

# Digital Currency in India: Challenges and Prospects

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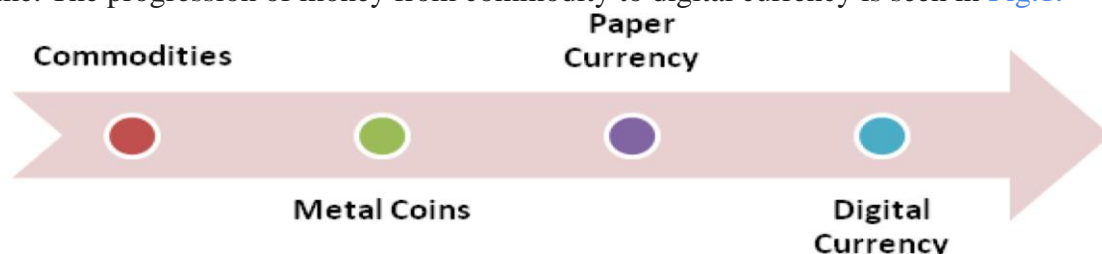
## Abstract

The digital rupee, also known as the e-Rupee (₹), was recently the subject of the nation's first pilot project by the Reserve Bank of India (RBI). An important step forward in the "Digital India" revolution has been made with the introduction of the digital rupee. India stands to gain much from this since it might facilitate business dealings and improve the overall security and robustness of the payments system. In an effort to disrupt physical money, reduce the cost of financial transactions, and alter the way money circulates, digital currency seeks to quickly advance monetary policy. It is crucial to do in-depth study on digital money and its consequences at the operational stage, even though the effects cannot be predicted. There are certain difficulties in creating an infrastructure for digital currencies in terms of scalability, performance, and various use cases. What e₹ is explained in the article. How does it operate? What distinguishes it from virtual currencies? What are the main obstacles and opportunities in India?

**Keywords:** Central bank digital currency, CBDC, Cryptocurrency, monetary policy, digital payment, cash, E-rupee.

## 1. Introduction

The evolution of the economy and payment system has had an impact on the form and functions of money across time. The progression of money from commodity to digital currency is seen in [Fig.1](#).



**Fig.1. The evolution of payment system**

India has advanced the innovation of digital payments remarkably. The idea of digital currency is not new. We currently use digital payment systems like Immediate Payment Service (IMPS), National Electronic Funds Transfer (NEFT), and Real Time Gross Settlement (RTGS) for our routine payments. They are available around-the-clock, safe, and efficient. The country's economic system has recently been significantly impacted by the revolutionary payment system known as UPI (Unified Payments Service), which has also become a model for other countries aiming to create a scalable, practical, and real-time payment system. All digital payment systems aim to provide customers with an alternative means of making physical cash payments. A decentralised system using encryption is used to verify transactions

and maintain records for digital currency known as cryptocurrency. The blockchain is cryptocurrency's showrunner. It is a distributed ledger that distributes access to authorised users while tracking transactions. As a whole, cryptocurrencies refer to the thousands of distinct digital currencies that now exist. Bitcoin is the most well-known illustration of a completely decentralised, peer-to-peer cryptocurrency. The 2009 launch of Bitcoin continues to be popular among miners and speculators. It started the cryptocurrency "revolution" that gave rise to several well-known coins, such as Tether, XRP, Ethereum, and Litecoin. For several reasons, India was against the adoption of Bitcoin and other cryptocurrencies. The government's worries about the possibility of money laundering and financing illicit activities through the use of these digital assets is one of the causes. The Reserve Bank of India (RBI) has no authority over cryptocurrency transactions. Another rationale is that the adoption of cryptocurrencies may result in a decrease in the market for conventional fiat currencies, such as the Indian rupee, so potentially harming the nation's economy. Concerns have also been raised over the market's lack of regulatory oversight and the volatility of cryptocurrency pricing. In April 2018, people were made aware that cryptocurrencies are not recognized as legitimate forms of payment in India. A bill banning cryptocurrency mining, ownership, sales, issuance, transfers, and use in India was developed by the finance ministry in 2019. If proven guilty of breaking the law, a person could get a steep fine or spend up to 10 years in prison. But in March 2020, the Indian Supreme Court lifted the prohibition. Then, in the Union Budget 2022–2023, the finance ministry said that cryptocurrencies will be subject to a 30% tax in addition to the introduction of India's own CBDC, dubbed the digital rupee. On December 1, 2022, the Reserve Bank of India (RBI) introduced the nation's first digital currency pilot project, called e₹ (e-Rupee). The Reserve Bank of India will back e-Rupee, a digital counterpart of the Indian Rupee that is a central bank digital currency (CBDC). The misunderstanding around the creation of a new CBDC may raise concern in the bitcoin community. Cryptocurrencies were developed with the goal of eliminating the middleman and creating a trust framework that is not dependent on any one institution. RBI would once more be the source of support for the e-Rupee, which is only the digital equivalent of fiat currency. It's feasible that a banking app or digital wallet would allow users to use the e-Rupee. With the digital rupee offering a safe and practical payment option, it may be possible to lessen the dependency on currency. A lot of things will determine e-Rupee's success, including user adoption, merchant approval, government support, and public trust. It would most likely have to apply the required fixes while accounting for a range of technological, legal, and regulatory issues.

## 2. Conceptual Framework

### Definition of CBDC:

Central bank digital currency is issued by central banks, it is a digital payment mode of transactions. It is a fiat digital currency, a liability of the bank. CBDC are defined by people in different perspectives; Shri T Rabi Sankar (2021) in a speech explained that CBDC is a digital form of money controlled by central banks that is the same as fiat currency. Bitter (2020) is interest bearing, account based, digital payment that is easily accessible by the public. Ozili (2021) defined CBDC is issued by the central bank which is a fiat digital currency. Kumhof and Noone (2018) CBDC is an electronic mode of transaction that is easily accessible, provides greater function for retailers, and a better operational structure as compared to any other forms by central banks.

### Based on users, CBDC are characterised into two types:

#### Retail CBDC:

It is distributed ledger transaction (DLT), that is directly issued to the public users which more feasible,

available for 24\*7, traceability.

Wholesale CBDC:

It is called as a financial institution that carries reserve deposit with central banks, which helps to reduce risks, improves payment & security settlements

### 3. Review Of Literature

(Priyadarshini, 2022) Central bank digital currency (CBDCs) started emerging in almost all the countries. This paper shows the history of CBDCs implemented in different parts of the world. The benefits and challenges of using the CBDCs in monetary policy are explained. The benefits and challenges of CBDCs in developing nations and India are shown in detail. It brings a conclusion that the digital budget is based on blockchain and other technologies. It brings detail on whether RBI has the legal right to implement CBDCs. To introduce in India, the major steps taken for digitalization and challenges to be faced are taken in this paper.

(Pradi, 2022) It shows the details of benefits, significance of CBDCs. The two broad users of CBDCs are explained and the MSMEs that help with it. The challenges faced by MSMEs are written. The methodology used in secondary data. Implementing CBDCs will become a reality and boost the economy.

(2022) It shows a detailed conceptual framework and the motivations of CBDC. Whether it can be token based or account based. Summaries of design features, instrument designs. The policy implications of introducing the CBDC in the economy. The technological factors are discussed.

(Monika Piasezzi, 2022) CBDC is a new system that is introduced in the market between the depositary and credit lines. When any of the systems used affects the either credit lines or depositary banks. It explains the benefits and scope of implementing CBDCs in future and the statistical analysis is also explained. The difference between the Transaction and payment department and the CBDC are explained. Challenges like household problems, financial frictions are shown.

(Bibhu Dash, 2022) It explains that implementing CBDC is necessary and gives more opportunity in India. It helps to work better than the cash as there are many struggles due to corruptions, fraud. It explains that as the technology is developing in the upcoming years, the change in banking and traditional systems. The need and challenges of smart banking and digital currencies in India. The term blockchain and cryptocurrency are briefed. The covid19 has led to major changes in many areas and the same in the crypto that further lead to development of cryptos in many countries like China, Venezuela etc.

(Barren Eichengreen, 2022) It gives information on CBDC and the cases for and against. It shows the statistical analysis of the electronic payment in India, banking stats for India. This paper concludes that implementing CBDC is not a good idea as it doesn't make stable changes.

(Selcen Ozturkcan, 2022) This paper explains about money and its main functions like money of exchange, store value, accounting unit. The covid19 was a pandemic that gave CBDC more potential. The difference between CBDC, crypto and stable coin. The research methodology used is twitter, the number of tweets based on the analysis it concludes that the government can introduce CBDC as neutral sentiment is more compared to positive and negative sentiment.

(Bordo, 2021) CBDC helps in the improvement of monetary policy. As technology improves from decades, the form of money also gets developed. It explains the history of money and its evolution from centuries. The data used is secondary data. It explains the advantages of using CBDC in a country and the lessons from the historical perspective.

(Pan, 2022) CBDC is issued by the central bank. The forms and types of CBDCs are explained. The

qualitative analysis of the different countries using CBDC in detail and the risks of implementing it. How it has evolved from barter to digital economy and its feasibility. The three major types of issuing CBDC: hybrid, indirect, direct CBDC. Though it is different from banking, it requires legal provisions. Explanation on can CBDC be implemented in India? It can be implemented as India is already using digital payment modes and it can reduce the cost of cash printings etc.

(Bhowmik, 2021) the digital payment and transaction in India and banking literacy are listed in this paper. The advantages of using CBDC are explained. The implication in India and discussion on the wholesale or retail CBDC is better? Though there are disadvantages like our country's banking is unstable and the corruption isn't reduced but apart from that the huge use of digital payment is favourable to introduce CBDC in India.

(Bindseil, 2022) This paper is based on secondary data and discusses the pros and cons of CBDC that was debated in 2021. Though this debate was since 2016 it had not brought a clear conclusion. In disadvantage it is divided into two forms: fear and dismissive. It concludes that both the digital form of payment and the money system should be handled hand in hand. As more and more users are increasing in digital payment and some users still prefer bank notes.

(Mr. Shivam Tripathi, 2022) States the need of issuing CBDC in India and the analysis of past behaviour. The comparison between the CBDC and the cryptocurrency is explained from people's point of view. It is based on theoretical analysis. It gives the suggestion of opting CBDC and concludes that CBDC is not an easy task, but gives a futuristic value.

(Agur, 2018) It stated the different types of CBDC like the wholesale CBDC, retail CBDC and the recent developments like the electronic devices and the peer-to-peer transactions. The pros and cons of retail CBDC. It provides the open questions based on introducing this system and a summary of the whole content.

(Gouveia, 2018) This paper states the features and variants of CBDCs. It lists the pros and cons of the topic. When CBDC is set up by the central banks, the evolution of the balance sheet differs in two ways: based on the asset and liability. It also brings out an explanation on fiat money, stable coin, cryptocurrencies, and the discretionary policies. It concludes that cryptocurrency is one of reasons to introduce CBDC, it doesn't create a threat for cash but brings out an easy feasibility, to either issue token or account based CBDC and the solution to this topic is endless and research still continues.

(Panetta, 2018) This paper analyses the pros and cons of CBDC: the risk and benefits, impact on the economy, as a digital cash. Some open issues like the traceability of digital currency, could it be remunerated, there are many cases on introducing the CBDCs, this paper concludes that it brings out the benefits of introducing CBDC and the research is still working on this topic.

(Ozili, 2022) this paper states the advances in CBDC. This is based on secondary data which explains about the countries that researched and experimented with CBDC and their motivational benefits. It brings out the future to be based on the evidence of impact of CBDC and how central banks can overcome it. It gives detailed information on the features of CBDC and its implication.

#### **4. Research Methodology**

The research methodology used for this research paper is an inductive approach. It is a quantitative approach as the main objective of the paper is realised in advance. It brings out a statistical analysis to understand the topic better. Data analysis is mostly based on secondary data provided by the selected

members who published their research. Websites used are google search, Jstor, Researchgate. To understand the pros and cons of CBDC, the data collected are simplified.

## 5. Objectives

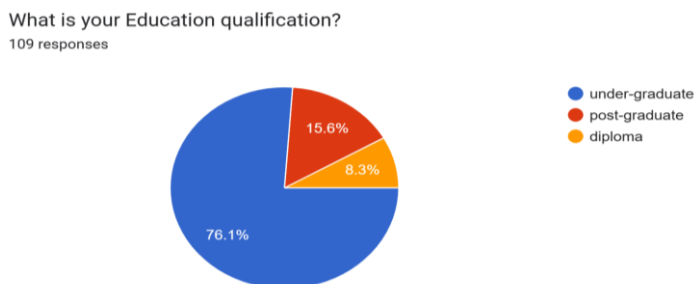
- To Understand How eRupee will work
- To Understand the awareness of CBDC among the Public in India
- Challenges Faced by Digital Currency
- To Understand Prospects of eRupee

### 5.1. How will eRupee work

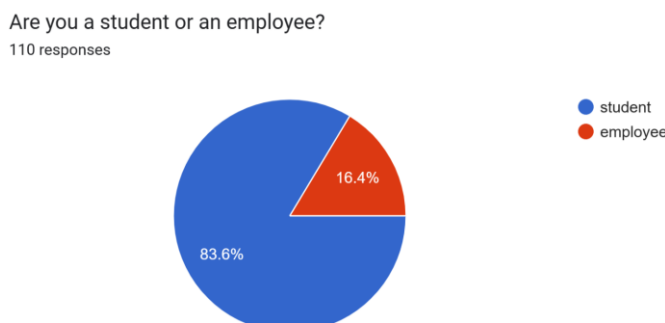
The goal of e₹, also known as the digital Rupee or e-Rupee, is to offer a straightforward, safe, and practical payment method that is accessible to all facets of society, even those without access to regular financial services. E-wallet adoption is anticipated to decrease with the support of e-payments. A lot of people think that India's own cryptocurrency is called e₹. But cryptocurrencies and the e-Rupee are not precisely the same. The digital Rupee could be used in the same ways as real cash, just like other CBDCs. It would function as a digital equivalent of cash. Like conventional fiat currencies, it would be meant to be used as a store of value and a medium of exchange. The intermediary banks will distribute the e-Rupee in the same denominations as coins and paper money. Customers can buy digital Rupee via the website, the official app, or the banks that have been designated. It is crucial to remember that the digital Rupee is still in its early stages and that little is known about how it will operate. e-Rupee can be implemented in two different ways: account-based e-Rupee and token-based e-Rupee.

### 5.2. The Awareness of CBDC among the Public in India

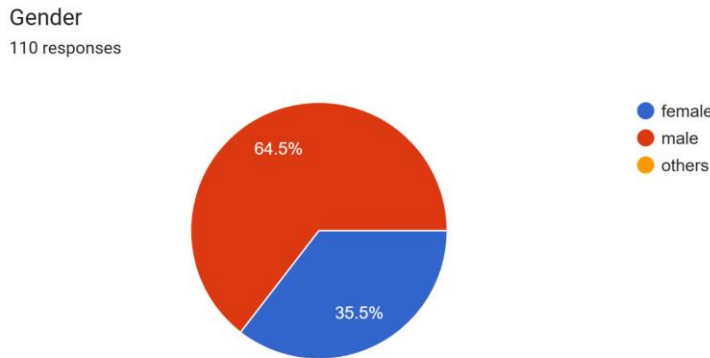
To understand the awareness of CBDC among the public in India, a questionnaire survey was conducted. The survey was taken with the strength of 110 people based on the question like their education qualification, gender and whether a student or an employee and the further questions were asked as mentioned below:



**Fig.2. Educational Qualification**



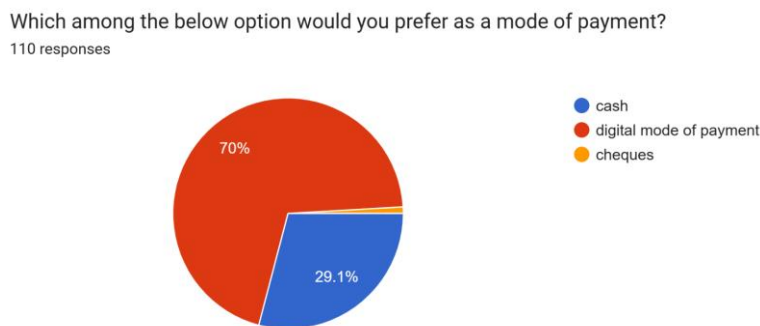
**Fig.3. Student or employee ratio**



**Fig.4. Gender Ratio**

### 5.2.1. Which mode of payment would you prefer

Mode of payment is one of the major aspects while making a plan to implement CBDC. Based on research, around 88% of households use phones in India, where 35.4% of them use smartphones. As the technology is advancing, the mode of payment preferred by the public is digital payment over cash.

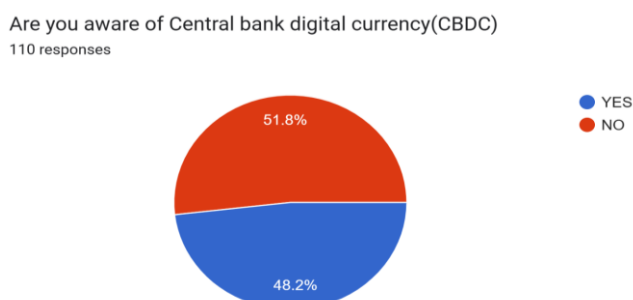


**Fig.5. Mode of Payment**

### 5.2.2. Are you aware of CBDC

In India, as the talks are going on implementing CBDC. Central bank digital currency would help to boost the economy. The need for CBDC in India is to meet the peoples need for digital currencies, central banks faced issues with physical cash and felt that shift to electronic mode of payment.

As shown in the figure it indicates 51.4% of the public are not aware of CBDC. Hence an awareness programme should be initiated before implementing CBDC.



**Fig.6. Awareness of CBDC**



### 5.2.3. Which would you prefer: e-rupee or cash

Based on the survey taken, As CBDC is an electronic mode of transaction, almost all people now use digital mode of payment rather than cash. As shown in the figure, the public mostly prefers e-rupee which makes it easy to implement CBDC in India.

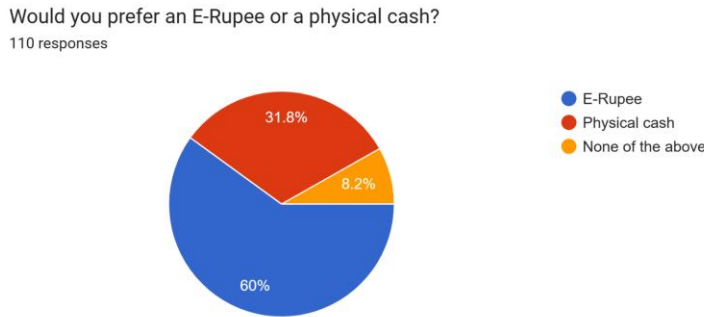


Fig.7. e-rupee or physical cash

### 5.2.4. Preferred mode for transaction

Even though the mode of digital payment is used highly, in India there are people who still prefer cash. So based on this perspective a survey was made to analyse which mode of transaction is preferred for different ranges of money.

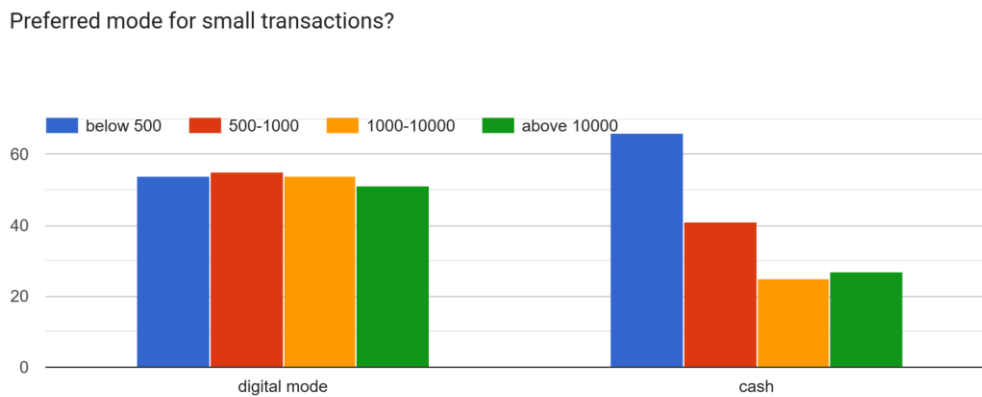


Fig.8. transaction mode for small value of money.

## 5.3. Challenges Faced by Digital Currency

Since digital currencies, like e-Rupee, are still a relatively new and complicated technology, its success may depend on resolving certain regulatory issues. There have been suggestions to outright forbid the use of digital currencies, but India has not yet created specific regulations on the subject. To guarantee the security, dependability, and usability of a digital currency, sufficient digital infrastructure, instruction, and regulations are needed. It is crucial to thoroughly weigh the advantages and disadvantages of using digital money.

### 5.3.1. Competition From other Payments Options

Other digital payment choices, such bank-based digital payment systems and current cryptocurrencies, will compete with e-Rupee in terms of usability, support system, creative mechanism, and low transaction

fees. India is home to multilingual and multicultural people. The architecture ought to support multiple languages and offer users who might not speak English well an easy-to-use interface. Since consumers in India are price-sensitive, high transaction costs are likely to turn them off. Cheap transaction fees should be provided by the architecture to promote adoption and usage. Since there are a lot of underbanked and unbanked people in India, using incentive systems could encourage the usage of digital currencies. Techniques like transaction rewards and referrals should be incorporated into the architecture.

#### 5.4. Prospects of e-rupee

In comparison to physical currencies, digital rupees may have a number of benefits for India, particularly in terms of boosting productivity, encouraging financial inclusion, and enhancing payment system security and transparency. e-Rupee will provide all of the transaction benefits associated with other forms of digital currency and is likely to be easier, quicker, and less expensive. It is practically the same as banknotes. The Indian economy and society stand to gain greatly from the digital Rupee's modernization of the financial system and decreased reliance on cash. The Indian government has indicated that it is interested in encouraging the usage of virtual currencies and has taken action to assist in the creation and uptake of the e-Rupee. This has the potential to boost e-Rupee's credibility and promote its usage. The digital Rupee will be accepted by the government as fully legal money. The Reserve Bank of India (RBI) will maintain authority over the digital Rupee, unlike other cryptocurrencies, which are entirely decentralised. Every transaction occurring on networks that have been authorised is visible to the RBI and government.

#### 6. Conclusion

Central bank digital currency (CBDC) is a liability which has cash-like attributes. Introduction to CBDC leads to higher potential and boosts the economy and reduces the dependency on cash. In this 21st century, developing digital currency has been a very good discussion and this research is still being continued. Even though CBDC leads to lack of privacy to the public, it is advantageous to the government as it provides financial intermediaries. As compared to crypto currencies, CBDC is considered to be better as it is centralised and is fiat currency. The benefit outcome and risks of CBDC provides a contrasting image whereas the pros look into the ways of inviting CBDC to the country but the cons show the negative image which is a great task for the government and central bank to work over it and develop CBDC to a successful plan. It is dependent on the country on how they plan and develop the CBDC. India is a predominantly cash-based nation, where physical currency is used in a huge number of transactions. The risk of counterfeiting, the difficulties of identifying and taxing transactions, the expense and time involved in creating and distributing physical currency are just a few of the reasons why this can be problematic. The RBI's e-initiative, which can be used to send and receive payments using QR codes or through the respective parties' digital Rupee wallets, basically aims to replace traditional currency notes in wallets. People may find it simpler to conduct electronic transactions and payments, which might promote financial inclusion and spur economic growth. The e-Rupee will be a safe haven for wealth and be exchangeable on par with other currencies. It will also be accepted as payment.

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