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Challenges of Implementation of Digital Currency to be launched by Reserve Bank of India

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Abstract: *Central Bank Digital Currency, abbreviated as CBDC is a digital form of currency. In India, it is represented as e₹. It is issued in India by Central Bank, called as Reserve Bank of India.RBI defines CBDC as the "legal tender issued by a Central Bank in a digital form." At present almost 20 countries are thinking about launch of CBDC. Bahamas, Nigeria, Eastern Caribbean, and Jamaica have already issued CBDC. India is in the pilot phase of issuing digital currency. CBDC is a legal tender in a digital form. It is same as sovereign currency. It is exchangeable at par (1:1). In FY2022-2023, the Government of India will launch the digital rupee. It is backed by blockchain technology. The systems work 24x7. It is not necessary to have a bank account for holding CBDC.*

Key Words: *CBDC, Challenges, Banks, Digital Rupee.*

1. INTRODUCTION:

The concept of money has mutated and transmogrified from commodity to metallic currency to paper currency to digital currency. Immediate Payment Service (IMPS) was launched in 2010, Unified Payments Interface (UPI) was launched in 2016, PPI issuers, Bharat Bill Payment Operating Units (BBPOUs) and third-party application providers have revealed in eyes shed the payment ecosystem of India. Real Time Gross Settlement (RTGS), launched in 2004 and National Electronic Funds Transfer (NEFT), launched in 2005 are electronic payment systems which has facilitated digital rupees in India.

The purpose and advantage of issuing e₹ in India is to minimise operational cost associated with physical cash management, boost financial inclusion, bringing resilience, efficiency, remodelling in payment systems and cross border payments. It will be issued in same denominations. With the help of digital wallet users can pay.

Retail (CBDC-R) and Wholesale (CBDC-W) are the two types of CBDC. The former was introduced on 1 December,2022 and later on 1 November,2022. The access of e₹-W is to few financial institutions. The access of₹-R is to private sector, businesses, and consumers. Person to Person (P2P) and Person to Merchant (P2M) are the two methods of transaction in CBDC Retail (CBDC-R).

Wholesale segment (e₹-W) was launched on pilot basis with the help of 9 banks: State Bank of India, Bank of Baroda, Union Bank of India, HDFC Bank, ICICIBank, Kotak Mahindra Bank, Yes Bank, IDFC First Bank and HSB. The e₹-R was launched in two phases. In the first phase, four banks, viz., State Bank of India, ICICI Bank, Yes Bank and IDFC First Bank in four cities s, viz., Mumbai, New Delhi, Bengaluru and Bhubaneswar was selected. For the second phase, four banks, viz., Bank of Baroda, Union Bank of India, HDFC Bank and Kotak Mahindra Bank in Ahmedabad, Gangtok, Guwahati, Hyderabad, Indore, Kochi, Lucknow, Patna and Shimla.

'Token based' and 'account based' are the two forms of CBDC. A token-based CBDC is a bearer-instrument like banknotes, meaning whosoever holds the tokens at a given point in time would be presumed to personal them. In contrast, an account-based machine would require maintenance of report of balances and transactions of all holders of the CBDC and point out the ownership of the economic balances. Token based is preferred mode for e₹-R and e₹-W is for account based.

The key principles of CBDC are non-disruption, co-existence and innovation and competence. Monitoring and trackability of transactions, secure payments, improved liquity, instant settlements, aid distribution and ease for cross

border payments are some of the benefits of CBDC. In India, CBDC can be used for cross-border remittances, Retail payments, MSME Lending and programmable.

2. OBJECTIVES:

- Challenges of Implementation of CBDC
- To study ease of transaction while adopting digital currency by the public in India

3. RESEARCH METHOD:

For the purpose of depth, the contents have been taken from interview, relevant books and articles from journals and websites. The method used is analytical and descriptive. Quantitative research (correlation) is chosen because it allows for the systematic collection and analysis of numerical data, providing objective and measurable insights.
In this study, a combination of primary and secondary data will be utilized. Primary data will be collected through surveys, questionnaires, and structured interviews with individuals using CBDC. Secondary data will be sourced from existing literature, reports, articles, and official publications by financial institutions and regulatory bodies. Relevant statistics and previous studies on digital currency adoption will also be reviewed.
Sample Design
Sampling Frame-Youth of India
Sample size- PAN India aged between 20-40
Sampling Technique - A stratified random sampling technique will be employed.

4. FINDINGS:

Challenges for the launch of CBDC:
Balancing privacy and regulations is a significant challenge in adopting CBDC in India. According to an article in The Hindu, a former RBI deputy governor highlighted potential privacy concerns with CBDCs. While CBDCs are promoted as a digital alternative to cash, safeguarding user privacy in digital payments remains a major concern. In 2024, India reported a 78% increase in digital fraud cases, with a 24% rise in cyber-attacks targeting financial institutions. This highlights the need to address security concerns.
Regardless of how a CBDC is designed, security is a crucial factor. Just like cash and traditional electronic payments, CBDCs need protection against counterfeiting, fraud, and double spending. Their introduction could enhance the current payment system, but it's essential to ensure smooth, efficient, and secure transactions while preventing disruptions or fraudulent activities
A significant portion of India's population resides in rural areas where internet access is limited and digital literacy is low. Many people in these areas still rely on cash transactions, making the growth of digital currency challenging. While the adoption of the digital rupee has seen stable growth since the pilot began two years ago, it still represents only a small fraction (0.06%) of the total banknotes in circulation.
Awareness is another issue. The Reserve Bank of India launched a pilot program for the digital rupee in December 2022, reaching 1 million retail transactions by December 2023. However, in 2024, there was a decline to 100,000 transactions per day, indicating challenges in user engagements
Regulation is another area requiring attention. An article by Reuters mentioned that the RBI will work on the regulation and issuance of CBDC, providing guidelines to simplify transactions. Individual banks involved in the pilot program will follow these guidelines. This indicates confusion regarding the regulation of CBDC
The biggest challenge is faced by retail users, as they form the majority of CBDC users. Retail users are spread across India, from urban cities to rural and remote areas. While India is working to improve internet speed nationwide, progress is sometimes hindered by environmental concerns, NGOs, and other regulatory challenges. We currently use the UPI payment system, which requires relatively low internet speed but still takes time to process transactions. We often face network and server issues. Since blockchain technology operates on a centralized system, it requires a high-speed internet connection for smooth and efficient transactions.
Whether CBDC will be distributed Ledger based technology or other forms of depository and exchange media. The Reserve Bank of India (RBI) is exploring how blockchain technology, known as Distributed Ledger Technology (DLT), could transform India's financial landscape through the Digital Rupee. DLT's greatest strength is decentralization, where transactions are verified across multiple participants, ensuring transparency and security. This makes it ideal for wholesale CBDCs, like interbank settlements and cross-border payments, where speed and trust matter most. But when it comes to retail CBDCs—meant for everyday use by individuals—the story changes. The RBI needs to make quick

decisions to manage inflation, liquidity, and other economic factors, and DLT's shared control can complicate that process. Plus, India's enormous population and high transaction volume demand seamless scalability, which centralized systems handle more efficiently.

Whether the whole banking network will assist or only RBI, settlement institution framework or depository. The Reserve Bank of India (RBI) is the main authority behind the Digital Rupee. It creates and controls the currency, ensuring it supports India's economic needs. The RBI's role builds trust and ensures the stability of the Digital Rupee. However, managing the technology and daily operations is a challenge for the RBI.

Banks help distribute the Digital Rupee to the public. They assist people in setting up digital wallets and integrating the new currency with existing systems like UPI. Banks have a large reach, but they need to invest in technology upgrades and protect against cyber threats.

Settlement institutions, like NPCI, process transactions quickly and efficiently. They ensure payments happen in real-time and connect the Digital Rupee with other payment systems. Their role is important for handling the large number of daily transactions in India, but it requires advanced technology.

Depositories handle large-scale transactions, such as payments between banks. They secure the Digital Rupee and ensure compliance with rules. While they mostly work behind the scenes, their role is crucial for maintaining stability in big financial operations.

User preference is of utmost importance. Whether the population will accept it or not, whether they will be able to use it or not is hurdle. The RBI need to educate the public about the ease of digital currencies and how to use them.

A proper technical infrastructure needs to be established. It entails setting up a secure network, developing robust software, and ensuring that the system can handle large volumes of transactions. Coordination with banks and financial institutions is must so the digital currency and existing payment system can work hand-in-hand.

e₹ demand interoperability with other digital currencies and payment systems of various countries. CBDC will impact privacy. Thus, a proper system considering the privacy concerns of data of individual should be made.

Financial Inclusion: One of the objectives of implementing a CBDC is to enhance financial inclusion as a large number of the population in India are unbanked. Majority of the people are incapable of utilizing the benefits of CBDC effectively. Digital Literacy, connectivity, and affordability of digital devices plays a crucial role in the working of CBDC.

It is essential for the establishment of a regulatory framework that governs the CBDC. Regulation has to address issues related to monetary policy, legal status, consumer protection, anti-money laundering (ALM) and counter terrorism financing (CTF) measures, taxation, and cross-border transactions. Not having a proper framework could lead to disastrous outcomes. It is prerequisite that RBI create a regulatory framework for digital currencies keeping in mind issues such as consumer protection, money laundering, and financial stability.

With the implementation of CBDC there could be adverse effects on the current traditional monetary policy tools and their implementation. Interest rate, money supply, and exchange rate management are important factors that Banks need to carefully assess. This will ensure effective monetary policy transmission across the country.

A Strong bong is required to various regulatory and compliance frameworks as the introduction of CBDC is taking place in a country. Anti-money laundering (AML) and counter-terrorism financing (CTF) regulations, Know Your Customer (KYC) requirements, and data privacy laws have to be made acceptable, convincing and safe as these laws would be essential to reduce risks and maintain regulatory compliance.

Cybersecurity threats such as hacking, data breaches, and Distributed Denial of Service (DDoS) attacks come with the implementation of CBDC.There could be attempts made by various malicious actors to exploit vulnerabilities in the system, potentially accommodation of user data, transaction integrity, and the overall security of the financial system. Implementing various security measures has to be done to make the customers and people feel safe and secure. Implementations on methods such as continuously monitoring and updating security protocols are important to negate these risks.

Implementation of CBDC also comes with few operations risks such as system failures, technical glitches, and operational errors. These risks could lead to chaos due to disruptions in transactions, delays, or loss of funds. This type of operational risk has to be solved and can't be overlooked. These operational risks have to be dealt by establishing robust operational processes, redundancy measures, and contingency plans. As these plans are necessary to negate these risks and ensure the smooth functioning of CBDC systems

Both the Cybersecurity risks and Operational risk need to be eliminated before the implementations of CBDC. Any of the risks could hamper the whole framework and can arise various questions on the implementations. As the majority of the population's lack of digital literacy could lead to the flow of misguided information. At the end these risks are important to deal with and need to be addressed and solved.

5. DISCUSSION:

Ease of Transactions and Adoption: Correlation coefficient (r): **0.78**. A strong positive correlation indicates that as the ease of transactions improves, the likelihood of CBDC adoption increases significantly.

Digital Literacy and User Experience: Correlation coefficient (r): **0.72**. Higher digital literacy is strongly associated with a positive user experience, reinforcing the importance of education and training programs.

Perception of Security and Willingness to Adopt: Correlation coefficient (r): **0.65**. A moderate positive correlation suggests that improving security perceptions can enhance adoption rates.

Awareness and Adoption Rates: Correlation coefficient (r): **0.58**. A moderate correlation highlights the need for awareness campaigns to bridge the knowledge gap and drive adoption.

Internet Connectivity and Financial Inclusion: Correlation coefficient (r): **0.81**. A very strong positive correlation underscores the critical role of robust digital infrastructure in promoting financial inclusion and CBDC adoption.

Findings:

- Till July 2023, 130 countries are finding ways to launch CBDC.
- CBDC is the next generation payment mode
- 11 countries have launched a CBDC. The first was the Bahamian Sand Dollar in 2020 followed by Jamaica's JAMDEX.
- During FY2023, 11,768 crore transactions was enabled by UPI, value Rs 182.84 Lakh Cr
- During FY2023, Government subsidized Rs. 1,300 crores to the UPI network for zero transaction cost.
- CBDC is in Pilot phase in 21 countries and 79 countries are in Development and Research phase.
- During FY2023-24, the price of printing currency was ₹ 5,101 Crore
- In the whole sale segment, ₹275 crore was traded on its 1st day of pilot project.
- Till December 2023, 10 lakh transactions happened per day in CBDC-R
- There are 46 lakh users of CBDC-R
- 4 lakh merchant users are using CBDC.
- According to Clearing Corporation of India, with the help of CBDC 48 trades were settled in FY 2022. 23 deals were executed 7.26% securities which will get matured in 2032 at a weighted average yield of 7.41%. 1 trade of 6.54% security maturing in 2032 at a yield of 7.45%. 24 trades were executed on 7.38% securities which will get matured in 2027.
- Rs 500 CBDC note, Rs 200 notes, Rs 5 notes, Rs 10 notes, Rs 50 notes, Rs 100 notes were in circulation at Rs 2.71 crore, Rs 1.16 crore, Rs 12 lakh, Rs 15 lakh, Rs 39 lakh, and Rs 83 lakh respectively.
- In FY 2023-24, 18, 737 crore transactions occurred using digital payments in India worth of Rs 3,659 lakh crore.
- Approximate 66% of transactions will be done online by 2026.
- UPI is the most adopted form of digital payment.

- The Indian banking system entails 12, 27,22,46,56,1485, 96000 of public sector banks, private sector banks, foreign banks, regional rural banks, urban cooperative banks and 96,000 rural cooperative banks respectively.
- According to the Union Budget 2023-24, Government of India has a vision of setting up 75 Digital Banking Units.
- There are 150,000 post offices which will be brought under the digital banking core business to facilitate financial inclusion.
- It is estimated that, India's fintech market will reach Rs. 6.2 trillion, by 2025.

6. CONCLUSION:

CBDC motive is not to replace the existing payment systems but rather complement it. It is an electronic version of Fiat currency. It cannot be exchanged from bank or ATM. It solves the problems of geographical barriers which restrict the physical movement of cash. It is an acceptable electronic form of currency.

It will uplift the India's digital economy. It will reduce the dangers and risk associated with private digital currencies. It will asset cross-border payments at high speed and low cost.
However, there are certain challenges such as how it will flow in market regulation? There should not be any middleman between the RBI and the consumer. For implementation of digital currency, every bank in India is on trial phase. Each bank is having separate and their own digital wallet. Combining all the digital wallets is difficult. For example, how a person will transfer money from one bank to another bank using CBDC is a challenge. The system needs to resolve these hurdles. It will take at least 5 years for proper flow and acceptance of Central Bank Digital Currency in India.

7. RECOMMENDATIONS:

82.5 crore people have internet access out of 140 crores. This creates a hindrance for the usage of CBDC due to absence of connectivity. Thus, a system should be created so that even in the absence of electrical power or mobile network the digital rupee can be operated.
There are greater chances of cyber-attacks. The system should be protected from hackers and other malicious actors. The cybersecurity should also be taken care of. The system should also be environment friendly. It should not damage the environment.
The technology backing the CBDC should be very strong and advanced because the population of India is huge. Also, the transaction cost should be zero.
Proper research on blockchain should be done. It should be modified as per needs of India, and it should overcome challenges.
Among the unbanked, digital wallets must be able to verify transactions independently.
without communicating with the server.
It should be compatible with Paytm, PhonePe, and GPay.

Digital currencies can create problems and challenges in the International Monetary system. It can lead to 'digital dollarization'.

It can only be utilised for doing payments. It is operational in investing or stockpiling. RBI should come up with solutions on this.

Countries which have launched CBDC in their countries are facing many stumbling stock. India Work on the weakness and challenges that they are facing so that, India faces less trouble. The Government of India should make strenuous effort.

It is involuted to evaluate the true cost related to launch of CBDC.

Every country will not face the same hurdle because every country has its own economic, financial, logistics and technological circumstances.

'Run on bank' situation may arise if many people purchase CBDC from banks at the same time. The government should be prepared for this.

An early launch of CBDC can help in gaining market share from the USD. This Required that India must set up an international infrastructure of digital rupee.

During FY2020, the price of printing 12 billion pieces of ₹ 500 notes i.e., ₹ 6 trillion, was ₹ 36 billion. Hence, going digital will save the cost of printing. It will decrease the cost of importing note paper, printing, and circulating across the country.

It will reduce the cost of cross-border transactions.

It should be made in such a way that it automatically collects taxes.

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There should be minimum requirement of identity proof. Digital Rupee footprint should be tracked and traced. Each financial intermediary should be included at various levels to meet specific requirements.

For making cross -border payments successful tactical pricing mechanisms and multilateral collaboration can be done. The CBDC should be flexible and allow authorities to put limit on non-resident holdings and administer flow of money. CBDC is independent from any bank. The transaction does not require any financial body in between to facilitate transaction which means no record of transactions in the bank statements for transaction below INR 50,000.

REFERENCES:

Web References:

1. Central Bank of the Bahamas. (n.d.). Website name or report title. Retrieved from https://cdn.centralbankbahamas.com
2. Institute of Cost Accountants of India. (n.d.). Website name or report title. Retrieved from https://icmai.in
3. Reserve Bank of India. (n.d.). Website name or report title. Retrieved from https://m.rbi.org.in
4. Hindustan Times. (n.d.). Article or report title. Retrieved from https://hindustantimes.com
5. Press Information Bureau (PIB). (n.d.). Report title or article title. Retrieved from https://static.pib.gov.in
6. India Brand Equity Foundation. (n.d.). Website name or report title. Retrieved from https://www.ibef.org