

# Public Views on Information Technology in Banking and Embracing Central Bank Digital Currency- A Study With Reference to India



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*This research endeavors to investigate how information technology (IT) has significantly contributed to the efficient and successful transformation of banking operations. Banks have adopted technology to improve customer satisfaction, streamline operations, and cut expenses. Since the introduction of digital banking, clients no longer need to visit physical branches in order to obtain banking services. IT has enhanced service delivery, making it more convenient and accessible. The utilization of digital platforms has reduced the necessity for in-person encounters and allowed clients to complete transactions instantly. IT's effectiveness in the banking industry is constrained by issues including data breaches, cyber threats, and the digital divide. To remain competitive, reduce cyber security risks, and enhance customer satisfaction, banks need to make investments in technology and data privacy.*

**Keywords:** CBDC, Block Chain Technology, Digital Banking, Information Technology, Currency

## 1. Introduction

Banking sector has a rapid growth today. To make the banks to survive in the competitive world, they started to adopt the latest technologies. It enables the bank to get prevented from the challenges that the bank is facing in the competitive environment. Information technology helps the banks to have better infrastructure and sophisticated product. It helps the bank to reduce the risk of hacking. An introduction to the 'cyber cash', collection of the telephone bills, electricity bills has become easy by the help of information technology.

### Central Bank Digital Currency (CBDC):

The Central Bank Digital Currency (CBDC) is form of digital currency. The CBDC is issued by the Reserve Bank of India. This digital currency is similar to the cryptocurrency and same like the fiat currency it will also have the same value. Many countries such as China, Bahamas, Sweden, Nigeria, United Kingdom, Russia, Canada, Singapore, Malaysia etc have implemented the CBDC. A CBDC is issued and regulated by central bank. The implementation of fiscal and monetary policy has simplified the financial inclusion.

The Reserve Bank of India (RBI) has issued the central bank digital currency in the form of digital rupee which is the replacement of fiat money. Unlike the crypto currency CBDC is the centralized form and it is regulated by the central Government. It uses the technology called as the blockchain technology. They are designed to provide the secure and convenient form of the digital cash to make the digital payments easier for the individual and for the business people. It is greatly influenced by the monetary policy of the country and trade surpluses. CBDC is based on the digital ledger. This trend has accelerated during the covid 19 pandemic. There are two types of CBDC which is a pilot study conducted by the Reserve Bank of India. This have been implemented only in four states of India they are Bhubaneswar, Bangalore, Delhi, Kolkata. The two types of CBDC are wholesale CBDC and retail CBDC. The CBDC uses the technology called as blockchain technology and distributed ledger technology.

## 2. Review of Literature

**Sreejitha (2021)** explored a study on the role of information technology in banking. The study focused on examining the relationship between IT and Banking sector. It analyses that how the customers are aware about the technologies in the banking such as the latest technology such as ATM, debit card, credit card, mobile and internet banking. This research is based on the analytical study and random sampling is use to know about the customer satisfaction and their attitude towards delivery channels. 24\*7\*365 e-banking services reduced the cost and the time.

**Shamim Ahmad (2022)** studied the impact on Digital currencies on unsecure and unclear economic window and its necessity to regulate or to ban in India. The Reserve Bank of India has familiarized the CBDC for the innovative work on digital currencies. This research shows that the issues arise on the instalment framework honesty, security, the micro economic contemplations for the monetary dependability. It also shows the financial arrangement and monetary framework.

**Abdul Jabbar et.al (2023)** studied the impact on Investing individual privacy with CBDC, privacy calculus perspective. CBDC is a technology based digital innovation. This paper examines the potential user of CBDC technology. The research is

based on the Quantitative survey and which shows the privacy of consumers. This research says that participant thought that their personal information has been shared to the third party.

**Vu minh Ngo et.al (2023)** studied the impact of Governance and monetary policy impacts on public acceptance of CBDC adoption. The research says that the central bank digital currency is helping the Government to have an economic growth. The research shows that however the CBDC is familiar and a new initiative by the Central Government but public support for acceptance of the CBDC is less and for the success it requires a substantial public support. The research took survey from the 100 respondents.

### 3. Need for the Study

The need for the study is to know about the public perception on adoption of the CBDC and how it will impact the growth of the economy. As digital currency has been used in many countries and in the terms of public perception, the European Central Bank (ECB) found that the 40% of the respondents in the Euro would be willing to use CBDC and 34% would stick to using the cash. As per RBI, digital rupee has reached 50,000 users and 5,000 merchants as of 8 February 2023. This study is conducted to know when it comes as a usage in all states how many respondents is willing to use the CBDC and how many of them is not willing to use CBDC. The main aim of this study is to know about the respondent's trust towards CBDC, security issues like hacking, data breaches, privacy and willingness to use the digital currency and what may be barrier for them to use the digital currency and the benefits to the Government by adoption of CBDC

#### Objectives of the Study

##### Primary objective:

- To analyze the public perception towards adoption of CBDC

##### Secondary objectives:

- To examine the impact of digital currency in Indian economy
- To analyze the relationship between the Payment apps and CBDC
- To find the level of awareness about CBDC among the public
- To know about the security, privacy, acceptance of CBDC with the help of information technology

#### Scope of the Study

A trusted and widely usable CBDC must provide accessibility, security and convenience to the public. The various technical designs have been implemented for this. The scope of the study is to make the public to be aware of CBDC, suggestions given to solve security issues involved in CBDC, trust building among the public. The main focus of the study is to increase speed of transactions, suggesting to make CBDC as a user friendly and ease to use.

### 4. Research Methodology

The research work carried out in this study is a deductive method which involves setting up of hypothesis and arriving at a solution based on the data and the hypothesis. This study design belongs to Descriptive research as it aims to describe a population perception based on the questions asked such as what, where, when and how to investigate one or more variables. The research method used here is quantitative research method as many numerical data has been used.

**Research Design:** Descriptive research is used.

**Source of Data:** For the purpose of the conduct of the study, primary data is used.

**Research Instrument:** Structured Questionnaire which consists of 5 demographic questions, 5 multiple choice questions, 2 dichotomous questions and 17 Likert scale questions.

**Sampling technique:** Convenience sampling technique is used to collect the samples from the part of populations that is close to hand.

**Sample size:** The study was carried out with 111.

**Statistical tools used:** Chi-square analysis, Multiple linear regression, Friedman test, Factor analysis, Pearson correlation.

#### Data Analysis and Interpretation

##### Percentage Analysis

S.no	Questions	No of respondents	Percentage of respondents
1.	Gender of respondents		
	Male	51	45.9
	Female	60	54.1
2.	Age of respondents		
	20 to 30 years	66	59.5
	30 to 40 years	20	18
	40 to 50 years	20	18
	Above 50 years	05	4.5
3.	Income of the respondents		
	Below Rs 3,00,000	49	44.1

	Rs 3,00,000 to 5,00,000	32	28.8
	Above Rs 5,00,000	30	27
4.	Educational qualificationDiploma	05	5.5
	Under graduation	30	37
	Post graduation	56	62.2
	Higher secondaryProfessional	20	4.5
5.	Occupation of the respondents	11	9.9
	Public sector	34	30.6
	Private sector	14	12.6
	Self employed	11	9.9
	Homemaker	38	34.2
	Students	3	2.7
6.	Habit of using payment apps formoney transfer	107	96
	Yes	4	4
7.	Frequency of using payment appsfor money transfer	28	25.2
	Once in a day	31	27.9
	More than twice a day	24	21.6
	Once in a week	18	16.2
	More than twice a week	8	7.2
	Once in a month	2	1.8
8.	Payment app sused by there spondents for money transfer	71	64
	Gpay	19	17.1
	Phone Pe	19	17.1
	Paytm	2	1.8
	Bhim app		
9.	Comfortable of the respondentswhile using payment app	15	14.2
	Rather comfortable	73	65.2
	Very much	3	2.7
	Not at all	20	17.9
10.	Awareness about Central bankdigital currency (CBDC)	80	71.4
	Aware	17	16.1
	Neither aware or unaware	14	12.5
11.	Perception of the respondentsprefer to use currency	37	33.3
	Physical currency	74	66.7
12.	Digital currency is the bestalternative for physical currency	94	84.6
	Yes	17	15.4
13.	Respondents agree that RBI has taken a good initiative of bringCBDC	27	24.3
	Strongly agree	65	58.5
	Agree	17	15.3
	Neutral	2	1.8
14.	Respondents think RBI CBDCwould be used by the rural people	19	17.12
	PossibleMay be	46	41.44
	Not possible	46	41.44
15.	Factor influence respondents the most to use CBDC when it is available	20	18.01
	Reduce transaction cost	45	40.54
	Avoid exchange of torn notes	27	24.34
	Avoid theft of cash	19	17.11
	Ease to use		
16.	Security issue respondents think in adoption of CBDC	73	40.6
	Cyber attacks	68	37.8
	Data breaches	39	21.7
17.	CBDC helps Government to havethe following benefits	66	35.9
	Reduce tax evasion	73	39.7
	Reduce the circulation of blackmoney	30	16.3
	Helps Government to generaterevenue	15	8.2
	Allows funds to enter into bank		
	<b>Total</b>	<b>111</b>	<b>100</b>

### Barriers in adoption of CBDC of the respondents

Factor	1	2	3	4	5	Total	Average	Rank
	(*5)	(*4)	(*3)	(*2)	(*1)		(1/15)	
Lack of awareness	250	112	33	18	13	426	28.4	1
Rely on smartphone application	105	148	72	34	12	371	24.73	2
Difficulty on understanding the use of CBDC	75	40	21	38	60	234	15.6	5
Security and privacy concerns	60	64	33	100	22	279	18.6	4
Comfortable with the physical currency	65	80	174	32	4	355	23.66	3

Weighted average is used to rank the barriers to adopt CBDC among respondents. It is observed that rank 1 is given for lack of awareness, rank 2 is given for rely on smart phone application, rank 3 is given for comfortable with the physical currency, rank 4 is given for security and privacy concerns and rank 5 is given for difficulty in understanding the use of CBDC.

**Factor Analysis-** The 22 dimensions has been reduced to 8 components by using the factor analysis. Where each component is used to proceed with further analysis such as multiple regression, Chi square analysis and Friedman test. The component 1 is named as monetary impact of CBDC in Indian economy, the component 2 is named as security and privacy concerns to adopt CBDC, the component 3 is named as consideration to adopt CBDC based on usage, the component 4 is named as trust on CBDC and barrier to adopt CBDC, the component 5 is named as level of adoption of CBDC and barrier to adopt CBDC, the component 6 is named as consideration to adopt CBDC and monetary impact, the component 7 is named as trust and barrier to adopt CBDC, the component 8 is named as barrier to adopt CBDC.

### Rotated Component Matrix Component

1	2	3	4	5	6	7	8	
If you are the payment app user will you adopt the Central Bank Digital Currency as well	-.747	.023	-.110	.052	.126	.119	.006	-.011
Speed of transactions	-.039	-.801	.009	-.091	.054	.096	-.060	.058
Trust worthiness	.098	-.676	-.239	.152	-.003	.091	.183	-.024
Security	-.066	.081	.004	-.141	.799	-.174	.100	.115
Privacy	.123	.802	-.131	.037	.101	.183	-.099	.056
Convenience	-.073	.575	.241	.047	-.639	-.165	-.063	-.151
CBDC helps the Government to reduce money on printing the paper currency	-.116	-.096	.119	-.265	-.125	.721	-.197	-.014
CBDC helps the country to move towards cashless society	.075	.222	.114	.159	.256	.257	.052	-.299
It provides access to financial inclusion	.431	-.098	.043	-.150	.086	.498	.012	.124
It helps to participate in International currency markets	.678	.195	.053	.029	.251	.331	-.091	.024
Requires more of Investment in technology	.743	-.025	.228	.132	.026	-.022	.090	-.048

will convert most of my physical currency into CBDC when it became available	-.074	.058	.250	.185	-.064	.731	.226	-.091
I will use CBDC for person-to-person transaction	-.119	-.162	.672	.133	.408	.130	-.202	-.219
I will use CBDC for my shopping	.255	.127	.718	.176	-.113	.111	.068	.098
I will use CBDC to receive my salary	.358	.104	.628	.019	.009	.117	.251	.227
I will use CBDC for all my transactions	.317	.034	.748	-.125	-.122	.163	-.145	.011
level of trust you have in Reserve Bank of India	-.806	-.026	-.156	.230	.069	.076	.076	.001
Lack of awareness	-.042	-.153	-.131	-.566	-.178	.103	.601	-.075
Rely on the smart phone application	.118	.046	-.004	-.554	.394	-.035	.301	-.423
Difficulty on understanding the use of CBDC	.040	.018	.119	-.004	.179	-.001	.032	.887
Security and privacy concerns	.036	.129	-.030	.112	-.190	.021	-.882	-.028
Comfortable with the physical currency	-.117	-.017	.075	.906	-.120	-.084	-.085	-.119

**1. Multiple Regression-** To test significant difference between adoption of central bank digital currency (CBDC) and factors to be considered important to adopt CBDC

**H0:** There is no significant difference between adoption of CBDC and factors to be considered important to adopt CBDC

**H1:** There is a significant difference between adoption of CBDC and factors to be considered important to adopt CBDC

**Table showing multiple regression between the adoption of CBDC with factors to be considered important to adopt CBDC**

R	R square	Adjusted R square	Std. error	df1	df2	Sig F
0.700	0.827	0.427	1.918	12	98	0.000

**Interpretation**

From the above table it is revealed that the significance value is 0.000 which is less than 0.05 (i.e  $p < 0.05$ ), therefore Null hypothesis  $H_0$  is rejected. It shows that there is a significant difference between the adoption of CBDC and factors to be considered important to adopt CBDC. The independent variable such as security, privacy, trust, CBDC usage and barriers to adopt CBDC influences the adoption of CBDC by the public.

The R square value is 0.827 where it shows that 82.7% of the adoption of CBDC which is a dependent variable is influenced by the independent variable such as security, privacy, trust, CBDC usage and barriers to adopt CBDC.

**Regression Equation**

$$Y = 4.381 + 0.26(\text{security}) + 0.065(\text{privacy}) + 1.475(\text{trust}) + 0.348(\text{usage of CBDC}) - 0.436(\text{Barriers to use CBDC})$$

**2. Chi-square Analysis**-To test the association between security issues in adoption of CBDC and preference to adopt CBDC. For this analysis component 2 and component 5 is used.

**H0:** There is no association between the security issues in adoption of CBDC and preference to adopt CBDC

**H1:** There is an association between the security issues in adoption of CBDC and preference to adopt CBDC

**Table showing Chi square test between security issues in adoption of CBDC and preference to adopt CBDC**

	Value	DF	Sig value
Chi square	34.587	36	0.536
Likelihood ratio	39.284	36	.325
Linear association	1.631	1	.202
N of valid cases	111		

**Interpretation**

From the above table it is revealed that the P value 0.536 is more than 0.05 (i.e  $0.536 > 0.05$ ), therefore Null hypothesis  $H_0$  is accepted. It shows that there is no association between the security issues in adoption of CBDC and preference to adopt CBDC

**3. Chi-Square Analysis** - To test the association between adoption of CBDC and monetary impact of CBDC in Indian economy (CBDC requires more investment in technology). For this analysis component 5 and component 1 is used.

**H0:** There is no association between adoption of CBDC and monetary impact of CBDC in Indian economy (CBDC requires more investment in technology)

**H1:** There is an association between adoption of CBDC and monetary impact of CBDC in Indian economy (CBDC requires more investment in technology)

**Table showing Chi square test between adoption of CBDC and monetary impact of CBDC in Indian economy**

	Value	DF	Sig value
Chi square	69.318	36	0.001
Likelihood ratio	72.798	36	0.004
Linear association	18.565	1	0.000
N of valid cases	111		

**Interpretation**

From the above table it is revealed that the P value 0.001 is less than 0.05 (i.e  $0.001 < 0.05$ ), therefore Null hypothesis  $H_0$  is rejected. It shows that there is an association between adoption of CBDC and monetary impact of CBDC in Indian economy (CBDC requires more investment in technology).

**4. Friedman Test**- For this analysis component 2 and component 6 is used

**Table showing factors to be considered important to adopt central bank digital currency (CBDC) based on respondent choice**

Factors	Mean rank	Rank
Speed of transactions	3.57	1
Trust worthiness	2.70	4
Security	3.01	3
Privacy	3.41	2
Convenience	2.32	5

**Interpretation**

From the above table it shows that the speed of transactions with the mean rank of 3.57 is being ranked 1. The privacy with the mean rank of 3.41 is being ranked 2. The security with the mean rank of 3.01 is being ranked 3. The trust worthiness with

the mean rank of 2.70 is being ranked 4. The convenience with the mean rank of 2.32 is being ranked 5.

**5. Correlation-**To know the relationship between the payment app used and awareness about CBDC.

**H0:** There is a negative relationship between the payment app used and awareness about CBDC.

**H1:** There is a positive relationship between the payment app used and awareness about CBDC

**Table showing correlation between the payment app used and awareness about CBDC.**

		Payment app	Awareness about CBDC
<b>Payment app</b>	Pearson correlation	1	-0.171
	Sig (2 tailed)		0.073
	N	111	111
<b>Awareness about CBDC</b>	Pearson correlation	-0.171	1
	Sig (2 tailed)	0.073	
	N	111	111

### Interpretation

From the above table it shows that there is a negative relationship between payment app used and awareness about CBDC. It inversely proportional to each other. The p value is less than 0.05 (i.e  $-0.171 < 0.05$ ), therefore it shows the negative relationship between the two variables.

## 5. Findings of the Study

From the above results and discussions, it is revealed that the mean of adoption of CBDC shows that the respondents are high level in adoption of central bank digital currency therefore they have given number 9 maximum repeated times; There is a significant difference between the adoption of CBDC and factors to be considered important to adopt CBDC; There is no association between the security issues in adoption of CBDC and preference to adopt CBDC; There is an association between adoption of CBDC and monetary impact of CBDC in Indian economy (CBDC requires more investment in technology); There is a negative relationship between payment app used and awareness about CBDC. There is a negative relationship between payment app used and awareness about CBDC

## 6. Future Implications of the Research

In the near future, Artificial intelligence and machine learning algorithms can be used to analyze large data. The speed of transaction is considered to be the first in adoption of CBDC so the RBI can design the CBDC protocol, with transaction speed in mind focus on minimizing transaction confirmation times, reduce latency, optimizing data structures to enable faster transactions. Every individual could be allotted a certain amount of anonymity vouchers that could be used for both the small and large transactions. The transactions done will be visible to the financial intermediaries and to the financial authorities so that there is no way for illegal activities and will not result in shadow economy. An appropriate regulatory framework should be developed to govern CBDC. It should be governed by Anti-Money Laundering (AML) which rules out the truly anonymous payments, volumes, reduce dependency on third parties, continuous security updates can be done

## 7. Conclusion

This study was conducted to know about the public perception on adoption of central bank digital currency (CBDC). It is clearly understood that the public is well aware about the CBDC and keen to adopt the digital currency when it becomes available. The CBDC plays a vital role in the information technology as it uses the blockchain technology. It helps the Government to reduce the money on printing the paper currency, helps the country to move towards cashless society, provides access to financial inclusion, helps to participate in international currency markets. The CBDC helps the individual to avoid exchange of torn notes, avoid theft of cash. By adopting CBDC it helps the Government to reduce the tax evasion and reduce circulation of black money and makes the Government to generate more revenue.

There will be an evolution in CBDC over the next decades with all the technological innovation and advancement in technology. CBDC is useful but it is questionable whether it is useful in all times. The introduction of CBDC is also linked to the gradual elimination of cash to move towards so called cashless society. It is very difficult to replace the physical currency as many countries are in pilot study including India. Long way to go and it will be backed by the physical currency.

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