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Digital Money in the Indian Context: An In-depth Exploration of its Evolution, Implications, and Future Prospects within the Framework of Central Bank Digital Currency



Abstract: - This study conducts a thorough investigation of digital Money in the distinctive context of India, clarifying its development, consequences, and future possibilities, specifically in relation to Central Bank Digital Currency (CBDC), analyzing its potential in the Indian context, its crucial role in the current digital revolution, and the advantages it offers to our country, enterprises, and various user groups. The study proposes aligning our economy with the ongoing digital transition in the global technology scene. In an intangible domain characterized by inexorable advancement, the shift towards a digital economy becomes essential to enhancing our worldwide position.

This research, conducted as an exploratory study, utilizes ideas derived from current literature, case studies, books, and electronic resources. This comprehensive approach offers a clear understanding of key aspects of digital money, such as the idea of blockchain, its many forms and sectors, including wholesale and retail, and the examination of real-world applications in different nations. The study examines investigating phenomena such as initial coin offers (ICOs) and the revolutionary possibilities of Central Bank Digital Currency (CBDC) and examines important literature issued by the Reserve Bank of India, the Bank of England, and existing works on centrally backed currency, as well as by the Bank for International Settlements (BIS).

The data is enhanced through documentary analysis. The article concludes with a detailed and thoughtful discussion, providing valuable ideas and outlining potential future paths. As a result, it is essential to thoroughly categorize user groups for virtual currencies, especially those that have central bank support. This study provides a comprehensive grasp of the complex processes surrounding digital money and its potential to revolutionize the Indian socio-economic system. It is a significant resource for policymakers, industry experts, and researchers.

Keywords: - Digital Money, Central bank digital currency, Indian Economy, Use Cases, Wholesale and Retail Digital Currency, Future possibilities.

I. INTRODUCTION

Nearly six years have passed since the demonetization by the government, and today we are very close to launching our digital currency based on the blockchain technique, which means we are way ahead in digital transformation. Very few countries have their digital currency as legal tender, and if we can launch it successfully with a few pilot studies, then we may become the global leader in the domain; now we are the fastest emerging market in the world in the acquisition of technology especially in terms of monetary and economic aspects. Concerns regarding C.B.D.C. are currently a global phenomenon. They are now vital components of the conversation about how economies are going digital, including the quick changes to the payment industry and the fundamental nature of money.

C.B.D.C. is increasingly being viewed as the next development in the history of (fiat) money. India has advanced significantly in terms of technology in digital payments. India's payment ecosystem has expanded in a controlled manner because the country adopted a specific law regarding payment and settlement systems. Innovative, reducing, easily usable, reasonably priced, practical, effective, secure, and available 365 days a year. Creating trustworthy, round-the-clock digital payment mechanisms like Real Time Gross Settlement (R.T.G.S.) and National Electronic Funds Transfer (N.E.F.T.), which have made real-time or almost real-time fund transfers possible, is responsible for this unexpected change in payment choices. The launch of the digital wallet interface (U.P.I.) and immediate payment service (IMPS) for quick settlements.

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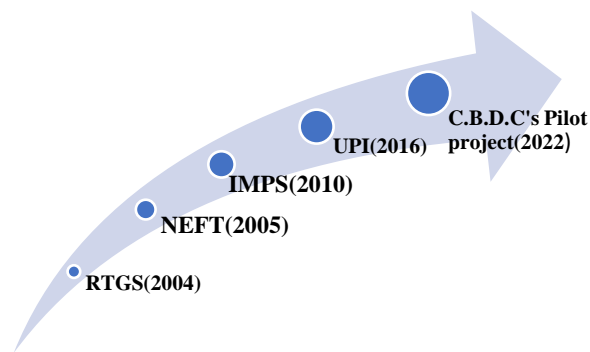


Figure 1. shows developments in India's payment and settlement mechanism over the years

II. RELATED WORKS

Zhang & Huang analysed the concept of Blockchain as well as digital currency (C.B.D.C.), also classified the features of Blockchain and categorized decentralization and safety as its important feature. From the conclusion of the above study, it can be observed that Blockchain is the crucial and elementary aspect of digital currency, and the technology could be proved as an important tool for businesses in respect of digital transformation as well as in longer sustainability.[1] **Lewis Antony**, in his book "the basics of Bitcoins and blockchain," mentioned the important concepts related to the digital currency that will give a boost to the businesses involved in the area like I.C.O., whitepapers and Blockchain etc., from the analysis of literature, it could be clearly noted that with the efficient use of these technical instruments involved in digital currency even having lack of sound knowledge in the domain, any businesses could easily understand the basic terminologies as the book aimed at covering the same.[2] **Lal Suresh** tried to elaborate on the significance of digital currency in the Indian context; the author also concluded the benefits of digital currency and its potential for a digital change, i.e, transformation.[3] **Priyadarshini & kar** in their paper, discussed the issues relating to C.B.D.C. at the conceptual level referring to the Indian scenario. The authors explained the critical issues of C.B.D.C. from the Indian perspective by characterizing it into some sub-sets, like monetary sovereignty, developmental, including technology and innovation, and national sovereignty. They analysed these issues from the point of view of rapid digitalization happening widely at the macro level in the country. [4] **Motwani & Jain** tried to analyse the awareness of Digital currency among the public and the risk associated with it, as the Transaction process of Virtual currencies is Complex and complicated to understand, and it requires sound technical knowledge as well as expertise. According to the above study, the author focused on two aspects: first, awareness and sound knowledge, and second, risk involvement in digital currency among the targeted audience. They wonderfully explained both aspects as their study was not possible without analysing the same.[5] **Sharma Komal** made the study to understand the growth of Cryptocurrency over the years and to compare conventional investments with crypto and did the SWOT analysis to review the prospects of the subject matter. Study shows that Indian Investors still prefers to invest in Conventional sources, but there is an observation about rising of about 640% in adoption from (July 2020 to June 2021) also, in this period, total digital currency transaction from Southern Asia, 42% is coming from the Indian market, and Recently Budget 2022-2023 made some important announcements regarding crypto.[6] **Bhowmik Debesh (2021)** made a study about the merits of C.B.D.C., the digital payment situation in India, and the Monetary aspects involved in C.B.D.C. that, include monetary policy prospects as well. The author also attempted to clarify the concept of C.B.D.C. and its potential to provide significant benefits, such as a reduction of cash dependence and lower transaction costs and Risks. The government of India has also announced bringing its Digital currency to Centralized Blockchain Technology, and the author also explained the mechanism as well in his paper. This paper holistically analysed all the aspects that would be considered crucial and fundamental regarding digital currency with the involvement of a monetary angle as well. In fact, the same is the concern for all the central banks and the various experts who are working in a similar domain.[7] **Ghosh Sharmistha (2021)** tried to elaborate on the concept of Cryptocurrency and its emergence after 2014 regarding various actions taken by the Government of India and R.B.I. from time to time and about the intervention of the apex judicial body, the Supreme Court of the country regarding the upliftment of ban imposed by R.B.I. on Cryptocurrency. [8] **Treleaven, Brown & yang** tried to connect the technology of Blockchain in finance and explored it regarding creating safe, trustworthy records of agreements and transactions in the banking

and financial services domain; in fact, the authors also mentioned the advantages of Blockchain that attracted banking and financial services industry, and they had given it equal importance.[9] **Golosova & Romanovs**, in their study, elaborated on the advantages and disadvantages of blockchain technology, an in-depth review of the same connection with Blockchain and concluded that their advantages are more beneficial than their disadvantages. The to Blockchain and its implementation in different fields of modern industry. The author also elaborated on the problem-solving angle of Blockchain in the industrial arena, such as trust, transparency, security, and reliability of data processing.[10] **Shah Malav** gives an overview of digital currency, its pros and cons & its concept, which includes explaining what digital currency is, its processing, real-life working mechanism and factors affecting the adoption of the same as well as the risk involved in the transaction of digital currency using innovative techniques like Blockchain. The above study clearly states that there is no denying fact that the digital currency will be the future of money in our nation, but for its success in the country awareness among the people will be very much needed to cope-up with the diversified demographic environment in the country.[11] **Ray Anulekha**, in their article, discussed the pilot project of the R.B.I.'s digital rupee, especially for the retail sector and categorized the users, issuing and managing authority, participating banks and cities, also mentioned the usage aspect in the retail sector regarding its potential users.[12] **Frankenfield Jake (2022)**, in his article, defined the concept of initial coin offering (I.C.O.) and its key takeaways and also compared it with the initial public offering (I.P.O.) and pointed out an important aspect that distinguishes both the I.C.O. & I.P.O. that is regulation and regulatory body. The author also explained the working mechanism of I.C.O. that helps companies in raising funds and investors too in analysing the policy paper, which is a white paper that describes the commercial, technical, and financial details of the project.[13] **Concept Note on Central Bank Digital Currency (2022)** issued by the fin-tech department, a subsidiary of the Reserve Bank of India, in the month of October, and this literature subsumed all the aspects related to India's first digital currency. The concept note explained the objectives, alternatives, advantages, and risks of issuing the central bank digital currency, which is to be called the e-rupee (digital rupee). In the concept note, it is also mentioned what is purpose behind issuing this concept note, and that is to create awareness as well as the approach of reserve banks in the same direction. In this note various figures and facts as well as analytical tables of the reserve bank and comparison models.[14] **Rai Vinay (2022)**, in their article, discussed the usefulness of digital currency by the central bank in reference to the viewpoint of I.M.F.'s chief. The author mentioned the global scenario regarding the introduction of digital currency & the role of I.M.F. in motivating the nations to come forward for the same as well as urging them to frame a global law and analyse the technical aspect that will affect the usage by the different groups of users.[15] **Bech & Garratt (2017)** in their study explained the concept of the money flower (taxonomy of money) and a case study of Sweden was also included in this paper that shows Sweden has the highest adoption rates of modern information and communication technology in the world. [16] **Akthar et al., (2019)** conducted a study to review the potential of blockchain technology in digital currency; the authors of the paper connected blockchain technology to the payment mechanism and compared it with the classical payment methods. The paper concluded that Blockchain is one of the most innovative and trending technologies, and its application is not limited to digital currency but rather to multiple venues.[17] **Xing Yi (2022)** in the paper attempted to review Blockchain as a regulatory check and titled the paper digital currency supervision based on Blockchain; as there is fewer regulation policy available in the same, the author focused on U.K. & U.S. existing policies that helped the author to examine the strengths and challenges and usage of blockchain technology to take the edge off on currently executed blueprints. The author also concluded about Blockchain that it is efficient in enhancing the transparency and reliability of transactions which is to be needed in fiat currency.[18] **Zhang, Cheng & Luo (2022)** in their paper focused on the modern covert communication method of transmitting important data that will be done through Blockchain, which has shown the features of strong validity, anonymity, and distributed transmission. They also focused on the practical implication of the group steganography method for digital currency based on blockchain technology to gather information regarding transparency, time efficiency and reduction of risk of losing secret information. The authors concluded their results which show that the proposed method can reduce the number of transactions, save money expenses & improve time efficiency.[19] **Ahmed, Saidu & Kawure(2022)** in their paper discussed the role of central Bank digital currency and focused on the technology & innovation that are the keys to achieving impossible imaginations towards digitization through Blockchain-based digital currency. the study also assessed the role of digital currency based on some parameters like its features, benefits and challenges of both digital and physical currency; authors concluded that the C.B.D.C.-based financial transaction is the best option in terms of physical currency transactions & developing nations need to nurture it regarding laws and legislations as it is novel and emerging innovation in the means of payment.

Conclusion on related work

From the review of various papers, studies, e-sources, and books, it was observed that almost all the literature basically focused on delivering conceptual clarity to the reviewers instead of analysing the current scenario regarding digital currency and its role with respect to digital transformation. Some studies must be brought out rather than e-sources and news articles like research papers to analyse how the users may get benefited by indulging themselves in the area for availing the sake of digitalization, especially for segmented user groups like business-to-business (B2B), business to consumers(B2C) and government to beneficiaries(G2B).

III. BACKGROUND OF THE STUDY

Blockchain

Blockchain is a decentralized technology that manages and records transactions just like a shopkeeper keeps a register or ledger book; similarly, Blockchain is a digital register with decentralization as its key feature. It is popularly known for transactions in cryptocurrencies that were first used by **Satoshi Nakamoto** when he introduced the most popular Cryptocurrency, "Bitcoin," in 2009. Suppose any individual purchases a cryptocurrency; then, simultaneously, a block for the same will be automatically created, and if any individual sells it, then another block will be created; similarly, the number of times an individual performs as many transactions, the blocks will take the shape of a chain by joining together. In this manner, a blockchain performs its primary function of ensuring safety in every transaction.

Every block in a blockchain has its own identity; they have its key for functioning; since it has a decentralized mechanism, any issue at any point of the chain will not interrupt the other ones. In fact, it has the absolute advantage of being secured from hackers, changing any keys or removing any. Blockchain is entirely based on the digital mechanism that tends to use the technical environment of business efficiently, and a digital currency also relies on the same for ensuring safe and transparent trading.

It comes with the benefit of ease in maintaining the information in the form of a ledger and eliminates any middleman or intermediary for maintaining and verifying transactions which also significantly decreases paperwork and errors, a fully transparent system ensures the investors and users that their assets are safe and secure similar to as kept under a custodian, these benefits are very crucial for the businesses to build a bridge of trust between their customers of different backgrounds and income groups, in addition to issues of trust, Blockchain offers further commercial advantages, such as cost savings from accelerated speed, effectiveness and automation (**Lewis Antony, 2021**).

What the Blockchain contains:

1. A data repository (database) that logs data changes. They have typically been financial transactions up until now, but a blockchain can store and track changes to any form of data.
2. Real-time duplication of the data storage across many systems. Blockchains that are "broadcast," like Bitcoin and Ethereum, guarantee that all data is transmitted to all participants and that everyone can view everything. Where the data is sent depends more on other technologies.
3. "Peer-to-peer" network design as opposed to a client-server architecture Instead of being distributed by a sole coordinator functioning as the primary source of information, data may be "gossiped about" to the neighbourhoods.
4. Digital signatures and hashes, used in cryptography, can be used to manage to write access and establish ownership.

Purpose of Blockchain by their types.

Public and private blockchains are driven by distinct goals. Let us discuss each of them separately.

Public blockchains have so far been widely employed in the following sectors:

1. Speculations
2. Cross-border payments

3. Initial coin offerings (I.C.O.)

Speculation

There is little doubt that speculating is the primary application for Cryptocurrency. People trade these coins for a lot of money, and their prices are erratic.

Since there are no recognized techniques for valuing cryptocurrencies, market volatility is expected to endure for some time. This contrasts with conventional financial systems, where pricing models aid in limiting prices within generally accepted bounds. Equities are priced according to established standards. Calculations of discounted anticipated cash flows, current value, and enterprise value can aid in reaching an agreement on a company's value. Ratios, like the cost of each share, price to profits, and return on investments, can be utilized to evaluate the share prices of related companies. Comparative economic statistics serve as the foundation for fiat currency trading.

Cross-border payments

Another sector in which public Blockchain is being utilized for the receipts and payments of international transactions is mainly for remittances, payments, and settlements of international businesses, settlements in international money and capital markets, as well as banks and financial institutions, inclusive of both retail and wholesale transactions. Mainly cost and time matter here, as these include the following foreign exchange exposures translation, transaction and economic(operating)exposure. And the concept of an initial coin offering (I.C.O.) is explained separately in the paper.

Private blockchains are designed to improve the technology and security of business-to-business communications. They eliminate the requirement for a third party to act as a supervisor by enabling distinct digital assets to travel freely and dependably across businesses. Smart contracts on private blockchains can be used to enable transparent multilateral workflows and show that the agreed-upon procedures are followed. This is what "trust less automation" refers to. A smart contract guarantees that pre-programmed procedures be followed rather than requiring trust in a company to carry out as promised.

Any time a firm engages with some other enterprise to share workflows, procedures, or assets, private blockchains could be helpful. Most businesses require interaction with other firms in order to function as shown in **figure 2**, below the para. The first sector to invest in, comprehend, and apply this technology was the financial services sector, particularly wholesale banking, and the financial markets. This makes sense given that business-to-business operations, intermediates, and digital assets dominate the industry and that the "back office" has not seen a lot of investment in decades. Perhaps another factor that attracted banks to Bitcoin was its description as a cryptocurrency. Innovation in, among several other things, digital footprints, distribution networks, finance, health, acquisition, housing, and asset registries is now attracting the attention of non-financial industries.

Examples of notable private blockchains are R3 Corda, Digital Asset G.S.L., Hyperledger Fabric, JP Morgan Quorum, etc.

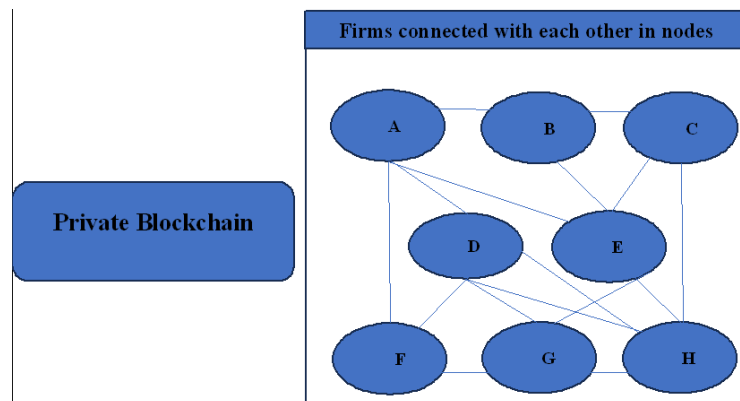


Figure 2. showing nodes that connects firms in a blockchain

Since the digital currency featuring Blockchain is related to information technology, its categorization must be done under Fin-Tech, which means using the technology to enable banking and financial services. This is one of the fastest-growing areas across the globe.

Despite its intricacy, Blockchain has virtually limitless potential as a decentralized method of record-keeping. Blockchain technology may possibly find applications beyond those mentioned above, ranging from improved user privacy and security to reduced processing costs and fewer mistakes. But there are some drawbacks as well.



Figure 3. shows strength and weakness of private blockchain

I.C.O.s (Initial coin offerings)

I.C.O.s are a new way for companies to raise money, just like initial public offerings (I.P.O.s) for raising money, but with the advantage of non-dilution of ownership as compared to shares. To raise funds, here companies must create a new coin. And there is a necessity to have an application/software for the buyers who wish to purchase the coin of a particular entity (**Lewis Antony, 2021**).

I.C.O.s were popularized in 2017 but were earlier entitled "crowd sales" between 2013–14 and mid–2017. Ethereum, a well-known cryptocurrency 2015, first came out through the procedure of initial coin offering, which means it has been developed from the phase of the coin to the digital currency; that time, its I.C.O. was launched at (67 Rupees) valued at Indian currency and in 2022 it was trading at the value of (121000 rupees) approx. (**Lewis Antony, 2021**).

In the working mechanism of I.C.O.s, companies describe a particular product or service in a document called a whitepaper. According to Wikipedia, a white paper is an authoritative report or policy paper that usually describes commercial, technical, and financial details of the project, including The project's goal or aim, which incorporates the existing issue and its resolution and a significant step in the development of a good or service as well as the qualifications and experience of the project team, also the anticipated amount of all fundraising and How the money will be handled and spent at various productive locations, the use and application of these coins.

C.B.D.C (Central bank digital currency)

Any currency, money, or like an asset that is available in the virtual form rather than physical is categorized under the concept of digital currency, considering the above meaning of digital currency, and simply adding a centralized mechanism i.e., central bank as its custodian that means the C.B.D.C. will be a fuller digital version of fiat currency featuring legal tender.

As per the utilization layout, C.B.D.C. has the following two core segments: wholesale and retail. The wholesale segment's C.B.D.C. is a newly built platform for inter-bank dealings; likewise, the call money is used to arrange short-term finance between commercial banks. Wholesale C.B.D.C.s attempt to improve the effectiveness of settlements, both pay-outs and securities, internal and cross-border and primarily target financial companies (banks and nonbanks) & major corporate treasury centres as their principal consumers. Enabling nonbanks with direct links to central bank accounts may or may not be a part of this, while the Retail segment mainly operates for the retail customers of banks as well as individuals and their businesses for payments and settlements. Retail C.B.D.C.s are designed with end users in mind, and they may be used for a variety of purposes, including the distribution of social benefits, at e-commerce point-of-service locations and peer-to-peer transactions for both banked and unbanked users.

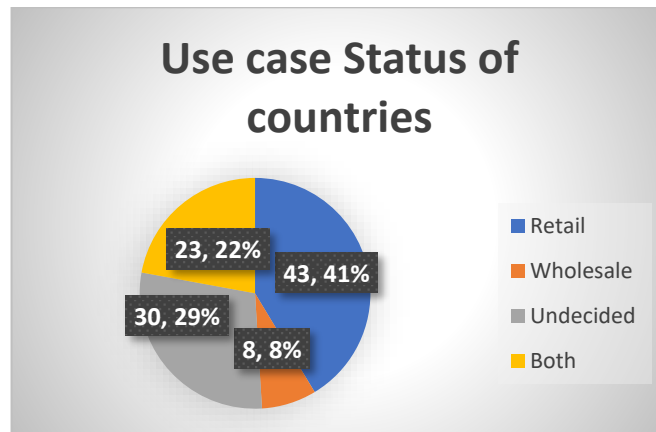


Figure 4. showing use case status of different countries regarding the two segments of CBDC

In **figure 4**, through pie chart the use-case status of different countries across the globe is being described, in which type of use-case either Wholesale or Retail or both have been followed by the nations, and according to the **Atlantic Council Geoeconomics Centre**, out of 103 countries, a majority of 43 nations, representing (**41%**), have opted for Retail CBDC, and the option of retail segment is justifiable as going through the concept of same this segment serves a large users nation-wide like individuals and businesses and on other hand wholesale segment serves for inter-bank dealings and for that 23 nations representing (**22%**) are working on same segment but both the segments are essential for an economy to grow at their highs, so (**8%**) of the nations are working on both use-cases but despite of these nations some have not yet decided the use-case they might be working on the technical aspects but our nation is quite clear on the same as we are going to work on both the segments i.e. Retail and Wholesale CBDC.

C.B.D.C.s are fundamentally different from other types of digital currency in that they have a government guarantee or central bank deposits as their direct backers. They can therefore combine advantages in the domains of trustworthiness, regulatory consistency, and audit transparency, offering stable value in the process. Depending on the intended targets and use cases of a central bank, C.B.D.C.s can be established under a range of technological models. C.B.D.C.s can be administered via digital-ledger technologies as well as central bank agents; therefore, they are not always dependent on decentralized applications.

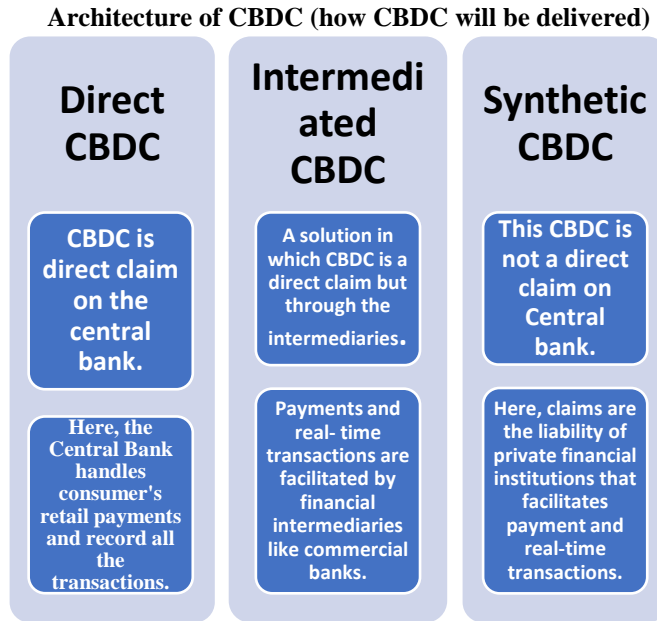


Figure 5 shows the proposed architecture of CBDC, source: RBI's Concept note

Recently, in the quarter (October–December) 2022, The Indian Government announced its first pilot study to use C.B.D.C.s or Central Bank Digital Currency, starting today, marking a new turning point in the nation's economic ecology. The electronic rupee will be referred to as the "E-rupee." The second pilot project would be launched in a closed user class of users and dealers on the retail usage of the digital rupee within a month of the said trial, which is to be started in upcoming months in the wholesale market for subsequent trade in government securities.

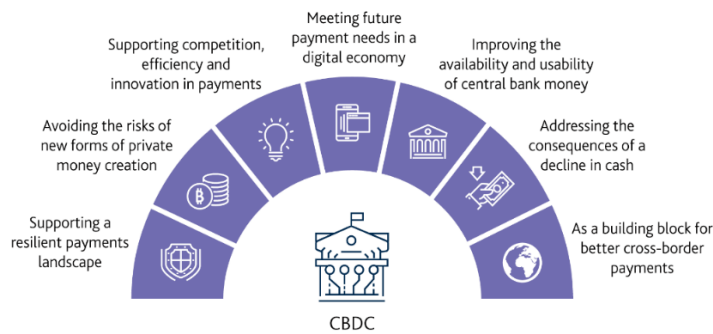


Figure 6 - source: bank of England discussion paper march 2020

Figure (6) shows that C.B.D.C. may offer a variety of alternatives for the bank's pursuit of its goals of preserving economic and financial stability & the offered alternative could be immensely beneficial for the Indian economy as its features innovation in payment mechanism, cross-border settlements, and the idea of the digital economy.

Let us elaborate the concept of digital currency through figure (7) of the money flower

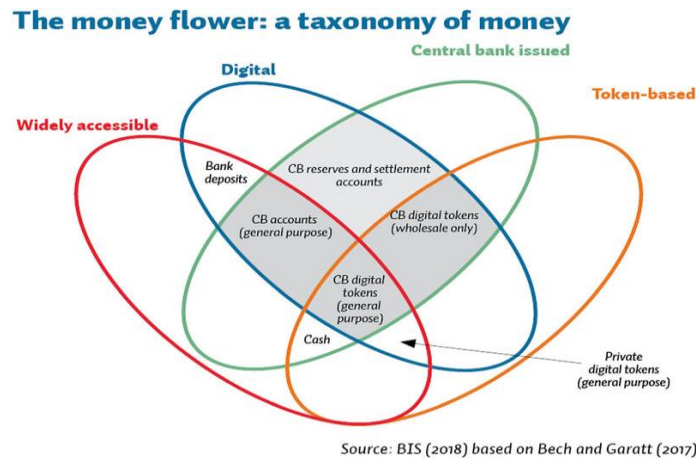


Figure 7. CBDC elaborated through money flower

In the Venn diagram depicted above there are four essential characteristics of money: issuer (whether a central bank or not); shape (whether digital or physical); ease of access (whether widespread or limited); and innovation (account-based or token-based). Central banks are indicated by the letters C.B. and C.B.D.C., respectively. Digital or virtual tokens (general purpose) feature cryptocurrencies like Bitcoin and Ethereum, as well as digital assets and money. Not all jurisdictions provide easy access to bank deposits.

Two primary categories of C.B.D.C. are widely observed: first is for general purpose (also known as retail), and second, the wholesale, as seen in the grey zone of Figure 2. In essence, the former is open to everyone, whereas the latter is a digital token with restricted access used for wholesale settlements (such as interbank payments or securities settlements). Retail C.B.D.C.s may use tokens or accounts. In the former, accounts like those typically maintained at commercial banks are held directly by the public with the central bank (Bech & Garratt, 2017).

Government of India & digital currency

Although the decisions regarding monetary matters usually rest with the central bank of a country, if the circumstances are associated with the international level especially in case of an emerging issue regarding research & exploration for the whole world and to their central monetary authorities, then the government of any country has to come forward and to take several big decisions as well as to frame some policies in respect to curtail any technical glitch that may affect the economy in any manner.

Digital India was one of the ambitious plans of the government; the way in which the use of digital means started, especially after demonetization, it was not less than the digital transformation for the country itself, whether it was N.P.C.I. or R.B.I. both gave a precise direction to this work, presently the government of India is looking very conscious regarding successful Launch of digital currency as well as to frame various laws regarding the same.

It has been clearly observed from the actions of the government as they launched the digital rupee's first phase of the pilot project in December 2022, with the help of four banks, namely S.B.I., I.C.I.C.I., Yes Bank, and I.D.F.C. First Bank and chose four cities for the retail sector that is New Delhi, Mumbai, Bengaluru, and Bhubaneswar. subsequently, in fact, the government itself has a lot of concerns regarding global formalities involved in digital currency, recently finance minister had some serious talks with the director of I.M.F. during her last visit in the country just before the upcoming G-20 summit that is to be held in India, F.M urged I.M.F.'s director to ensure global coordination and synchronized approach on regulating the digital currency globally.

IV. RESEARCH METHODOLOGY

Focusing on the nature of the subject and the topic that is being taken for study, an exploratory research methodology was employed using the qualitative technique of documentary analysis for examining various existing works of literature with respect to the central point with respect to the use of blockchain technology, its types, strengths and weaknesses, sectors of utilization, and the idea of the same regarding its prospects in the Indian context.

For the purpose of the study, secondary data was opted and complemented through documentary analysis which included the use of literature from the source of different databases from the year 2017-2022 in the form of research papers, articles, books, and various electronic sources like concept notes of the government and R.B.I. that helped a lot in elaborating the utility of digital currency with blockchain technology and the benefits for the same in the future. Discussions have been included regarding the need for central bank digital currency (C.B.D.C.) in India, including some suggestions regarding legislation and protocols in some specified domains.

Methods

Documentary analysis- to determine the concept of CBDC, a review of relevant literatures for conceptualization of various terminology involved in it like segments of a CBDC, this will entail looking up and analysing scholarly journals, official documents like RBI's concept note, circulars etc; and other pertinent sources from different international monetary organisations.

Visual Representation- figures are employed to distinguish between several categories like architecture of CBDC, developments in India's payments and settlement mechanism over the years, private blockchain also data which visualized use case of different countries across the globe by using pie-chart and CBDC's elaboration through money flower (Bech & Garratt, 2017).

V. RESULTS AND DISCUSSION

Digital currency for India

From the analysis of various literatures, it is stated that using Blockchain technology safety and security plus feature of programmability will make digital currency more trustable especially in the India where users may hesitate to keep their money in digital form and it will also reduce the burden of then government on granting the subsidies to the banks in the lieu of charging zero transaction costs on UPI transactions of payments and settlements. Keeping in mind some of the aspects that will be helpful for the users, referring to the context of our country and focusing specifically on the retail and wholesale sector, which consists of general individuals, businesses, and beneficiaries. The main aspects are classified into three user categories, which is the central point of discussion: First, business-to-business (B2B) digital currency will provide them ease in payments and settlements as there will be no involvement of any intermediary or a third party and no compulsion of any transaction cycle, which means all transactions between one another will take place on a real-time basis, and similarly, all cross-border transactions between two entities will take place in real-time despite the time zone difference and the accounting exposure. Second is business-to-consumer (B2C), which is one of the most crucial aspects of the retail sector. Even though we have observed the rise in digital payment mechanisms after the demonetization in the country, the users of a particular class are the most numerous, and for them, it will be an easy and safer alternative as there will be no requirement of bank accounts and specific bank authorization like U.P.I., where the bank acts as an intermediary, and the amount is settled between two parties later on despite reflecting values in their particular bank accounts and through the Blockchain, all these accounts will be maintained with the use of distributed ledger technology. And the third category is Government to Beneficiaries (G2B); the beneficiary's majority includes rural residents, urban poor, low-income households, financially supported students, and social and economic weaker groups as well as the disadvantaged groups (**visualized in figure 8**). As these groups are funded by the government, they can be categorized as "wholesale sector beneficiaries." Via digital currency, the government can easily remit its funds without the involvement of any bank or an intermediary. Sometimes the settlement cycle may hinder both parties as there is a delay in accessing the funds by the end users, but after the full implementation of digital currency, all these activities will be monitored through Blockchain and will take place in real time, which will benefit both the government and the beneficiaries.

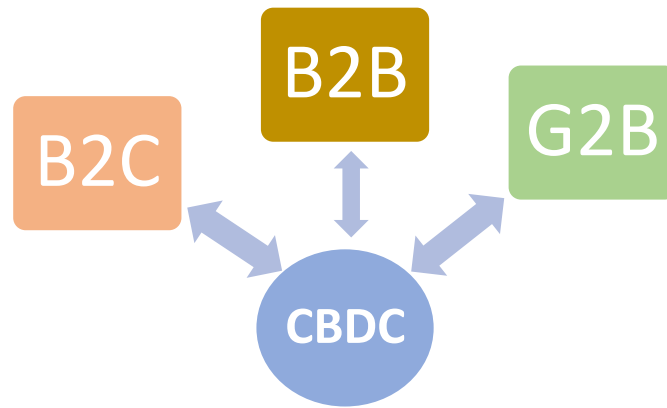


Figure 8. Showing user categories that may be benefited from CBDC.

5.1 Suggestions

Firstly, Strict KYC (know your customer) norms and A.M.L. (Anti-money laundering) measures to be followed by the authorities, which include the requirement of a holistic data protection act that will cover the entire laws and regulations regarding using and extraction of data that will ensure the privacy and secured transaction to the users and robust framework, since Digital currency relies on internet connectivity to function, and obstacles during the process of transactions may hamper the whole process, which could be an annoying experience for the users, especially in the case of time-bound payments, where they may face the trouble of a breach in their creditworthiness, and there will be the problem of network connectivity in remote areas. The problem of internet connectivity may be somehow resolved by using N.F.C. (near field communication), which is a short-range wireless technology that enables our devices like smartphones, tablets, and payment machines to reliably transfer information between devices in less time and with ease, like the payment of bills through NFC-enabled phones and debit cards that do not need an internet connection to function.

Since digital currency is in the underdevelopment phase, the government and R.B.I. should have to educate people across the nation regarding the same; they must popularize the benefits of digital currency and the necessity of bringing it very soon.

Direction for future research

Watching the international scenario, the war between Russia and Ukraine shined a spotlight on digital currency as both countries raised donations through it. Many international organizations had imposed restrictions on Russia, but with the help of the crypto market, Russia raised money for military actions. The current need of the time is to analyse the future perspective of digital currency in the Indian context, as well as monetary aspects related to the Central Bank, and to explore digital currencies in terms of their working mechanisms so that businesses can get a stake and enable themselves to be globally efficient in terms of technology and innovation with sustainability.

VI. CONCLUSION

The major aspect of the paper was to study the concept of digital currency for India on the platform of Blockchain, and by performing the same, we observed that digital currency might bring transformation in the information technology as well as for the users of the country because, when we went through different works of literature, we observed that it has a higher potential that may bring a revolution in mechanisms by the use of blockchains that are already mentioned in the paper, especially for those businesses that eagerly require the same operation. We discussed the benefits and significance of digital currency, as well as why we need it. We also divided users into three groups: business-to-business (B2B), business-to-customer (B2C), and government-to-beneficiaries (G2B), which we mentioned in our paper about some important benefits that may help them and issues relating to foreign or cross-border settlements. This is a great time and opportunity for our country to take a big step forward in launching our digital currency based on blockchain technology.

Acknowledgement :

We acknowledge that we did not get any financial support from any institution or by any authority for this work.

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