Digital Currency Transition in India: Prospects, Difficulties and Consequences

Research Report

National Centre for Good Governance (NCGG)
Department of Administrative Reforms and Public Grievances, Ministry of Personnel, Public Grievances and Pensions, Government of India

Submitted By:
Name- Deepanjali Kumari
College- Symbiosis School of Economics
Contact Info- deepanjalijha21@gmail.com
Date of Submission- 01/07/2024

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Department of Administrative Reforms and Public Grievances, Ministry of Personnel, Public Grievances and Pensions, Government of India

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CERTIFICATE

This is to certify that Deepanjali Kumari, a student of Symbiosis School of Economics (Symbosis International University), has satisfactorily concluded the research report titled "Digital Currency Transition in India: Prospects, Difficulties and consequences" as part of the internship program at the National Centre for Good Governance (NCGG) under my mentorship.

I, Dr.Charru Malhotra, hereby validate the successful completion of the internship report within the internship program at the National Centre for Good Governance (NCGG). The report submitted by Deepanjali Kumari is an authentic work carried out by /her under my supervision and guidance. I have reviewed and assessed the intern's performance throughout the internship period.

30.06.2024
Charru Malhotra
Professor (e-Governance and ICT)
Indian Institute of Public Administration (IIPA)

ACKNOWLEDGEMENT

This research report on “Digital Currency Transition in India: Prospects, Difficulties and Consequences” is the outcome of contribution and support of many people to whom we owe my project.

I would like to extend my gratitude to Shri V.Srinivas, Secretary, DARPG and DG, NCGG for providing me such an enlightening opportunity of conducting this research. I would further like extend my sincere thanks to Dr. Gazala Hasan, Assistance Professor, NCGG for spontaneous support throughout my research.

Furthermore, I am indebted to my mentor, Dr. Charru Malhotra for being a constant source of knowledge and guidance. She has nurtured my research from a sapling. She has been persistent motivation and help.

At last, I thank one and all who directly or indirectly contributed to the success of this work.

RESEARCHER'S UNDERTAKING

This is to hereby declare that the research paper titled, "DIGITAL CURRENCY TRANSITION IN INDIA: PROSPECTS, DIFFICULTIES AND CONSEQUENCES", submitted by me is based on actual and original work. Any reference to work done by any other person or institution or any material obtained from other sources have been duly cited and referenced. We further certify that the research paper has not been submitted for any other institution. My indebtedness and gratitude to other works has been duly acknowledged at the relevant places.

Deepanjali kumari

CONTENT

"Digital Currency Transition in India: Prospects, Difficulties, and Consequences"

Abstract

India, like many other countries, is exploring the possibility of adopting digital currency as a part of its monetary system. This research aims to analyze the feasibility, benefits and challenges associated with India's potential switch to digital currency, the e-Rupee. By examining the existing landscape, policy considerations, and technological readiness, we can gain insights into the implications of such a vast transition. Key areas of investigation include regulatory framework, financial inclusion, security and the impact on traditional banking systems. This study will contribute to informed decision-making and provide recommendations for policymakers, financial institutions, and the masses as a whole. A comprehensive understanding of the opportunities and challenges associated with India's digital currency transition. Some intriguing questions like the driving factors behind digital currency adoption, its economic and financial goals with potential benefits and transition. We will see the strategic implementation of other countries and ways of implication. Some of the statistical panel regression and hypothesis testing will be done for the same. Hence, the entire study would specifically revolve around India's current monetary policies with its coverage and impact assessment. Some of the policy recommendations for a smooth and secure implementation would be imbibed along with insights into the potential impact on financial stability and privacy. In a nutshell, we will delve into specific aspects, conduct empirical studies, and contribute to the ongoing discourse around digital currency adoption in India.

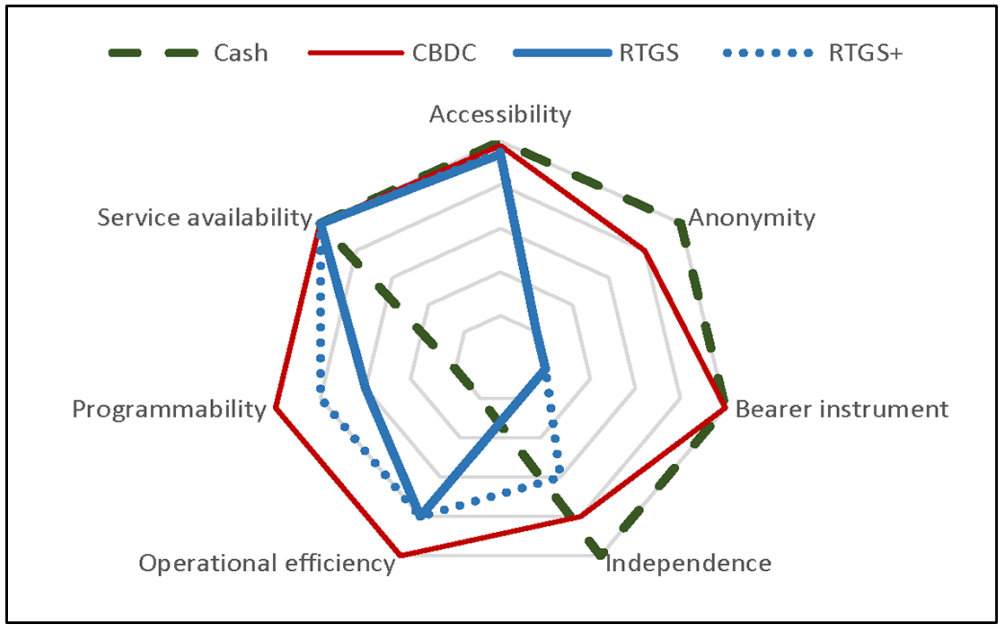
Keywords: Digital currency, e-Rupee, financial inclusion, monetary policy.

1. Introduction

- India being a diverse nation with 22 listed languages, a variety of cultures, ethnicities and traditions has embraced the world's largest population. India has a mega investment in human capital [1]. It becomes challenging for the authorities to reach out to every person. With the arrival of any new policy, its implication and implementation become a problem.
- With this, the Reserve Bank of India has recently announced the launch of "Digital rupee/ e-₹". India has made a remarkable stride in digital payment innovation. Although digital currency is not a new concept, it is just another alternative to the cashless payments offered by consumers [2]. Now the question comes, what is the need for digital currency when we already have so many other existing virtual methods like Real Time Gross Settlement (RTGS), National Electronic Fund Transfer (NEFT), Immediate Payment Service (IMPS) and the most recent one, the Unified Payment Service? The answer lies in its technological

benefits that include a digital form of a bearer instrument, better cost-effective payment services, greater anonymity and a catalyst for greater innovation through programmable money ["Comparing means of payment: What role for a Central Bank digital currency?," n.d. [3]].

FIG 1: COMPARISION OF VARIOUS MODES OF PAYMENT



Source: FEDS Notes. [3]

- Due to the aforementioned reasons, there are multiple digital currencies all across the world that are already in use. Cryptocurrency is the most renowned one, but its only problem is its decentralized nature. Despite the widespread acceptance of these cryptocurrencies as an investment option and their growing popularity in businesses globally, opinions about them have always been diverse.
- The first sect held the belief that digital currencies would emerge as a major force in the financial system. There are those who argue that a non-governmental, independent, and crucially tradable asset is necessary for the global economy [8] (Scott D., 2017). However, others believed that they required a period to build trust in the new currency system. Certain experts contended that transitioning to the new system could lead to information issues, and addressing this problem could offer economic values. Any central bank does not have any control over the transaction of digital currencies like cryptos.
- In the midst of these debates, certain governments opted to embrace digital or cryptocurrencies, while others abstained from making a decision. Those who refrained concluded that prohibiting these currencies would be most beneficial for their respective economies. The governments that promoted the transition to digital currencies did so

because they believed it could address persistent issues such as money laundering, tax evasion, and promote competition. On the other hand, the government that opposed digital currencies argued that extreme caution is necessary when using cryptocurrencies. They argued that since these currencies are not governed by any authority or government, there is no protection in using them. Therefore, in the event of a technical glitch or platform malfunction, investors would not have any recourse.

- Due to this lack of central control, India banned the use of decentralized e-currencies last year ("India bans foreign crypto platforms like Binance, Kucoin. What should investors do now?" 2024) and therefore announced its own CBDC (Central Bank Digital Currency), known as e-₹. Some of the other reasons for launching the e-rupee are the concerns about potential money laundering and financing illegal activities using digital assets and the other one being the decline in demand for the fiat traditional legal tender [6](Author links open overlay panelMd. Asraful Haque et al., 2023).
- Adding to it, the use of digital currencies can help reduce the number of illicit transactions and the use of black money which will increase tax revenue and reduce corruption. Thus, the RBI-backed digital rupee would be much more reliable and secure. The cash inclination in India stands at 17%, which is higher than that of the Nordic countries, the UK, and Australia, in terms of the ratio of cash withdrawn to GDP [5] (Ojha, 2022). This adoption of the digital rupee could lead to a decrease in people's reliance on physical currency, resulting in cost savings related to the management, printing, and distribution of cash. This shift may also provide the government with valuable spending pattern data for enhancing macroeconomic policies and increasing revenue. There are two possible approaches for implementing the e-rupee: Token-based and Account-based.
- Now the question comes to the acceptability and reach of the currency. The success of e-₹ will depend on several factors, including user adoption, merchant acceptance, regulatory banking and public confidence [6] (Author links open overlay panelMd. Asraful Haque et al., 2023). Digital currency is yet a new and complex technology, thus the adoption of digital currency requires adequate digital infrastructure, education and regulation to ensure its safety, reliability and usability.

2. Outline of the Research

2.1 Review of Literature

It has been observed that countries as developed as Japan, Korea, and Sweden to the developing ones like China, Nigeria and the Bahamas are experimenting with their own digital currencies famously known as Sand Dollar, eNaira and e-CYN. Most of the countries are moving towards CBDC because of its convenience, cost-efficiency and a promising characteristic of financial inclusivity and sovereignty. Most recently, India has also become a part of this transformation, as it formally announced its own CBDC.

Pavoor, A. S., & Ajithkumar, N. (2022) in the paper titled, Digital rupee-A rival for cryptos? Has mentioned, "Central Bank Digital Currencies" are virtual money that are being considered for legal tender status and are issued by national central banks. Since the Reserve Bank of India has publicly stated similar targets, it should soon be possible to access a CBDC in India. It is hard to accurately measure the impact unless the advantages and disadvantages of adopting CBDC are considered. The financial system that is in place now is monitoring CBDC. The global use of digital currencies and blockchain technology is accelerating due in part to the expansion of CBDC, which has the backing of national central banks. This study combined the international literature. There have been several private cryptocurrency comparisons made with the Indian digital rupee.

Kumar, A. (2021) The steady transition from paper money to electronic money has had a tremendous impact on the advancement of contemporary payment systems and is essential to the world economy. The government backs CBDC, a digital currency that is issued by central banks. Weaknesses in the current monetary system have come to light as a result of surge in digital transactions and overall banking innovation. Since the introduction of cryptocurrencies like Bitcoin in 2008, the legitimacy of central banks has been called into doubt. Furthermore, central bank supervision is credited by global monetary authorities by instilling public's faith in the banking sector. As per the BIS study, the percentage of central banks aiming to establish a CBDC climbed from 60% in 2017 to 80% in 2019. This paper has focused on the possible effects of CBDC on the economy of India.

Jani, S. (2018) The rapid advancement of information and communication technology has led to increased versatility and efficiency in many aspects of our daily lives. The growth of internet users has given rise to new economic phenomena, such as cryptocurrencies, which are used for various monetary transactions like buying, selling, and trading. Intangible yet valuable assets, cryptocurrencies are employed in peer-to-peer networks, virtual worlds, online social networks, and social games. Virtual currencies are now commonly accepted on a large number of websites. This study looks at what consumers anticipate from digital money in the future, given the current state of unregulated cryptocurrency use. It investigates the level of systemic trust held by Bitcoin

users. The objective of the article is to objectively evaluate the rate of bitcoin acceptance. The research looks into how 21 other countries' legislative and regulatory agencies have responded to cryptocurrencies after studying its impact on the Indian Law.

Farooqui, S. A. (2022) Since cryptocurrencies emerged in 2009, the market for different forms of digital currency has significantly grown. This article examines and assesses the key factors influencing this growth. Claims of a speculative bubble have been raised in response to the skyrocketing prices of digital currencies, mostly due to inadequate regulatory monitoring, the possibility of illicit activity in an underdeveloped and opaque trading conditions, and the damage to the infrastructure brought about by the rise in digital malfeasance. All of these things work against the possibility that currencies based on technology will be accepted as trustworthy financial instruments. New digital currencies have advanced more quickly thanks to central banks, notwithstanding their limited capacity for concentration. More and more economic research is dedicated to studying the impact of CBDCs' "saves for all" feature on consumer spending. Understanding the effects of CBDCs on competitiveness, payment system integrity, and security necessitates considering them within the broader information economy and information dominance. In our analysis of the increasing CBDC literature, we concentrate on the impact of CBDCs on the broader economy, including the monetary stability and financial infrastructure. Additionally, we examine the impact on microeconomic factors such as operational framework, ideation and security.

Kshetri, N. (2023) The feasibility of utilizing the digital yuan to expand access to banking and other financial services was studied. The digital yuan was compared with some of its strongest competitors. Researchers also investigated how the digital yuan could be leveraged by the "Chinese Communist Party" for economic and population surveillance. The study delves deeply into the potential for international use of the digital yuan. This study provides a fresh outlook on the digital yuan as it assists in setting up global standards for digital currencies issued by nations.

Chen, S., Goel, T., Qiu, H., & Shim, I. (2022) According to this paper, central banks have been involved in projects related to central bank digital currencies (CBDCs), or digital money denominated in the national unit of account and a central bank liability, more and more in developed and developing economies in recent years (BIS, 2021). Though each nation's level of participation varies, all 26 central banks that are present at this meeting (refer to Annex Table A1) are actively involved in CBDC research, with a number of them having stepped to the pilot (e.g.: Hong Kong Special Administrative Region (SAR), Saudi Arabia, Thailand, and The United Arab Emirates (UAE)). Some countries (like China's e-CNY) are almost ready to go live, while others (like Poland and Singapore) don't think a CBDC is immediately necessary. The first part of this paper discusses the primary drivers of CBDC participation for EME central banks, with a particular emphasis on the justification for retail CBDCs. The primary concerns of central banks with relation to retail CBDCs are covered in a second part, along with data privacy and data governance. The

final section talks about retail CBDC design options that balance potential issues with promoting central bank goals. The consequences of using CBDCs across borders and associated design issues are covered in the fourth part. High-level conclusions are drawn from the paper's conclusion. The entire document is based on background information and survey results from the central banks that are attending the conference.

Sapovadia, V. (2018) Even with our world becoming more connected, over a third of the population still lacks access to formal financial services. Research increasingly indicates that providing easy access to dependable financial services benefits everyone, including consumers and businesses. Many factors contribute to economic and social marginalization. Shortcomings in the traditional banking system often result in people being unable to afford essentials such as food, housing, and medical care. Growing adoption of digital money and mobile banking provide an opportunity for greater financial inclusion in marginalized populations. Studies indicate that utilizing a conventional financial system for small-value transactions is prohibitively expensive. Utilizing mobile apps and digital currency can simplify and make small transactions more affordable and accessible. The use of mobile technology can lead to quicker, easier, and more precise processing of large financial transactions. Some developing countries are employing mobile phone networks to address financial exclusion. This section delves into how mobile technology is leveraged to offer financial services to the unbanked, exploring its benefits, drawbacks, challenges, solutions, and global implementation.

Yanagawa, N., & Yamaoka, H. (2019) The report examines the growing interest in Central Bank Digital Currencies (CBDCs) and their impact on payment systems and data usage in Japan. It emphasizes the need to find a balance between security and progress in payment infrastructure to maximize economic well-being. The document emphasizes the importance of exploring how CBDCs can improve the efficiency of payment methods and facilitate the efficient use of data. It also looks into the changing relationship between money and data, emphasizing the increasing significance of collecting data through payment mechanisms. Furthermore, it considers the competition among private entities in the payment industry and how it influences data usage and network effects. The importance of incorporating new digital technologies to improve payment efficiency and uphold data security and privacy is highlighted in the document. It points out the necessity of carefully assessing the potential risks linked to CBDCs, such as displacing private payment methods and impacting financial intermediation. Additionally, it discusses the difficulties of maintaining the safety of payment methods while utilizing data effectively, especially in the global shift toward digitalized payments. The document proposes that striking the right balance can be achieved by utilizing different technologies and service providers to encourage innovation in payment services while also ensuring financial stability.

2.2 Objectives:

Therefore, here in this paper, our objective is

- **To measure the Scalability and Access to the digital currency**
- **To observe public acceptance**
- **To observe major challenges, Implication and what we can learn from other nations.**
- **To study the future of Digital Currency**

2.3 Research Question/ Hypothesis:

In an attempt to study the role of the e-Rupee, the following research questions have been formulated keeping in mind the above objectives of the study:

Hypothesis

1. H_0- There is no significant scalability and accessibility of e-Rupee among the general people.
2. H_0- There is no significant public acceptance of e-Rupee

3. Research Methodology

3.1. Methodology

The purpose of the research is to analyse the influence the of digital currency on the populace and the "Indian financial system" in its whole. The paper has dealt with the inception, acceptance and major obstacles in adopting the digital currency in India. "Digital currency" refers to currency that exists only in digital or electronic form, and not as physical paper currency. This means it is not minted, circulated, or held in tangible form. The present study utilizes both descriptive and quantitative research methodologies. The purpose of descriptive research is to document and elucidate the characteristics and events of the subject or sample under study. It entails obtaining data in order to provide a thorough understanding of the phenomenon. Descriptive research focuses solely on presenting the facts using an unbiased and accurate approach. ("Differentiating between descriptive and interpretive phenomenological research approaches,"[9]). The social sciences often use this approach to gain a comprehensive understanding of a phenomenon. Conversely, in order to draw inferences, forecast outcomes, and find relationships between variables, quantitative

research designs entail the collection and analysis of numerical data. It emphasizes how critical it is to evaluate and quantify phenomena using statistical analysis and mathematical models. For answering research questions or putting theories to the test, this kind of study methodology provides objective, measurable data.

We have classified our study into four major regions of India with further bifurcations based on gender, occupation, age, and educational qualification. We have covered India's youth, including students, employed falling between the age bracket of 18-25 years, etc. Although there have been respondents who were above 25 years of age, but they have not been under the prime focus of this study. Apart from this, unemployed, homemakers and retail businesses should have been incorporated in the study to attain in-depth knowledge, but due to lesser awareness among the masses and time constraints, it could not have been satisfied. We have used illustrative graphs and tables for the description and also used logistic regression for testing out the hypotheses and observing our objectives.

1. As already mentioned, research is Descriptive and is based on both Primary and Secondary sources. The information collated from the primary/secondary source is interpreted and analyzed to impart a logical flow of thought & arrive at specific recommendations.

2. The Secondary research is proposed through a literature survey of academic journals, websites, periodicals, policy documents, academic reports, annual reports, news items, reports released by various organisations and agencies.

3. An self-structured questionnaire with convenient sampling techniques are utilized to gather data from 80 individuals. The study population consists of the end users, the general public, making it reflective of the key stakeholders. We are focusing on the younger demographic, as the youth in India represent a large portion of the population, particularly those aged 18-22 years.

4. The study is focused on a sample size of 80, as a minimum bound.

5. Various statistical tools have been used for data interpretation, majorly logistic regression as the data deals with numerous dichotomous variables. The hypotheses are thereafter tested based on the derived results. Apart from this, various descriptive tools will be used for elaborative and illustrative interpretation.

4. Data Analysis And Interpretation

Coming onto the major part of the study, we have first characterized the sample into eight major zones/regions of India. The graphical representation shows that India's western region has the highest percentage that is 26.2% of the respondents. Following this, the northern region has 23.8%, and the eastern region accounts for 15%. The northwestern, southwestern, and southeastern regions contribute comparatively less. We have tried including all the zones to avoid sampling bias. Further, for the convenience of our study, we have grouped North Eastern and Eastern. Likewise, South Eastern, South Western and Southern parts have been grouped and North Western has been grouped with Western India respectively. Accounting collectively, all four regions summed nearly up to 20-22 observations each. This can be further inferred from the table below.

TABLE 1: REGION-WISE RESPONDENTS

Region-specific	No. of Respondents
East	12
North	19
North East	10
Northwest	3
South	11
South East	1
South West	3
West	21
Grand Total	**80**

TABLE 2: GROUPED GEOGRAPHICAL CLASSIFICATION

Region	No. of Respondents
East	22
North	19
South	15
West	24
Grand Total	**80**

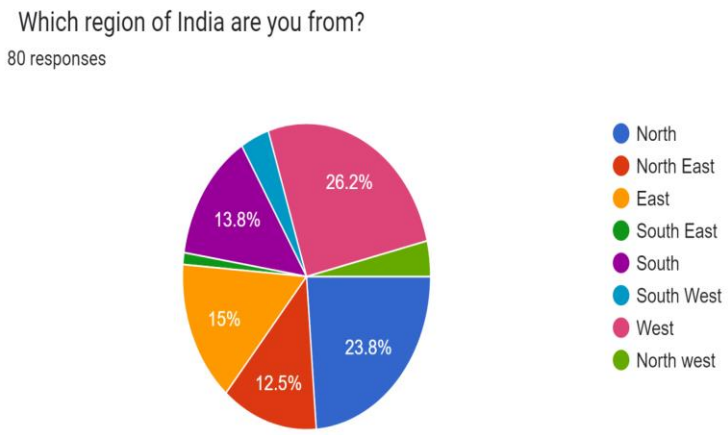


FIG 2: DISTRIBUTION OF SAMPLE ACROSS REGION

As can be seen above, the western region has 21 respondents, followed by the Northern and the Eastern regions. For simplicity, in the second table, we have grouped the regions as has already been mentioned above. All the region is nearing an average respondent of 20. The only part which lacks this count is the southern region. We have elaborated this on the graph presented below.

4.1 Hypothesis Testing

4.1.1 HYPOTHESIS 1: There is no significant scalability and accessibility of e-Rupee among the general people.

As already mentioned, the concept of digital currency is still new in India and it would take a lot of effort to make it handy to each and everybody due to a lack of awareness and financial literacy. We cannot deny the fact that India ranked 73 out of 120 nations in the Internet Literacy Index ("India: Internet Literacy Index by Category 2021," 2021). This indicates a major obstacle of inaccessibility. There are many rural areas in India where high-speed internet facilities are still unavailable, therefore, there are chances that the people would not be able to avail the facilities of the digital revolution. Looking at the brighter side, India is the second largest internet and smartphone user worldwide with a 49.15% internet penetration rate.

Blockchain has proven to be incredibly capable of challenging the currently transparent and safe ways that digital transactions are carried out. Now the question still stands - does it have the ability to serve other real-world applications? The answer to this suspicion lies in the obstacle caused by scalability issues. The current consensus approach, in which each node in the network validates a transaction sequentially before it is published in the blockchain, and the limited block size are the causes of scalability problems. [("Sci-hub | Blockchain and scalability. 2018 IEEE International Conference on software quality, reliability and security companion (QRS-C) | 10.1109/QRS-C.2018.00034," n.d.) [9]] This issue gets worse as there are more transactions, which means the network require more nodes to support it, but there are also more steps involved in obtaining a transaction to proceed and come to full consensus with every node. Additionally, we observe a proportionate relationship between the blockchain's declining scalability and the growth of the network. This becomes one of the main obstacles preventing blockchain from being widely used for practical applications.

Therefore, having known the problem of scalability and coverage of the digital currency amid all the major challenges, we have here tried getting the perspective of the stakeholders/the users of the currency.

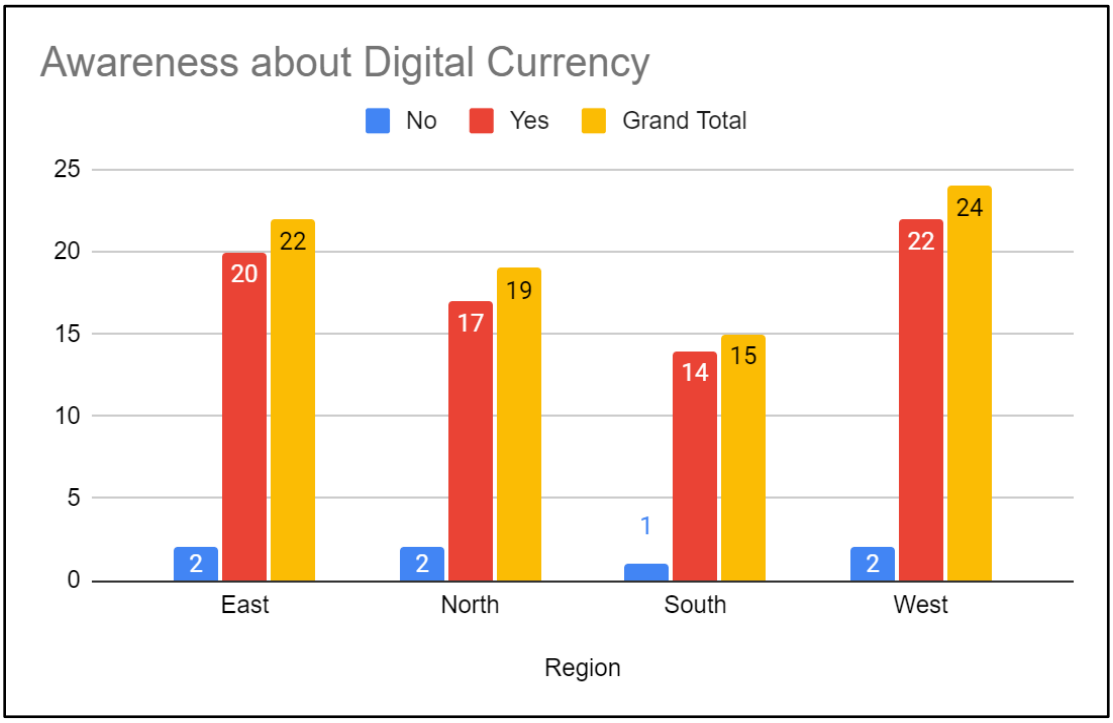
First of all, we have started with questioning the awareness among the masses. There is a striking difference between digital currency and e-Rupee. Centralization is the key difference that makes them distinguishable. Digital currency on the one hand can entirely be decentralized and unmonitored while the e-Rupee or any nation’s Centrally Backed Digital Currency has to be monitored by the central bank. The below table highlights the awareness of the digital currency among the four major regions of India.

According to the graphical representation, people in the western region are the most aware of digital currency, with 22 out of 24 people being aware. In the eastern region, this number ranges to 20 out of 22 people being surveyed. Furthermore, in the northern region, 17 out of 19 people

are aware. This data conveyed well that a significant number of people across these regions are knowledgeable about digital currency. When generally asked, the respondents can only relate to the cryptocurrencies that have been in common supply in the global money market.

FIG 3: AWARENESS ABOUT DIGITAL CURRENCY ACROSS REGION

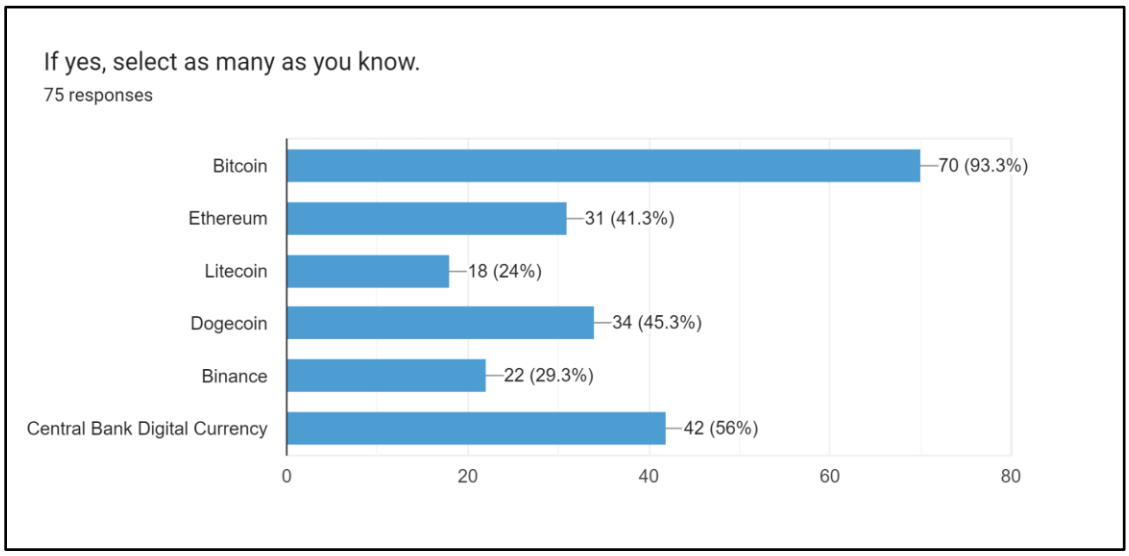
Having already said that, we have further tried to assess their knowledge about the various cryptocurrencies in the market. It was quite surprising that, 75 out of 80 respondents knew alteast



one of the most famously used cryptocurrencies. Some of the majorly listed ones were, Bitcoin,

Ethereum, Litecoin, Dogecoin, Binance. For a subject-specific diversion, we have added centrally backed digital currency at the end. 70 out of 80, which accounts for a total of 93.3% of the respondents knew about Bitcoin, backed by CBDC, which constitutes up to 56%, rounding out to a count of 42 respondents and lastly 45.3% to 41.3% to Dogecoin and Ethereum respectively.

FIG 4: AWARENESS ABOUT VARIOUS CRYPTOCURRENCIES



Knowing about the CBDC does not satisfy the purpose until and unless people have known the Indian CBDC which is the e-Rupee or electronic Rupee. Therefore, following their knowledge about different cryptocurrencies, we have moved on to our area of study which is the awareness and usage of the e-Rupee.

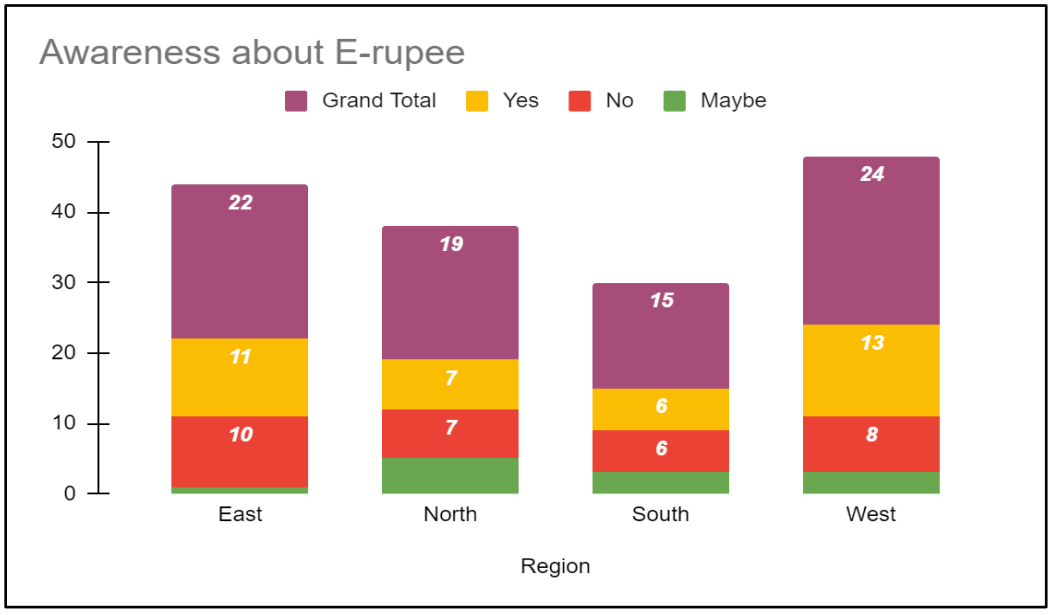
In the four consecutive diagrams from Figure 5.1 - 5.4, we have assessed e-Rupee awareness among four major parameters which are region, demography, educational qualification and occupational status.

- The first figure deals with the assessment across regions. Out of the above 42 respondents who knew about CBDC, only 37 knew about the e-Rupee. When we categorized it among regions, 11 in the East, 7 in the North, 6 in the South and 13 in the West knew about the e-Rupee while, 10, 7, 6, 8 did not know about the same. Apart from this, there were a total of 12 respondents who were not sure about their knowledge of e-Rupee.

TABLE 3: AWARENESS ABOUT e-RUPEE ACROSS REGION

Region	Maybe	No	Yes
East	1	10	11
North	5	7	7
South	3	6	6
West	3	8	13
Grand Total	**12**	**31**	**37**

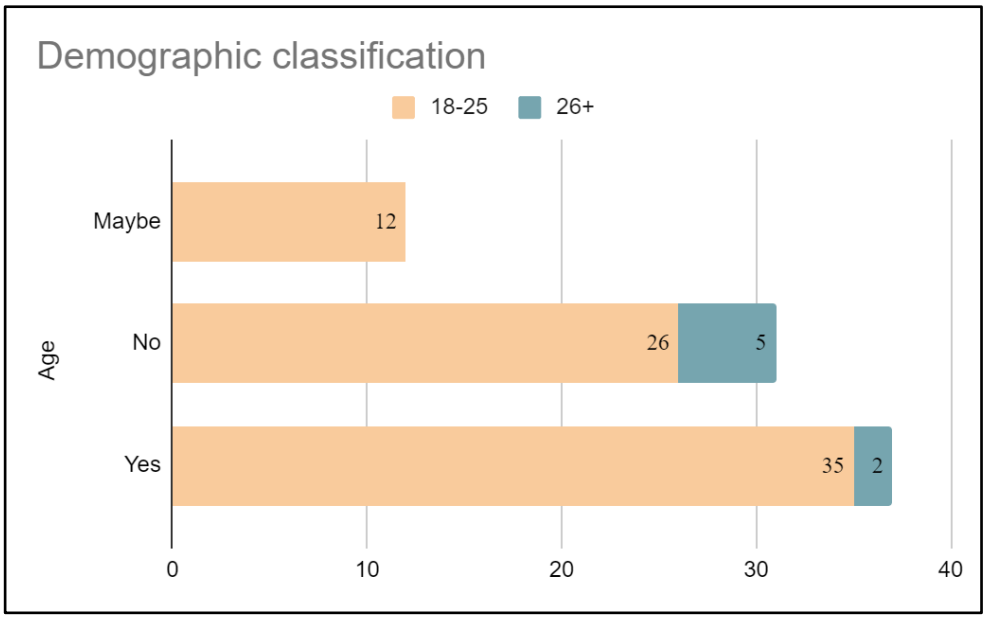
FIG 5.1: e-RUPEE AWARENESS ACROSS REGION



- The below graph provides a demographic classification of survey responses based on age groups. Among respondents aged 18-25, 35 out of 73 are familiar with India's e-Rupee, 26 are not, and 12 are unsure. For those aged 26 and above, 2 out of 7 are familiar with the e-Rupee, while 5 are not. We have to keep in mind that, 18-25 years of people, is the major

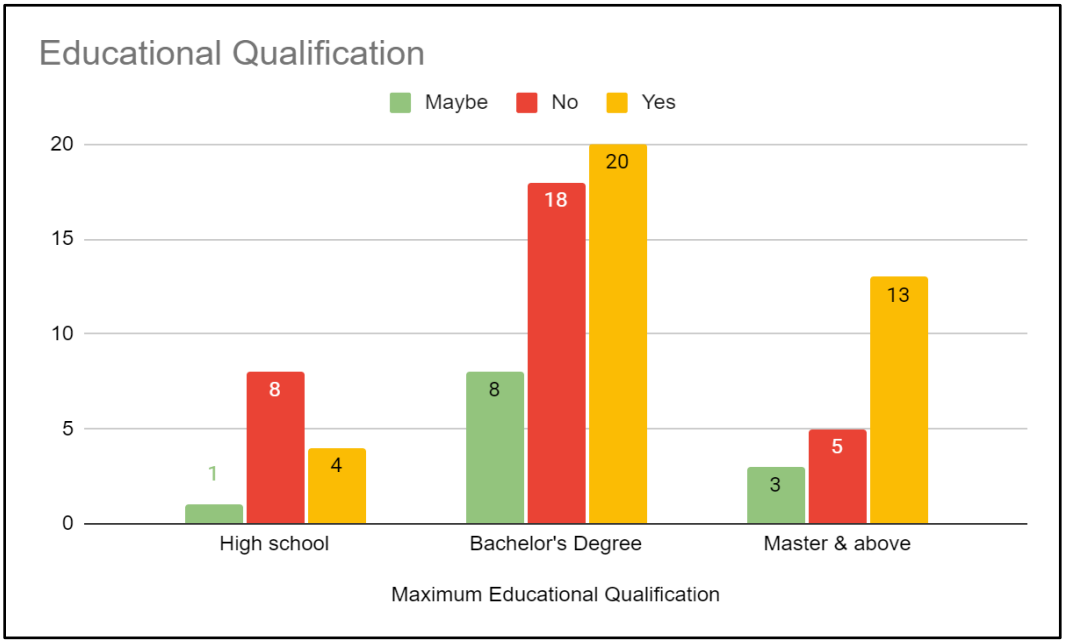
target of study. Anyhow, people of higher age have bigger pockets therefore they too affect the transition considerably but at the same time, they are less likely to adapt to a new change in technology especially related to money. It is the younger generation who switches the platform and adapts the technology much more easily.

FIG 5.2: e-RUPEE AWARENESS AMONG AGE



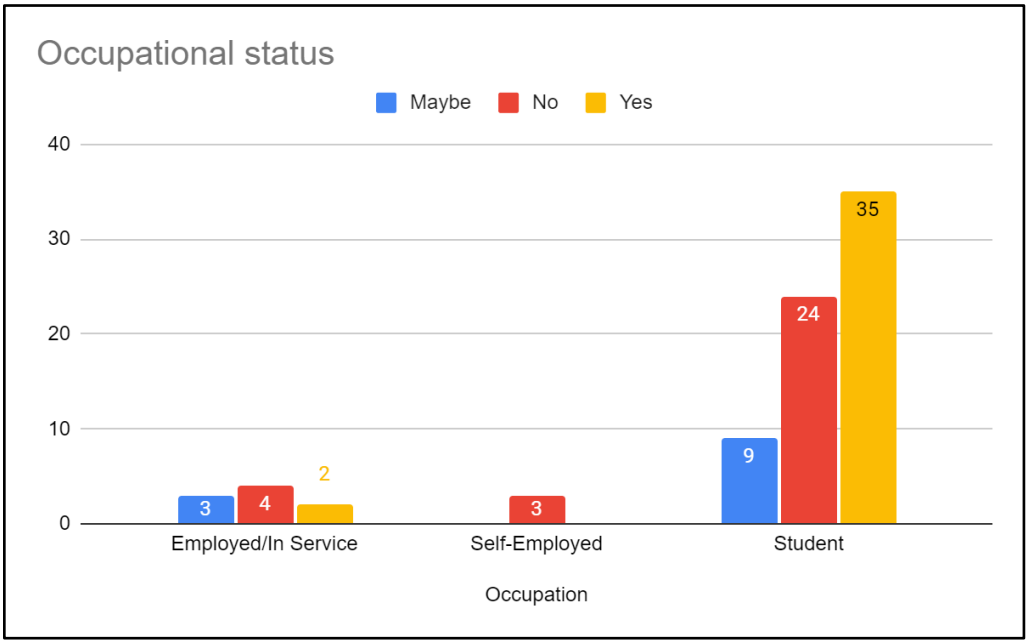
- The third specification is based on the educational qualification. Among high school graduates, 4 are familiar with India's e-Rupee, 8 are not, and 1 is unsure. Respondents with a bachelor's degree show comparatively higher awareness, with 20 familiar, 18 not, and 8 unsure. Those with a master's degree or higher have the highest awareness, with 13 familiar, 5 not, and 3 unsure. This indicates that awareness of the e-Rupee increases with higher educational qualifications. Bachelors having a larger share in the data set have the maximum number of people who are aware of the Indian e-Rupee.

FIG 5.3: e-RUPEE AWARENESS FOR VARYING EDUCATIONAL QUALIFICATION



- The final graph presents responses categorized by current occupation. Among employed individuals, 2 are familiar with India's e-Rupee, 4 are not, and 3 are unsure. Of those who are self-employed, none are familiar, 3 are not. Students show the highest awareness, with 35 familiars, 24 not, and 9 unsure. This analysis reveals that students are the most aware of the e-Rupee compared to employed and self-employed individuals. However, this should not be drawn as a conclusion as most of the respondents constitute to be students.

FIG 5.2: e-RUPEE AWARENESS ACROSS VARYING OCCUPATION



Once we have stated the major independent variables and their impact. We will now move on to the hypothesis testing. The very first null hypothesis states that H_0-*"There is no significant scalability and accessibility of e-Rupee among the general people."* In order to test this hypothesis, we have used logistic regression, with accessibility as a regressand and familiarity with the e-Rupee (ER_Fam_Y), its usage (DusingDC), people's educational qualifications (DBach, DmastersDoct), current infrastructure (Dinfrayes) and their financial literacy about different methods of payment (Ddiffupierupee_DK1) as regressors*[1]. As can be seen from the table, the usage of e-Rupee, basic education post-high school, current infrastructure, and financial literacy plays a significant role in the accessibility and scalability of the e-Rupee. 4 out of 6 variables have significant p-values, which means they have a deciduous impact on accessibility. They are significant at 1 and 5% levels of significance alternately. On the other hand, the remaining two variables which are familiarity with the e-Rupee and attainment of higher education (post-graduation and doctorate) have no significant impact.

DusingDC- Using a digital currency reduces the log odds of the accessibility of e-Rupee among the users. Likewise, the sixth variable which represents the overall literacy of the respondents, shows that it impacts the regressand inversely. On the contrary, basic literacy and appropriate infrastructure could increase the log odds of e-Rupee accessibility by 4.666 and 3.443 points respectively. Apart from this, the chi-square and the pseudo-R-square values show reasonable outcomes.

[1] * A detailed description of variables along with their nomenclature is attached at the end of the document at Annexure 1.a

TABLE 4: LOGISTIC REGRESSION 1

Logistic regression

DAccessibilityyes	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
ER_Fam_Y	.875	1.093	0.80	.423	-1.267	3.017	
DusingDC	-5.834	1.915	-3.05	.002	-9.587	-2.081	***
DBach	4.666	2.09	2.23	.026	.569	8.763	**
DMastersDoctorate	2.896	1.794	1.61	.106	-.619	6.412	
Dinfrayes	3.443	1.205	2.86	.004	1.082	5.804	***
Ddiffupierupee_DK1	-3.741	1.615	-2.32	.021	-6.905	-.576	**
Constant	-1.295	1.522	-0.85	.395	-4.277	1.688	

Mean dependent var	0.188	SD dependent var	0.393
Pseudo r-squared	0.571	Number of obs	80
Chi-square	44.113	Prob > chi2	0.000
Akaike crit. (AIC)	47.099	Bayesian crit. (BIC)	63.773

*** *p<.01*, ** *p<.05*, * *p<.1*

The chi-square value (44.11) assesses the overall model fit. The p-value (0.000) indicates that the model is statistically significant. The AIC and BIC values are 47.099 and 63.773 respectively. Therefore, observing all the major values from the table, we can conclude that there is a lack of scalability and accessibility of the e-Rupee in India, which has prevented people from using it. Hence, we can state that, we fail to reject the null hypothesis and the statement holds true.

4.1.2 HYPOTHESIS 2: There is no significant public acceptance of e-Rupee

In this paper, we have tried testifying to the public's opinion towards digital currency. We have already discussed that people often judge the security of digital currency and its reliability. Therefore, we will be here considering people's perception towards the change. The importance of financial development and digitization in driving economic growth and improving investment decisions is emphasized in this chapter. It points out how a centralized banking system can enhance a country's financial development. This objective seeks to examine the rise of CBDC using a grassroots approach, taking into account different geographical areas and diverse population segments in India. For the overall success of any new technology, people's acceptance and perception play a key role. Hence, this paper has targeted the localities. The chapter offers insights into the potential impacts of introducing a technology-focused system in a democratic country like India by analyzing themes related to CBDC awareness, acceptance, and challenges.
So, first of all, in the very first hypothesis, we tried testing the reach and inception of the e-Rupee. There we took various parameters and tested the major factors that were affecting the scalability of the currency. Now, we will move on to the next hypothesis which tests, whether the respondents from different corners of India are ready to wholeheartedly accept the e-Rupee at this point in time. As can be seen from the graph below, e-Rupee awareness is far reached. Almost 46.3% of the respondents agreed upon the fact that the Indian government has issued its own CBDC which is the e-rupee. The remaining 38.8% which is yet a huge number remained in denial while the rest 15.0% were unsure about such arrival. A substantial portion still lacks knowledge about it or remains uncertain. This again hints us at the fact that there is a huge unawareness about e-Rupee among the masses, even though its launch has marked its first anniversary.

FIG 6: e-RUPEE RECOGNITION AMONG PEOPLE

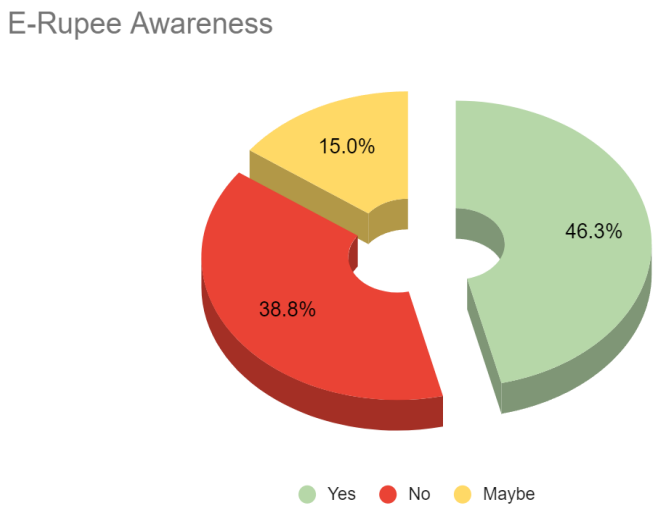
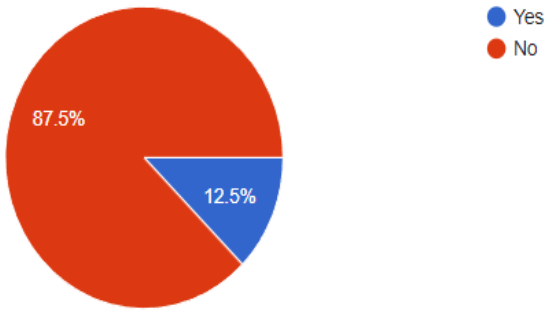


FIG 7: PERCENTAGE OF e-RUPEE USERS



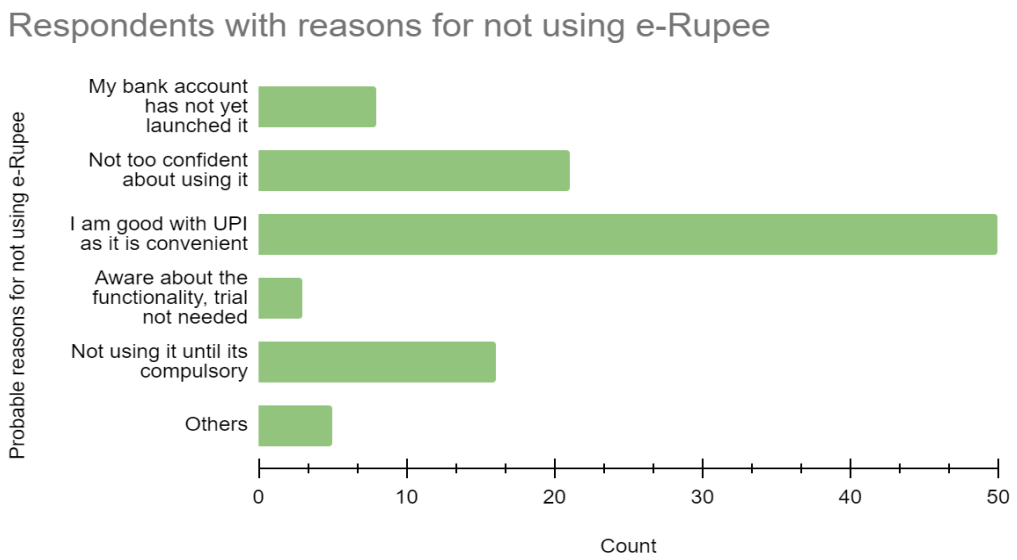
Although the count of respondents knowing about e-Rupee is more, when it comes to actually using it, the number is pretty low. Out of 80, there are only 10 people who have used it which accounts for 12.5% while the remaining 87.5% have not tried it yet. This low adoption rate highlights the need for increased awareness and education about the benefits and uses of e-Rupee. Out of these 10 people 7 have attributed that, there exists a difference between the e-Rupee and other forms of payment methods that exist currently. The change that they could observe was in terms of various notes that they could transact without any intermediary. They did mention that the exchange was seamless and similar to the cash transaction as the sender and the receiver get a uniquely numbered currency which gets deposited in the wallet when sent. Yet on the other side, some of the other views were that both the sender and the receiver should have their bank accounts in the banks that issue e-Rupee currently. We will get some insights from the table given below. Further, we have visualized the tabulated data in a comparative bar graph.

TABLE 5: REASONS FOR NOT USING e-RUPEE

Probable reasons for not using e-Rupee	**Count**	**Percentage**
My bank account has not yet launched it	8	11.10%
Not too confident about using it	21	29.20%
I am good with UPI as it is convenient	50	69.40%
Aware of the functionality, trial is not needed	3	4.20%
Not using it until its compulsory	16	22.20%
Others	5	7.00%

The table highlights that, almost as high as more than half of the respondents have vouched in favor that, they have not tried e-Rupee because they were comfortable using the UPI. They have

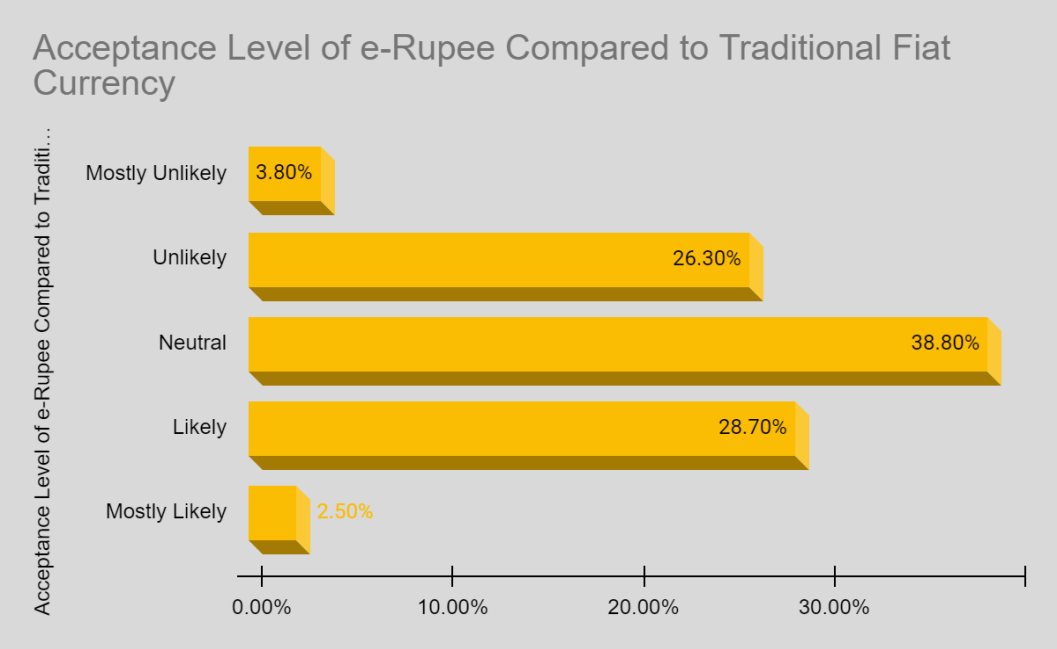
FIG 8: RESPONSES FOR NOT USING e-RUPEE



advocated its convenience. As has already been mentioned above, Indians do take time to adapt to new technology and specifically anything related to money. The reason lies behind its security, reliability and trust. 50 out of 80 people, which accounts for about 69.40% are not switching just because of a convenient alternative. The second major reason accounts for the lack of confidence in the system. Almost 29.20% of the people lack confidence in the e-Rupee. Another, yet surprising reason that came to notice was that people are not ready to use it until and unless it is made compulsory. This accounted for about 22.20% of the total sample surveyed. One of the remaining reasons that need a mention is the lack of the banks' participation. Till date, not all the banks of India have got the authority to issue the e-Rupee. Therefore, people have not got a chance to experiment and try out the same.

It becomes quite interesting to compare the level of acceptance that people have for the fiat currency and that of a newly launched e-Rupee. Although this fact should not be ignored that, the fiat currency is in use for years now and the e-Rupee has just launched. When the respondents were asked about the same, around 31.20% of them are likely that, e-Rupee would get a equivalent

FIG 9: PROSPECT LEVEL OF e-RUPEE ACCEPTANCE AS COMPARED TO FIAT CURRENCY



acceptance as the traditional currency. However, the percentage of those discouraging the fact is equally high, as they count to 30.10%.

Now, the second hypothesis, states that H_0- *"There is no significant public acceptance of e-Rupee".* Having seen the scanty users of the e-Rupee we can say that, firstly accessibility, then awareness and thirdly mass acceptance are the major drawbacks of the e-Rupee implementation. In the two tables below, we have presented the stata outputs for e-rupee usage. Here again, we have tooled the logistic regression model as both the regressor and the regressand are dichotomous in nature. In the first model, age, gender, educational qualification, occupation, accessibility and familiarity with the currency is examined. Here, as can be seen, only three out of seven variables are significant. Rest all the variables are not having any significant impact on the dependent variable, thereby violating our results. We have earlier noted that gender did not play much of a role here in this study, as we are considering the age group of 18-25. All three genders are equally likely to not be using and being unaware of e-Rupee usage. Hence, to get a better understanding, we have dropped the gender variable and re-ran the test.

TABLE 6: LOGISTIC REGRESSION 2

Logistic regression

Dcurruse	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Dage1825	-2.962	1.827	-1.62	.105	-6.544	.619	
DM1	.943	1.038	0.91	.364	-1.093	2.978	
Dstdnt1	.979	1.84	0.53	.595	-2.628	4.585	
DBach	-3.705	1.64	-2.26	.024	-6.918	-.491	**
DMastersDoctorate	-3.393	1.681	-2.02	.044	-6.689	-.097	**
DAccessibilityyes	4.331	1.514	2.86	.004	1.364	7.299	***
ER_Fam_N	-2.183	1.518	-1.44	.15	-5.158	.791	
Constant	.963	2.388	0.40	.687	-3.717	5.644	

Mean dependent var	0.125	SD dependent var	0.333
Pseudo r-squared	0.445	Number of obs	80
Chi-square	26.825	Prob > chi2	0.000
Akaike crit. (AIC)	49.458	Bayesian crit. (BIC)	68.514

*** p<.01, ** p<.05, * p<.1

In the second attempt, as the output shows, all the regressors became significant at different levels of significance, be it 10, 5 or 1% respectively. The only variable that could not show any impact on the dependent variable is the familiarity of the e-Rupee. This further proves our hypothesis that even though people know about the e-Rupee, they are hesitant and not open to using it. The value for the pseudo-R square is 0.431 while for the chi-square is 25.955, which is quite significant. The

overall fit represented by the probability distribution is again significant which shows that the test is significant and thereby the independent variables have a remarkable impact on the dependent variable. The AIC and BIC also remark significant values with 46.328 and 60.620 respectively.

TABLE 7: LOGISTIC REGRESSION 3

Logistic regression

Dcurruse	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Dage1825	-3.009	1.672	-1.80	.072	-6.286	.268	*
DBach	-3.604	1.552	-2.32	.02	-6.647	-.562	**
DMastersDoctorate	-3.406	1.674	-2.04	.042	-6.686	-.126	**
DAccessibilityyes	4.229	1.425	2.97	.003	1.435	7.022	***
ER_Fam_N	-2.422	1.473	-1.64	.1	-5.309	.464	
Constant	2.263	1.852	1.22	.222	-1.368	5.894	

Mean dependent var	0.125	SD dependent var	0.333
Pseudo r-squared	0.431	Number of obs	80
Chi-square	25.955	Prob > chi2	0.000
Akaike crit. (AIC)	46.328	Bayesian crit. (BIC)	60.620

*** p<.01, ** p<.05, * p<.1

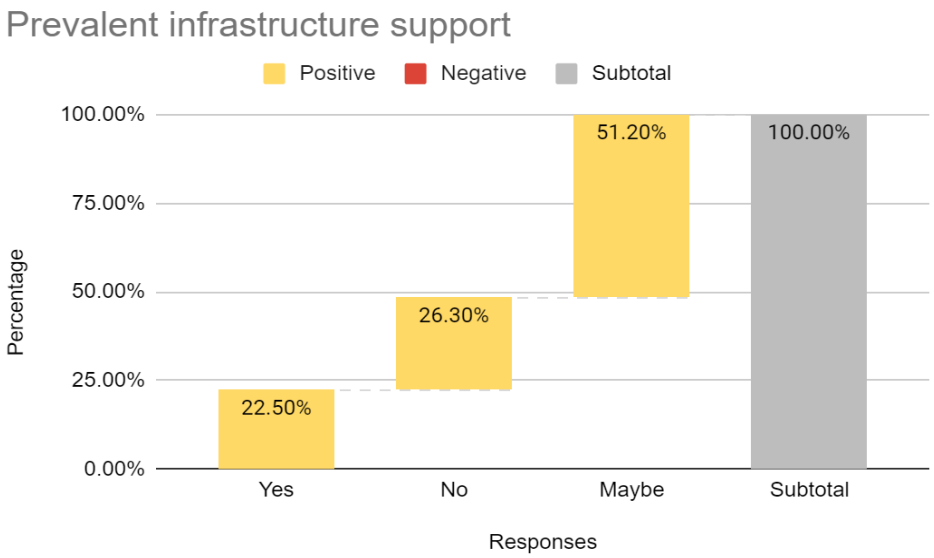
Considering all the parameters and the statistical inference we can conclude that, the second null hypothesis holds and therefore we fail to reject the second null hypothesis which is there is no significant public acceptance of the e-Rupee.

4.2 Results and Discussion

We have seen in the previous hypotheses that one of the prevalent apprehensions was the deficiency of confidence in the safety, dependability, and possible fraudulent aspects linked to the usage of e-Rupee. Furthermore, a lot of people were not completely aware of the features or advantages of the e-Rupee, which made them reluctant to switch from conventional cash-based transactions to digital ones. Concerns regarding privacy arise from users. They fear that their data might get breached which can ultimately cause safety issues. This may cause people to lose faith in these techniques. Infrastructure constraints may also prevent digital payments from being widely used. Having talked so much about its challenges and implementational problems, we have to look into, whether the centrally backed digital currency has any scope in India. Today, India's share in real-time digital payments is the highest, i.e. at 46%, the highest of all in the year 2022, as of ACI Worldwide and Global Data, 2023. Most of the research in the near past has accepted that Indians don't adapt to technological change that easily ("Why is India very slow to adopt digital transformation compared to other nations?" 2022).

e-Rupee or any CBDC of a country is launched with a lot of expectations to curb corruption, money laundering and reinstate reliability, credibility, trust and public faith. Apart from this, they aim at achieving a maximum acceptance among the public. Therefore, it comes with a lot of promises, but then, in a country like India, will and expectation drives the financial or any other decision in general. People's expectations for a positive change have many a times skyrocketed the financial market or any other fiscal or monetary policy. Hence, we are here going to testify whether any change has been brought about in the economy with the arrival of e-Rupee. In other words, we will be observing people's perception about any change that they might be expected out of this launch. To test this hypothesis, we have sketched out direct questions like marking their preferences on the liked-scale about the transparency and anti-corruption.

FIG 10: PERCEPTION ABOUT INFRASTRUCTURE SUPPORT



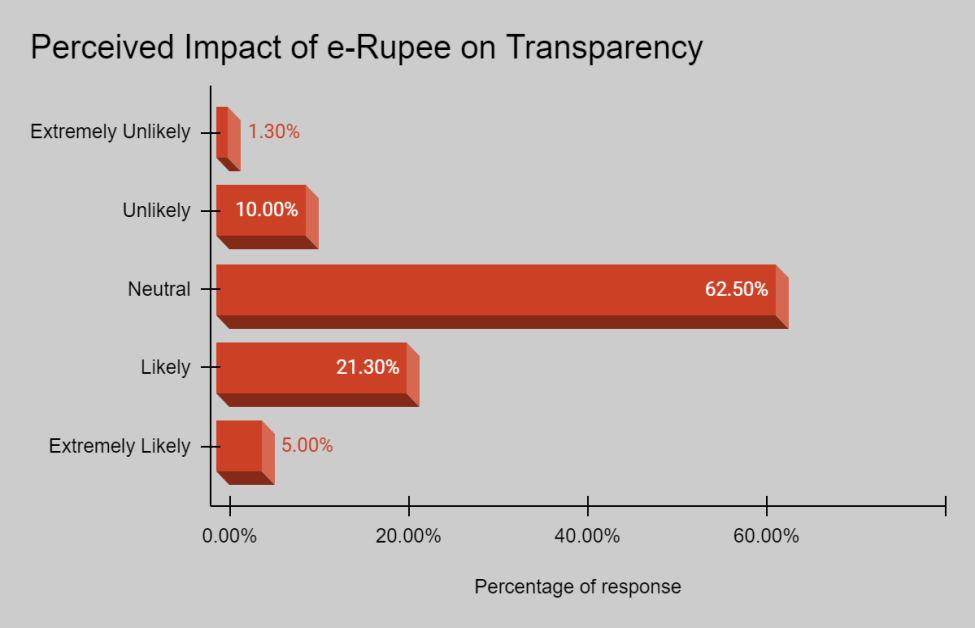
The above figure has represented the percentage values of the respondents who believe that there is adequate infrastructural support in the e-Rupee. There are only 22.50% of the people who have agreed upon this statement while 26.30% have disagreed and the majority has opted to remain neutral. It is the lack of infrastructure that acts as a barrier to the success of any new innovation. As can be inferred from the graph, summing up the uncertainty and the disagreement among the people, a total of 77.50% of the people believe that infrastructure is lacking behind.

Now, we will see how people perceived the impact of e-Rupee in the Indian Economy. The below graphical representation shows the response on the liked scale ranging from 1 to 5 as extremely unlikely to extremely likely.

TABLE 8: PEOPLE'S PERCEPTION ABOUT e-RUPEE BRINGING TRANSPARENCY

Liked Scale Measure	**Percentage**	**Count**
Extremely Unlikely	1.30%	1
Unlikely	10%	8
Neutral	62.50%	50
Likely	21.30%	17
Extremely Likely	5.00%	4

FIG 11: PEOPLE'S PERCEPTION ABOUT e-RUPEE BRINGING TRANSPARENCY



The above graph represents that the majority of population still have a daunting believe that there is not much that can be changed with the arrival of e-Rupee. This is evident from the neutrality bar which rise at the highest of 62.50%. However, if we ignore the neutrality among the masses, we can definitely say that, a total of 26.30% of the people are hopeful towards e-Rupee bringing in transparency in the economy.

On a concluding note, summing up all, we have seen that the current scenario of e-Rupee is engrossed with users' doubt, lack of faith in the system, scalability issues with lesser adoption and most majorly, lack of awareness and acceptability. In addition to these, ensuring consumer privacy and data breaches are some of the other prominent problems that were encountered and which is obstructing the smooth implementation. We have found out that, people have not been using e-Rupee because they were very comfortable with the UPI and they were lacking confidence in this new system of payment. The report also reveals that the majority of participants saw e-Rupee and UPI as rivals. It's true that UPI has gained a lot of traction as a payment method in India due to its quick acceptance and extensive use. It has contributed significantly to the faster adoption of digital payments in India, which makes it a platform that might potentially complement e-Rupee rather than compete with it. This combination would function as a far more efficient payment method, providing accessibility and immediate fund transfers.

5. The Prevailing International Outlook

5.1 USA

When considering the future acceptance of digital currency in different nations, it's natural to focus on the global powerhouse - the United States. Throughout history, the United States has consistently been a frontrunner in numerous areas and serves as a model for the future. Therefore, it's reasonable to assume that the nation will also take the lead in establishing clear and sustainable guidelines for cryptocurrency trading. The country has acknowledged the growing interest of its investors in digital currency and its potential as the future of the increasingly digital world. Consequently, various regulatory bodies have started formulating rules and regulations for digital currency. However, the intricate characteristics of digital currency made it challenging for Wall Street to establish a comprehensive regulatory framework for digital currency. The United States' intricate legal and tax system has made it difficult for regulatory authorities to clearly define or provide legal status to digital currency.[10] [(REVISTA GEINTEC-GESTAO INOVACAO E TECNOLOGIAS, 2021)].

Although the USA does not have its own CBDC, it allows various other decentralised digital currencies with many regulations and restrictions. Hence it becomes very challenging to regulate the usage and circulation of any decentralised currency. Therefore, India should mark its steps before the complete implementation. There have been 5 major regulating bodies.

1. Commodity Future Trading Commission
2. Financial Crimes Enforcement Network
3. Department of Justice
4. Security Exchange Commission
5. Internal Revenue Service

1. The Commodities Futures Trading Commission (CFTC) section focuses on how actively it enforces laws about Bitcoin exchanges that provide trading instruments based on Bitcoin. The involvement of the CFTC underlines the significance of regulatory supervision in the cryptocurrency sphere to safeguard consumers and uphold market integrity. It discusses the difficulties presented by future contracts on Bitcoin and leveraged trading, highlighting the possibility that US retail investors utilizing these platforms are breaking CFTC laws [11] (Commodity Futures Trading Commission. (2015)). It is made clear by the CFTC that American individual investors are only permitted to participate in off-exchange derivative products through designated channels, such as a regulated bank or a Retail Foreign Exchange Dealer (RFED) that is registered with the National Futures Association (NFA). The CFTC's regulatory approach to virtual currencies and Bitcoin is further demonstrated by its designation of these assets as commodities rather than foreign currency. [12] (Nelson, B. (2018)

Decentralised cryptocurrencies do not have a central issue in the sense that regulations apply to electronic money (the centralized one). The Electronic Fund Transfer Act (EFTA) regulates

electronic money as per Article 4A of the Uniform Commercial Code. The responsibilities of the electronic money issuer and the consumer when using electronic money are specified in Regulation E of this act. The government has mandated that basic system information has to be publicly available to boost consumer trust in electronic money systems. Issuers of electronic money are required by state law, 12 U.S.C. 1831t, and the EFTA to provide certain information.
1831t.

2. A section in the Financial Crimes Enforcement Network, also known as FinCEN, emphasizes how actively the federal government regulates virtual currencies. Administrative rulings related to virtual currencies available online have been issued by FinCEN, emphasizing the requirement for businesses facilitating Bitcoin transactions to obtain money transmitter licenses. It says that customers and companies involved in the cryptocurrency ecosystem are subject to the Bank Secrecy Act (BSA), which mandates registration with FinCEN as a Money Service Business (MSB) and adherence to Know-Your-Customer (KYC) and anti-money laundering (AML) laws. In an effort to stop illegal financial activities and maintain market openness, FinCEN's guidelines make clear what regulatory requirements exchangers and cryptocurrency administrators must meet. [13] (Reyes, C. L. (2016))

3. The Department of Justice has been actively involved in the prosecution of cases on blockchain technology and cryptocurrencies. It brought charges against people who were engaged in drug trafficking and virtual currency transactions. To address enforcement concerns in the realm of digital currencies and highlight the significance of regulation, the DOJ also hosted summits and seminars. To further emphasize its efforts to prevent tax evasion and guarantee compliance in the cryptocurrency sector, the DOJ also issued a "John Doe" summons to Coinbase, Inc., the biggest cryptocurrency exchange, requesting information on individuals making transactions in virtual currencies [14][Hughes, S. D. (2017)].

4. The Securities Exchange Commission (SEC) has been investigating cryptocurrencies and blockchain technology since 2014, focusing on potential securities violations in the industry. It charged companies for offering unregistered securities denominated in Bitcoin and issued advisories warning about fraudulent schemes targeting Bitcoin users. The suspension of listing trust shares of the Winklevoss Bitcoin Trust was caused by the massive uncontrolled Bitcoin markets, which were brought to light by the SEC's rejection of the Winklevoss Twins' Bitcoin Trust Exchange Traded Fund (ETF). The SEC's actions underscore its commitment to protecting investors and maintaining market integrity in the evolving landscape of cryptocurrencies.

5. For those who mine virtual currency as a trade or business, the Internal Revenue Service (IRS) categorizes gains from investments as a subject to self-employment tax and capital gains tax. Since virtual currencies are regarded as property for federal taxation, taxpayers must report transactions in US dollars and calculate their fair market value. The IRS guidance covers companies that accept cryptocurrencies in exchange for goods and services. It highlights that these companies must pay income taxes on the cryptocurrencies they accept and adhere to reporting regulations regarding

virtual currency property transactions. The IRS also works with the Department of Justice to find cryptocurrency users who are avoiding paying income taxes on their gains. This highlights the efforts made to guarantee compliance and deal with the tax implications associated with the cryptocurrency market [15] (Clements, R. (2021)).

The Uniform Regulation of Virtual-Currency Businesses Act (URVCBA), which was created by the Uniform Law Commission in 2017, provides a framework for laws governing companies engaged in "virtual-currency business activity". [16](Hubbell, Z. (2019)). "Exchanging, transferring, or storing representations of value within online games for virtual currency or legal tender" is defined by law as a virtual-currency commercial activity.
As per the URVCBA law, exchange, transfer, and storage of virtual currency, hoarding precious metals or certificates of electronic precious metals, and exchanging digital representations of value within online games for virtual currency or legal tender are all considered virtual currency activities. The distinctive three-tiered structure of the URVCBA makes evident whether a person or company involved in virtual currency business activity is (1) exempt from the act; (2) must register; or (3) must obtain a license. The URVCBA also contains numerous consumer protections. The model legislation is exceptionally composed effectively and allows virtual currency companies precise guidance on how to do business. Rather than depending solely on outdated money transmitter rules, states must consider implementing the URVCBA. Market stakeholders, regulators, and the courts can all clearly comprehend the detailed legal instructions the URVCBA provides.

5.2 Japan

Japan is a global leader in innovation because of its long history of inventing cutting-edge technology, including robotics and pocket calculators. The nation's desire for advancement also extended to cryptocurrencies, of which it is now the second-largest user base behind the United States. Japan, a country of about 127 million people, has a notable adoption rate of 11% of its population actively engaging in digital currency transactions. In spite of obstacles such as the Mt. Gox hack, which resulted in the theft of Bitcoins valued at millions of dollars, Japan adopted a proactive stance towards the regulation of virtual currencies. Rather than outlawing it, the nation decided to codify cryptocurrency investments and enact user protection regulations. Through the legalization of digital currency, Japan made it possible for its people to transact with cryptocurrencies in a safe and legal manner. A committee was formed in 2014 with the goal of making recommendations for improving the security and effectiveness of cryptocurrency operations in Japan. The government's commitment to creating a secure environment for transactions involving digital currency was demonstrated by this initiative. In order to protect users and stop fraudulent activity in the digital currency market, Japan imposed restrictions, such as outlawing private digital currencies in 2018. [24] (Yanagawa, N., & Yamaoka, H. (2019))

The Bank of Japan's working paper series titled as “Digital Innovation, data revolution and Central Bank Digital Currency”, discusses the implications of Central Bank Digital Currencies (CBDCs) on the financial landscape. It draws attention to the possible dangers of CBDCs displacing other payment methods, impeding innovation, and changing how data is used. In order to optimize the advantages of digital technologies for economic welfare, the paper highlights the significance of striking a balance between fostering innovation and ensuring the security of payment infrastructure. In order to optimize payment infrastructure design, it proposes investigating a variety of technologies and service providers. The paper further explores the changing relationship that exists between money and data, highlighting the growing role that information plays in economic transactions. It talks about how businesses are using payment instruments to gather consumer data and how this data-driven strategy will affect money and payment instruments in the future, including CBDCs. The document also discusses the factors to be taken into account when putting CBDCs into practice, including how they will affect commercial banks, the balance sheets of central banks, and the competition from digital payment instruments issued by banks. Ultimately, the study emphasizes that in order to successfully navigate the challenges of CBDC implementation in the digital age, meticulous analysis and strategic planning are essential.

Other countries navigating the changing cryptocurrency landscape can learn from Japan's approach to regulating digital currencies. Japan established itself as a leader in the blockchain era by finding a balance between innovation and regulation. The nation's proactive approach to regulating digital currencies not only serves as a model for other countries, but it also emphasizes how crucial it is to put strong regulatory frameworks in place in order to promote a secure and dependable environment for these kinds of transactions.

5.3 China

China, which at first arose as one of the biggest cryptocurrency trading platforms, has been a major player in the market for digital currencies. In a 2013 circular, the government defined cryptocurrency as virtual currency and cautioned investors about the inherent risks while allowing unrestricted market participation. But in 2017, the Chinese government declared an outright ban on trading digital currencies, citing risks to the financial system and a lack of laws protecting investors.

The global cryptocurrency market was severely impacted by the ban, with 40% of transactions coming from China. Large operators were shut down, and it was declared unlawful to use digital currencies for fundraising. The market's operations were essentially shut down when the government suspended the operations and licenses of exchanges involved in cryptocurrency transactions. China has launched its own digital currency, backed by strict guidelines established by the People’s Bank of China (PBOC), despite the country's ban on trading cryptocurrencies. China is positioned as a leader in the blockchain era if this digital currency had legal validity similar to that of the Chinese Yuan. China's position on digital currencies, however, is unclear

because it seems to be both in favor of and against their use. China is committed to upholding control over financial markets and safeguarding investor rights, as evidenced by its regulatory approach to digital currencies. The nation's stringent regulations are designed to guarantee adherence to central bank directives and reduce the financial risks connected with cryptocurrencies. China hopes to become a market leader in digital currencies while keeping regulatory control and by issuing its own digital currency. China's ban on the trading of digital currencies had a profound effect on the world economy, causing a sharp decline in the value of Bitcoin in Chinese Yuan. China's cautious approach towards emerging financial technologies and its emphasis on investor protection were underscored by the ban. China, with its own issue of digital currency has presented model for other nations to follow [25] (Allen, F., Gu, X., & Jagtiani, J. (2022)). The China's e-CNY is an account and token based non-interest-bearing instrument that is currently in circulation in China. It is a hybrid ecosystem as there is a central ledger which is compatible with all DLT frameworks that intermediaries might choose to use. Secondly, it facitlitates software and hardware wallet depending on the carrier. Software wallet provides services through APIs, software development kits and hardware that uses security chip. Digital certificate, signature and encrypted storage is provided in order to avoid any misuse. The e-CNY support financial inclusion and need for digital cash. Its reduction in friction among other payment platforms. Apart from this, it counters the popularity and risks posed by cryptocurrencies. To sum up, China has implemented a variety of regulatory measures pertaining to digital currencies, including warnings, bans, and the possible issuance of a state-backed digital currency.

5.4 Nigeria

Nigeria is among one of the other nations that has its own centrally backed currency called e-Naira. It is the first African country to issue a central bank digital currency (CBDC) or fiat digital currency. Nigeria has benefited from the CBDC in a number of ways, including better financial policy transmission, more effective payments, and greater financial inclusion. Conversely, a number of dangers have been noted, including growing levels of digital illiteracy, increased susceptibility to cyberattacks, data piracy, and a vague stance of banks in a fully evolved CBDC economy. Even with all of these potential consequences, CBDC fixes more issues than it creates. The Central Bank of Nigeria is able to learn from the risks as it presents and enhances its CBDC protection capabilities, making it more effective and better suited for the Nigerian economy [26] (Ozili, P. K. (2022)). The e-Naira is the account based non-interest-bearing instrument, with the same DLT technology as some of the crypto currencies, so that they can be stored in digital wallets. The currency is a hyperledger fabric variant of DLT for enterprise users with robust security architecture. It gives stringent access rights controls to the central banks. The minting and issuance is with central bank. Intermediaries only ensures the distribution through digital wallet platform which has a certain transaction limit depending on the risk factor. The transaction information, if required is only shared with the governmental authorities. The major objective of the government

is to enable households and businesses in order to accelerate payments through reliable, resilient and innovative means.

6. Conclusion

The paper in detail discussed the current scenario of the Indian financial system and the introduction of e-Rupee into it. It examined the inception, accessibility, scalability and acceptance among the youth of age group 18-25. It further confronts the major obstacles faced during the adoption. This paper has witnessed the common perception that persists in the economy. However, the document also supports many nations' positions about the recognition and regulation of digital currencies as a component of their legal and financial systems. These results significantly contributed to our understanding of the direction that digital currency is taking. In this paper, we went into great detail about the strategies and legislative changes that have been implemented in a few nations to help investors trade these currencies more safely and reliably and to prevent exchanges from engaging in dishonest business practices like money laundering, terrorism, etc. We discovered that certain nations have creative approaches to legislative changes and are managing the trade of virtual currencies well. The paper also discussed the stand of India towards the implementation of e-Rupee.

In regard to the most recent phase-out of the INR 2000 denomination banknote, e-Rupee may just be the right currency for financial transactions that the nation needs to usher in more trust, resilience, and efficiency in currency management. If the potential implementation challenges are addressed, e-Rupee could increase the ease of doing business by overcoming geographical barriers. As we all know, cash usage has declined significantly in the past few years, paving the way for the emergence of alternative currencies and modes of payment that are generally decentralized. Yet, the rollout of e-Rupee represents a significant advancement in India's efforts towards digital transformation. As, a result, e-Rupee can provide the financial and environmental stability that accompany innovation and financial inclusion in general in this particular setting.

7. Recommendations

The target of this study has not only involved observing the inception, awareness and public acceptance of the e-Rupee, but is also to thoroughly reviewing every economy that has diligently embraced digital currencies, and outlining how the e-Rupee will develop in India going forward and what structural and political changes would be required to make that happen. The post-lockdown situation has kickstarted a discussion about the potential use of the e-Rupee, which uses blockchain technology to provide secure monitoring and reporting, to address issues like money laundering, tax evasion, and banknote counterfeiting. People have hoped that, a national digital currency, would make it easier to track down illicit activity and eliminate problems that plague our economic reality. This has also been highlighted in the primary survey. The Reserve Bank of India have acted with assurance but should further their steps with caution, based on the masses firm belief. Innovations in blockchain technology-based solutions that provide the benefit of tracking different illicit economic activities that damage the Indian economy must be implemented with caution. As we have already seen, very few people are aware of the e-Rupee and out of which a handful of them trust it. There have been many countries that have either set up regulations on digital currencies i.e., cryptocurrencies like Bitcoin, Ethereum, Litecoin (USA, Canada) or have launched or are planning to launch their own centralized digital currency like China, Nigeria, India, Korea, Russia, Sweden. From creating centralised ledgers, maintaining records with the respective commercial banks, monitoring transactions, and holding digital certificates or assets, to the specified usage of the currency, discounting value and setting up of regulatory bodies were some of the remarkable steps.

In India, it is evident that in order to fully realize the advantages of financial inclusion and the simple adoption of digital currency, the government and CBDC implementing agencies should make sure to reach the unreached population, particularly in Tier-2 and Tier-3 cities with adequate technology infrastructure. They should also regularly hold awareness and orientation campaigns. In the section on CBDC and financial stability, the effect of CBDC on financial system stability is examined. It investigates how the introduction of CBDC can change the dynamics of liquidity provision, interest rates, and deposit competition between commercial banks and central banks. In particular, the section points out that CBDC could decrease the availability of private credit, resulting in higher nominal interest rates and lower reserve-deposit ratios for commercial banks. It underscores the significance of maintaining equilibrium conditions for commercial banks to ensure stability in light of CBDC implementation [27] (Kim, Y. S., & Kwon, O. (2023)). As an account-based legal tender that is universally validated across locations, claims on interest-bearing CBDC are not susceptible to restricted communication issues. A commercial bank's reserve-deposit ratio falls when deposits are made into a CBDC account because it effectively reduces the amount of private credit that commercial banks are willing to provide. This boosts the nominal interest rate. Because there is a greater chance of a bank panic, where commercial banks run out

of cash reserves to pay out to depositors, this has a detrimental impact on the stability of the financial system. However, a rise in CBDC that does not need reserve holdings might improve financial stability by basically increasing the availability of private credit and lowering the nominal interest rate once the central bank is able to lend all of the deposits in CBDC accounts to commercial banks. This was the overall picture of the monetary health of the economy.

Now we finally delve into the key considerations regarding e-Rupee. Apart from the primal considerations like enhancing anonymity, data privacy and fraud protection, the authority should focus on scaling up the central infrastructure. Therefore, when the number of transactions inside a given framework rises, the emphasis should be placed on modular DLT design. Along with this, operational efficiency should also be catered by expanding computing capacity through setting rules or the distribution of layers and thereby letting the ecosystem freely work. Additionally, banks and non-banks must build key value propositions in order to construct a joint CBDC portfolio. Access-based services, user apps, e-wallets, and processing support are crucial areas to concentrate on. These were a few of the main suggestions made by the previously mentioned study.

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[6] Author links open overlay panelMd. Asraful Haque, Highlights•The launch of digital currency in India (e₹) could have a significant impact on the country's financial sector.•The adoption of e₹ requires adequate digital infrastructure and regulations to ensure its safety, & AbstractThe Reserve Bank of India (RBI) has recently launched the country's first pilot project for the digital currency known as the digital rupee or e-Rupee (e₹). The launch of the digital rupee represents a significant advancement in the "Digital India. (2023, May 4). *E₹-the digital currency in India: Challenges and prospects*. BenchCouncil Transactions on Benchmarks, Standards and Evaluations. https://www.sciencedirect.com/science/article/pii/S2772485923000248#b1

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10. Appendices

10.1 Annexure 1

Questionnaire

PART-1

1. Which part of India do you reside in?
    1) North
    2) North East
    3) South
    4) South East
    5) East
    6) West
    7) Southwest
    8) Northwest

2. What is your Age?
    1. 18-25
    2. 26-35
    3. 36-55
    4. 55 and above

3. Gender
    1. Male
    2. Female
    3. Third Gender
    4. Prefer not to say

4. Maximum Educational Qualification
    1. High School/ Equivalent
    2. Bachelor’s degree
    3. Master’s degree
    4. Doctorate

5. Occupation
    1. Currently out of work
    2. Employed
    3. Student
    4. Retailer/wholesaler
    5. Self-employed

PART - 2

6. Do you know about digital currency?
    1. Yes/No

       Select as many as you know:
        1. Bitcoin
        2. Ethereum
        3. Litecoin
        4. Dogecoin
        5. Binance
        6. e-Rupee

7. Have you ever heard of the e-Rupee of India?
    1) Yes
    2) No

8. Have you ever used e-Rupee?
    1. Yes
    2. No

8.1 If yes, did you find anything different from other existing payment methods?

8.2 If no, Why have you not tried using e-Rupee?
    1. My bank account has not yet launched it
    2. I am not too confident about it
    3. I feel I am good with UPI as it is much more convenient
    4. It's not something very new that needs a trial
    5. I am not going to use it until is under compulsion.
    6. Others_____

9. Do you think it is as easily accessible as UPI?
    1. Yes
    2. No

10. Is there a difference between UPI and e-Rupee?
    1) Yes
    2) No

11. How likely do you believe the e-Rupee has brought or will bring about transparency and more credibility in the Indian economy?

12. To what extent do you agree with the following statement:
"The e-Rupee will achieve an equivalent level of acceptance as traditional fiat currency".

13. On a scale of 1 to 5, what do you think how likely it is that the e-Rupee will bring transparency in a huge economy like India?

14. Can you think of any one way in which e-Rupee can help reduce corruption and bring transparency?

15. Can you think of any one challenge which is baring the smooth implementation of the e-Rupee?

10.2 Annexure 1.a

Units	Symbols	Variable Description
1.	DAccessibilityyes	Dummy for Accessibility (accessible-1)
2.	ER_Fam_Y	Dummy for e-Rupee familiarity (Yes-1)
3.	DusingDC	Dummy for using digital currency (Yes-1)
4.	DBach	Dummy for education till Bachelor's
5.	DMastersDoctorate	Dummy for higher education (PG+Doctorate) (Yes-1)
6.	Dinfrayes	Dummy for people's perception about appropriate infrastructure (yes-1)
7.	Ddiffupierupee_DK1	Dummy for perception about difference between UPI and e-Rupee
8.	Dcurruse	Dummy for e-Rupee usage
9.	Dage1825	Dummy for age (age 18_25-1)
10.	DM1	Dummy for gender (Male-1)
11.	Dstdnt1	Dummy for occupation (student-1)
12.	Constant	The intercept value