online payment processor. However, if you are unable to find the personal details of the person or for that matter, any details about them, then you cannot file a complaint or receive a refund. It gets tricky in such situations.

##### 9. Loss of smart cards

Most online payments are done with the help of credit/debit cards, ATM cards, or identity cards. So if you lose any of these, automatically, your online payment accounts that are linked to your cards will be at risk too. Of course, you can block your cards after informing the bank, but the time between losing your card and blocking it may prove to be risky as many transactions by fraudsters can take place during that time period.

##### 10. False identity

Unlike physical transactions, there are no ways to identify if the person making the online payment is the one he/she is claiming to be. Since there are no verification methods like photographs or signatures, most online payments are done behind a veil of anonymity. This can lead to a considerable amount of forgery and identity theft.

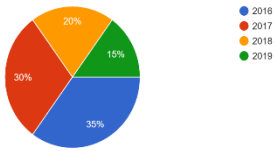
#### RESEARCH METHODOLOGY

In this type of research used in this paper through google forms which is framed by 18 questions on Real Time Basis.

Data analysis and interpretation

1.

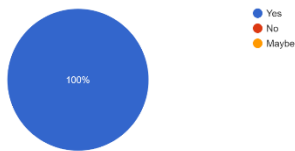
When did you know about digital payments in India?  
20 responses



The first query suggests that after demonetization, the people knew that digital payments will take a vital role in the year 2016. 35% of the survey people knew that technology in the payment system will occur in the future.

2.

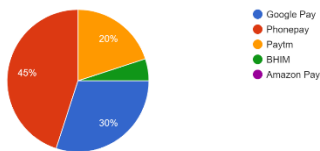
Do you have a smart phone?  
20 responses



In today's world there is no person without smartphone. Rather than the survey we can see that 98% of the population use smartphone and online payments.

3.

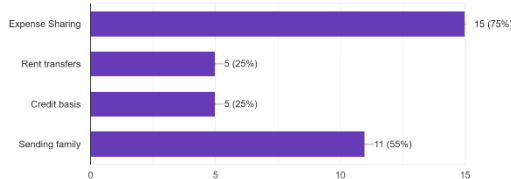
What's your preferred payment app for transferring money among peers?  
20 responses



The online platform for digital payments is of PHONEPE. Nearly 45% of the people use phonepe. The least platform app is BHIM consisting of 5% of the survey.

4.

What's your intent to transfer money among your peers?  
20 responses

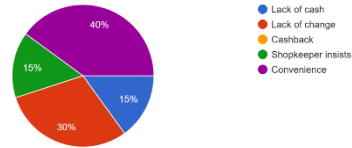


The most online payment / transfer of money is done for expense sharing i.e. 75%. Meanwhile rent and credit basis carries 25% of the survey. Apparently, the

digital payment like amount transfer is done for sending money to peers / family.

5.

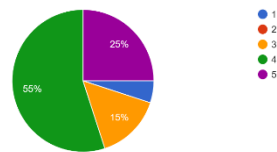
What nudges you to make an offline payment?  
20 responses



In this type of question, the offline payment is done due to convenience of the customer which is 40%. Most of the shops insists to do the online payment which is safer and transferred directly to bank accounts. People do the online payment in the lack of change too.

6.

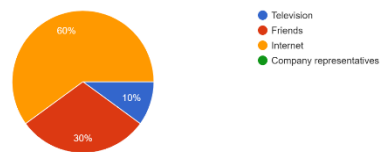
On a scale of 1 to 5 (1= low, 5= high/same level of acceptance as cash), how much are UPI payment methods accepted by merchants?  
20 responses



Nearly 55% of the people rated 5 out of 5 for accepting UPI payments by the merchant. In today's era, the UPI payments has taken a crucial role in accepting the cash through digital technologies.

7.

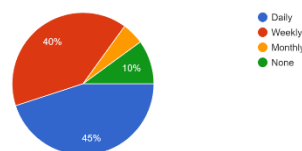
Which medium introduced you to mobile wallets?  
20 responses



The internet has taken a medium to introduce the mobile wallets of digital payments such as phonepe, paytm, google pay etc. The advertisements also show their how the mobile wallets are easy and speed in the transaction.

8.

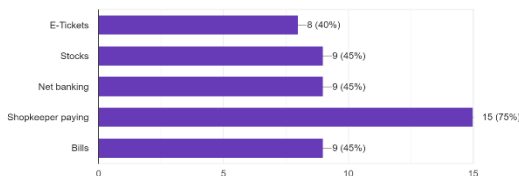
How often you do online transactions or payments?  
20 responses



The survey says that, the online transaction is taken up on daily basis. It is rarely used in a month. Nowadays we can see that individual does the online payment on regular basis.

9.

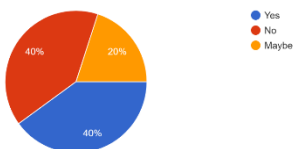
Why you use Online transaction?  
20 responses



Not only transferring money to shopkeepers, the online payments can be done in many ways such as E-Tickets, stocks, bills, banking etc.

10.

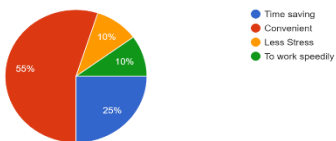
Is any time you had a bad experience with online transaction?  
20 responses



In this question, we can see the bad experience while using online transaction. Sometimes the internet might get affected due to its maintenance or bug issues. But now we can say that all the online platforms for payments have secured the gateway of payments.

11.

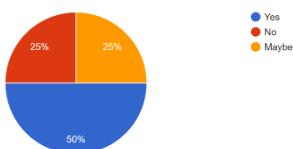
For what reasons you generally doing online transaction?  
20 responses



In this graph we can see that 55% of the online transaction is done because it's convenient and as well time saving. Besides it works with less stress of receiving or paying through hard cash transaction.

12.

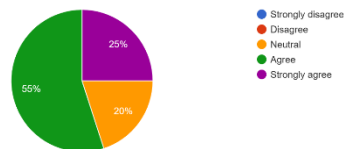
Sometime some hidden charges are there when doing online transaction .Is that affects your online Purchasing next time?  
20 responses



Based on the study, there is hidden charges which might deduct at the end of the month or yearly as maintenance charges. Even though if we install UPI apps there is a hidden charge which is minimum amount which deducts annually.

13.

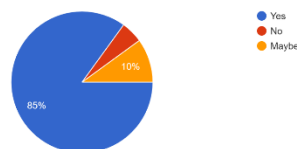
Is digital payment in India playing a vital role in development of the country?  
20 responses



Yes. Digital payments are taking a crucial role in the mode of transaction as it boosts to cashless economy and development of the country as well.

14.

Do you agree on future is up on digitalized payment system or currency?  
20 responses



Not only the survey, in real time basis the future is totally based on digital payments or currency. Meanwhile, other countries like France, Singapore, Bhutan, UAE etc have taken up the initiative of digital payments.

### FINDINGS

- In 2017, UPI recorded a YoY growth of 900%, processing over 100 million transactions worth INR 67 billion.
- In 2018, the YoY growth was 246% with transactions worth over INR 1.5 trillion processed.
- In 2019, the YoY growth was 67% with transactions worth over INR 2.9 trillion processed.
- In 2020, UPI recorded an YoY growth of 63% with transactions worth over INR 4.3 trillion processed in December 2020.
- In 2021, the YoY growth was 72% with over 1.49 billion transactions worth INR 5.6 trillion processed in June 2021[5].
- At the end of the calendar year 2022, UPI's total transaction value stood at INR 125.95 trillion, up



1.75 X year-on-year (YoY), as per the NPCI. Interestingly, the total UPI transaction value accounted for nearly 86% of India's GDP in FY22[8].

- At the end of the calendar year 2023, UPI's total transaction volume stands on 83.75 Billion.

### CONCLUSION

The growth of digital ecosystem in India has been driven by a number of factors, including the government's push towards digitalization, an increase in internet and smartphone penetration, and the rise of e-commerce. The Indian government has been actively promoting the use of digital technologies through various initiatives such as Digital India, Make in India, and Start-up India. These initiatives aim to increase the use of digital technologies in various sectors such as healthcare, education, and agriculture, and also to create a conducive environment for start-ups to flourish. The increase in internet and smartphone penetration in India has also played a major role in the growth of the digital ecosystem. According to a report by the Internet and Mobile Association of India, the number of internet users in India is expected to reach 800 million by 2023. This increase in internet users has also led to an increase in the number of mobile wallet users in India, which is expected to reach 900 million by 2025. The digital payments ecosystem in India has also grown significantly in recent years, driven by a combination of government initiatives, an increase in internet and smartphone usage, and the rise of e-commerce. One of the key initiatives is the launch of the Unified Payments Interface (UPI), which allows for real-time inter-bank transactions, and the Bharat Interface for Money (BHIM) app, which simplifies the process of making digital transactions.

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