

FUNCTIONAL AWARENESS OF DIGITAL RUPEE: EMPIRICAL EVIDENCE FROM A METRO CITY IN INDIA

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Abstract

In this era of digitalization, the Central Bank has revolutionized to overcome borders and adopt new technologies, which could improve the cash cycle of the economy, which has to be faster in circulation. This study attempts to understand the level of awareness among the people in Bengaluru City about the functions of the Digital Rupee. 200 respondents were surveyed and their level of awareness was analyzed with various statistical tools. The results show a significant relationship between the age group and respondents favoring a cashless economy. Younger adults would want to avoid carrying their physical wallets and would want just their phones to help in carrying out transactions. Hence, it can be inferred that these younger adults have a positive approach towards the country going cashless. The expected functionality of the digital rupee is predicted to fulfill the public's transaction needs. However, it can be said that the concept of digital rupee has reached a good amount of audience via various channels.

Keywords: Digital Rupee, Block Chain Technology, Digital Wallet, Cashless Economy, digitalization, cash cycle.

Introduction

The need for cash alternatives in India has arisen due to the increased acceptance of digital payments. By minimizing the paper-based currency culture, the country can be more transparent and efficient in its economy. The use of blockchain technology has led to the introduction of blockchain currency. The eradication of hard cash cannot be done completely without the public's mindset and their choice of preference. In the banking sector, the buzz right now is on Digital trends. The growth in online transactions has significantly become one important reason for this industry to adopt new technologies parallel to following customer behavior trends. Some of the general areas focused on the economy are to support these digital payments, improve user interface, provide better customer support and also bring in the use of Machine Learning (ML) and Artificial Intelligence (AI). It is right to say that as a part of these digital trends, the concept of digital currency has come into existence.

About Digital Rupee: The term **Digital Rupee** is the digital form of currency notes issued by the Central Bank of India. It is an electronic form of cash that can be used for transactions. It is a legal tender in a digital form and hence is highly centralized. The digital rupee is also known as **e-rupee (e-₹)** or **Digi-rupee** which is a part of Central Bank Digital Currency (CBDC). It is issued in the same denominations as the paper currency and coins that are circulated now. It is a form of money, but instead of hard cash it is in digital cash, the wallet attached to making the transactions is also in a digital form that is a **digital wallet**. Typically, these rupees do not require any intermediaries for the transaction to take place and are a very cost-effective way to transfer money.

How does a Digital Rupee work?

The digital rupee is power backed by the blockchain technology. *Blockchain technology is an advanced database mechanism that allows transparent information sharing within a business network. A blockchain database stores data in blocks that are linked together in a chain.* With this blockchain network, these currencies are created and used as a feasible form of money transfer. As per the RBI, **the digital rupee will be stored in a digital wallet which is accessible by the user on their mobile phone and other devices as well.** These transactions include both types; Person to Person (P2P) and Person to Merchant (P2M). These transactions can happen with the help of a QR code which can be generated on the spot with the exact value amount for the payment. This feature of the QR code is kept because the public is already familiar with this form of payment and is much easier to transact. Once the QR code is scanned the person can enter the exact amount to be paid to another person or merchant and send money. In case the person does not have an exact change for the value to be sent, they can also receive back the tendered amount. The payment can also be made by entering the phone number of the other person or the merchant and then carrying out the transaction.

Implications of Digital Rupee

The previous research done in this area has found many challenges. Though the currency is going to be introduced on one platform, the risks associated with it have to be considered. Risks related to operations, monetary and financial concerns. The global aspects also have to be cleared which can help in boosting the border payments security. Digital currencies have the highest security but the main game is to get the acceptance of the general public.

Another way of identifying the implications of the digital rupee can be seen through how the other countries have adopted digital currencies and how far was it a success. Countries like The Bahamas, Nigeria, Russia, Sweden and China have adopted digital currencies in their

forms. In total, 11 countries have launched their digital currencies to date while 144 countries are doing the trial and exploring this concept. Some of the countries could not go far ahead with their digital currencies, and countries like Denmark and Finland could not adapt to their digital currencies due to public opposition and lack of support from the population of the country. As a result, they had to discontinue and reject the idea of introducing and adopting digital currencies.

Literature Review

According to (Nandi, 2022), there are retail uses of CBDC in India and hence the paper focused on the technological fundamentals of digital bank notes, situating this in the Indian economy perspective and identifying the legal and regulatory considerations. A similar study was conducted by (Santhosh & Kumar Raj, 2022) explaining the rise in digital currencies which is impacting the economy and what possible implications these could bring to a country like India. (Bibhu Dash, Meraj Farheen Ansari, Pawankumar Sharma, & swati swayamsiddha, 2022) Opined that the evolution of 5G mobile technology would enhance peer-to-peer transactions with the uniqueness of the digital rupee. The study showed the internet usage trend across the world, blockchain and cryptocurrency adoption and challenges and compared it to the launch of digital rupee.

(Peterson K. Ozili, 2023) Explored the digital rupee with its benefits and issues concerning CBDC in India. The study proposed that before the process of implementing the e-rupee in India, the government will have to look into the legal and regulatory changes. An article by (Sashi Sivramkrishna, 2022) talked about how the digital rupee was being proposed in the Budget and that India too sees it as a good growth for the economy and how it could change the working of a monetary system. Another similar article written by them focused on the perspective of how banks could enhance their effectiveness of monetary policy with usual lending and borrowing functions.

Various other studies delved into the introduction and ways of implementation of the Digital rupee in our economy. (Deepansh Bhati, 2021) The study of this paper found out that India would move towards a less-cash economy and give importance to data security as it is a major concern towards going to a cashless economy. Another study done by (Dr Victor Saha & Dr Sunil George Mathew , 2022) highlighted the fact that cash remains the ruling mode of payment, even in the presence of UPI. So digital rupee has to be introduced into this system to minimize cash transactions. The general aspects of UPI have also been shown as a basic digital payment mode. The role of RBI in this whole process of introduction of Digital rupee

was seen in the study by (Aparanji, 2022) where some theoretical background of the recent developments in Indian digital evolution was highlighted. In conclusion, they stated that India being a diverse country would give a platform for the e-rupee to be introduced and could be accepted by the public.

Another study by (Gabriel A. Ogunmola & Ujjwal Das, 2024) investigated cognitive beliefs and affective beliefs in shaping user's adoption intentions. Key findings of this study revealed that perceived usefulness, ease of use, trust, self-efficacy and awareness positively influence users' attitudes and adoption intentions towards the digital rupee, while perceived costs negatively impact these factors. (Darsana Venugopal, 2024) The research highlighted gender and income disparities in digital rupee awareness, emphasizing the need to address these issues to enhance financial inclusion. Interestingly, technological deployment does not directly correlate with higher adoption rates, suggesting that further studies have to be made in this area.

(Kirti Khanna, Savita Ruhlan, Divya Yadav, & Dana Léo Paul, 2024) The research explores retail customer adoption patterns through selected banks. Findings indicate that various factors significantly influence behavioral intentions and the use of CBDC's providing insights into the determinants of digital currency adoption. (Nir Kshetri, 2024) The study enlightened the benefits of digital currency in comparison to Asian countries and identified that the policymakers will have to give specific importance to the blockchain-based WCBDCs (World Central Bank Digital Currencies). Accordingly, they will have to plan in terms of technical and personnel resources to reap the benefits provided by these digital currencies. Hence, in summary of this study, Asia is at the forefront of WCBDCs development which shall sooner or later increase cross-border transactions. (Sunil Patel & Himanshu Barot, 2023) The literature highlighted the challenges associated with the implementation of the e-rupee. Furthermore, the study necessitates a significant investment in technology infrastructure and cyber security measures to ensure the –rupee's security. (Md. Asraful Haque & Mohd Shoaib, 2023) the study highlighted the significant impact the digital rupee can make on the country's financial sector and to what extent the adoption of adequate digital infrastructure and regulations have to be set up to ensure reliability and safety for the public. They focused on setting the operational mechanism to meet the global standard and a similar study was conducted by (Dr. Nannaware M. K. , 2023) where they pointed out that India is on track to become the largest digital country in the world.

(Harshvardhan Govind, Aditi Nayan, & Priya Gupta, 2024) The study focused on the impact of digital payment systems in urban Patna. Analysis of how digital payment systems like e-rupee and UPI were used in the city and then examined the level of convenience, efficiency and security provided by these systems. Further insights for policymakers were also given in the digital finance landscape. The digital rupee might show some hindrance due to the lack of technological infrastructure as highlighted in the study by (Wenxuan Ma, 2023) and this would probably affect the population's educational level for CBDC in India. An exploration of the impact of good policies and possible risks faced in the introduction of the e-rupee were also highlighted in the studies carried out previously. The research conducted by (Shyamal Vyas & Dr Rupal N Patel, 2023) explored the key dimensions of public awareness regarding the RBI's Digital Rupee and touched upon the areas of its existing knowledge among the public, its purpose, benefits and concerns. (Deb, 2024) The study attempted to critically assess the possibilities of success of the recently launched Digital rupee in the Indian context. The findings revealed that the digital rupee could likely be a game changer in a country like India.

Research Gap

Despite the growing adoption of digital payment systems like UPI in India, there is a significant reliance on hard currency. Past efforts like demonetization had a limited impact on shifting the public's mindset towards a cashless economy and the strong emotional attachment to hard currency remains. Although the COVID-19 pandemic has accelerated digital payment adoption, the overall acceptance and awareness of the digital rupee as a viable alternative to physical currency have not been comprehensively studied.

Conceptual Framework

Based on the previous literature studied, the researcher has conceptualized the framework (Fig. 1.1) focusing on Perceived Functions and Awareness of the Digital Rupee, which is identified as a Dependent variable. Three Independent variables have been identified namely, age, gender and monthly income.

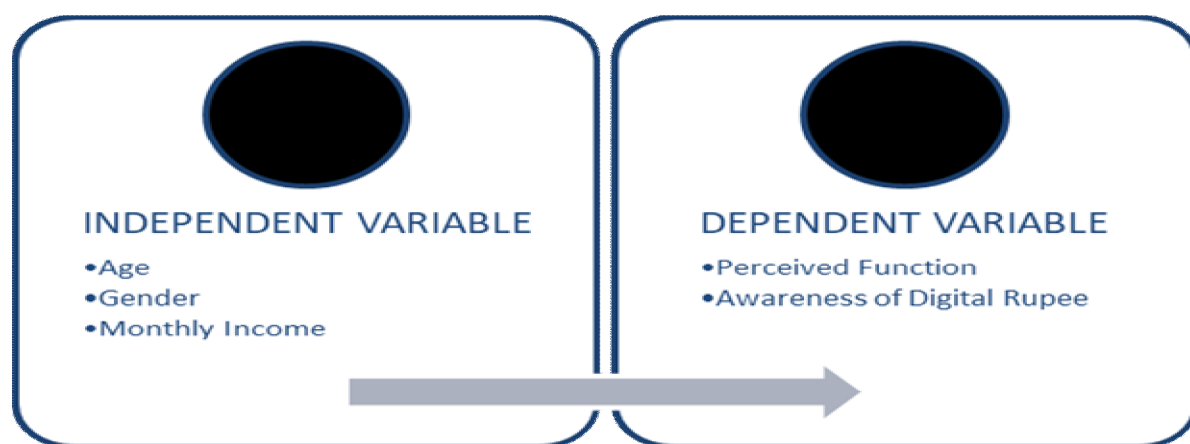


Fig. 1.1 Conceptual Framework

Statement of problem

The primary challenge is to understand the potential of the digital rupee to transform India's economy by reducing the dependency on hard currency. This involves evaluating its attributes, public perception and level of awareness to determine whether the digital rupee can effectively address the practical and emotional factors that currently favor cash transactions.

Research questions

1. What is the current level of awareness and understanding of the digital rupee among the general public?
2. How do demographic factors such as age, gender, education and occupation influence the acceptance and adoption of the digital rupee?
3. What are the perceived benefits and drawbacks of the digital rupee compared to traditional hard currency?
4. To what extent can the digital rupee reduce the costs associated with hard currency management and contribute to an eco-friendly economy?

By addressing these questions, the study aims to provide a comprehensive understanding of the potential impact of the digital rupee on society and the economy, highlighting the steps needed to foster a smooth transition towards a cashless economy.

Research Methodology

This research was conducted to study the functional awareness of digital rupee. The review of the literature above gave an outlay of the studies done in this area before and gave a deeper understanding of this topic.

Research Philosophy

The research philosophy of this paper is a mix of positivism and interpretivism. It is preferred to the quantitative methods which were used; a structured questionnaire and official statistics to get a good reliability while also collecting qualitative data through group discussions/interviews. In this research, we tend to look for relationships or correlations between two or more variables. To conclude we are going to compare and then analyze the variables.

Research Type

Based on this research paper's goals and purpose, the approach is from specific to broader and hence is an inductive approach.

Research Strategy

The plan and strategy of this paper is a descriptive research design where we will be solely interested in describing the situation in this research study. It is more of a theory-based research design where we have gathered, analyzed and presented the collected data. The depth of this descriptive research will help us give more insights.

Objectives

1. To identify the functions of the digital rupee.
2. To study the awareness of the digital rupee among the general public.

Sampling Strategy and Data Collection Method

The data collected for this study is through a convenience sampling method; a questionnaire. This questionnaire was circulated to 200 people who responded to it. The data was also collected using survey methods such as online questionnaires and group discussions.

Data Analysis methods

The statistical tools used for the analysis of the collected data were:

- Chi-square test using SPSS
- One Way ANOVA using SPSS

Hypothesis Testing

Objective (i): To identify the functions of the digital rupee

Table showing the relationship between gender and function of e-rupee

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.851	1	17.851	4.829	.029
Within Groups	731.904	198	3.696		

Source: Primary data collected from a structured questionnaire

H₀: there is no association between the gender and non-traceability function of e-rupee.

H₁: there is an association between the gender and non-traceability function of e-rupee.

Since the P value is .029 which is lesser than .050, it is a piece of mere evidence to reject the null hypothesis. So it is inferred that there is an association between the gender and non-traceability function of e-rupee.

The reason could be that every gender would have their level of expectations about their privacy and security issues. As the male respondents were large in this survey, it can be associated that this function of non-traceability would be a good quality they are looking for in an e-rupee. Meanwhile, as there was just a small variation in the female respondents, it can be inferred that they too expect a quality function of non-traceability with this e-rupee.

Objective (ii): To study the awareness of the digital rupee among the general public

Table showing the relationship between monthly income and awareness of the digital rupee

	Value	Df	Asymp. Sig. (2 sided)
Pearson Chi-square	49.862 ^a	32	.023
Likelihood Ratio	52.326	32	.013
Linear-by-Linear Association	1.867	1	.172
N of Valid Cases	200		

Source: Primary data collected through a structured questionnaire

H₀: there is no association between the monthly income and the awareness of the digital rupee among the general public.

H₁: there is an association between the monthly income and the awareness of the digital rupee among the general public.

Since the P value is .023 which is lesser than .050, it is mere evidence to reject the null hypothesis. So it is inferred that there is an association between the monthly income and the awareness of the digital rupee among the general public.

The positive association of monthly income with the level of awareness about the digital rupee could be because people with a good level of education who are paid well would show e-rupee awareness compared to those who lack education and have a lesser income.

Research Results and Findings

The objectives of this study mainly focused on identifying the functions of the digital rupee and gauging its level of awareness among the general public.

Some of the findings from the demographic variables are-

- On analyzing the gender, males turned out to be more active in participating and responding to the questionnaire compared to females.
- When analyzing the age groups, the younger adult generation showed keen interest in responding to the survey.
- On further analyzing the educational status of the respondents, a good majority of them have completed their graduation and post-graduation which signifies that literacy plays an important role in responding to surveys and giving feedback.
- On comparing the occupations of these respondents, the private sector employees were large in number and these working professionals coped up with the latest information around them.
- Finally, on analyzing the monthly income of the respondents, it can be seen that smaller income groups are involved more in more frequent transactions.

Some of the primary data findings are-

- As occupation has a relationship with the educational status of the respondents, it was inferred that the occupation of these respondents had a significant impact on the function of the e-rupee. A higher level of security with the use of blockchain technology was associated with the safety and legalized qualities for the respondents.
- The respondents showed a high level of awareness regarding the UPI and that they are aware of its usage. This shows that they are keen on understanding and adapting to these digital payment systems and their working. Hence, we can infer that they would show a similar interest in understanding of digital rupee.
- The ability to handle the e-rupee was seen to have a significant relationship with the gender and educational level of the respondents. Every gender has its capability to handle things, similarly qualification of respondents also determines their ability to handle the e-rupee.

Some findings from the semi-structured interview- The data was gathered from various officials having expertise in this area of e-rupee management. The respondents also felt that the digital rupee would stabilize the Indian economy and benefit the overall economy. Some inputs given by these experts were-

- The QR code would be dynamic in nature
- No trace of transactions shown to intermediaries
- Pilot study conducted by RBI was to seek feedback of usage
- Higher security in reality and ease down perceived risk for the users

Discussion and Analysis of Findings

The study aimed to identify the functions of the digital rupee and assess its level of awareness among the general public, revealing several significant demographic and primary data insights. Firstly, gender analysis indicated that males were more active in participating and responding to the questionnaire compared to females.

The primary data findings further elaborated on the relationship between occupation and educational status, indicating that respondents' occupations significantly impacted their perception of the digital rupee's functionality. A higher level of security associated with blockchain technology was linked to the perceived safety and legitimacy of the digital rupee among the respondents. High awareness levels regarding UPI usage indicated a general familiarity with digital payment systems, suggesting that respondents would similarly be interested in understanding the digital rupee. Additionally, the ability to handle the digital rupee showed a significant relationship with gender and educational level, underscoring that both factors influence respondents' capabilities in managing digital currencies.

Insights from semi-structured interviews with experts in e-rupee management added depth to the analysis. The experts suggested that the digital rupee could stabilize and benefit the Indian economy. Key points included the dynamic nature of QR codes, the absence of transaction traces for intermediaries, the RBI's pilot study aimed at gathering user feedback and higher security measures to reduce perceived risks. These expert opinions align with the primary data findings, reinforcing the potential of the digital rupee to enhance economic stability and user confidence through robust security features and user-friendly technology.

Finally, this study has highlighted a promising future for the digital rupee, driven by high public awareness, educational influence and expert endorsement of its secure and efficient functionalities. The findings above suggest that with appropriate educational initiatives and

security measures, the digital rupee can gain widespread acceptance and usage, contributing positively to the Indian economy. The active interest shown by younger adults and private sector employees indicates a readiness to adopt new financial technologies, provided they are secure and easy to use. Overall, the digital rupee has the potential to revolutionize the financial landscape, offering a safe and efficient alternative to traditional currency.

Recommendations

The recommendations for future researchers are-

- This study was limited to the geographical limits of Bengaluru City, it is further suggested to carry out this study in various other Metropolitan areas with greater depths to provide a better perspective.
- RBI will have to work towards creating more functional awareness regarding the digital rupee to the general public.
- Further study in this area is highly recommended to help improve various aspects, particularly the technological aspects.
- User friendliness is one of the keys to success in the digital world, the design of e-rupee should be compatible with the Indian Monetary System.
- It is also recommended that RBI will have to define the digital rupee under the definition of the term 'banknote'.

Conclusion

On a general level, the Indian perspective towards digitalization is positive. This gives a hint that the country can bring in innovations as the country is optimistic about this digital era. Initially, when UPI came into existence, people were a little skeptical about adapting to it, but now nearly 7 years after its launch, the public cannot think of not using it. UPI payments have become a routine in everyone's life right now. At the very beginning, the public was worried about using it and did not know if it was safe, but with the progress of time when they saw the whole country slowly adopt it, they experimented with it too. The UPI hit on a widespread basis because of the pandemic but with it, this concept was innovative, inclusive and had an individualistic approach. Security was one of the strong pillars of UPI too along with reliable data protection.

Digital Rupee in the economy can make its presence parallel with physical currency's existence. In a country like India, hard cash still dominates the market making it competitive for digital rupee to come into existence. However, there is a positive sign of digital rupee to

be introduced in the market as an alternative to cash. This study has worked upon accumulating various proven interpretations based on the objectives set as a base to carry forward this research. As a nation, with the introduction of the digital rupee, the currency system would be strengthened. The quality of the digital rupee was also a basis for the general public to match the functions it would associate with. The expected functionality of the digital rupee is predicted to fulfill the needs of the public for carrying out transactions. When it comes to awareness the concerned authorities need to take small steps to create awareness among the public to enhance the term and make this term more familiarized in the economy. Hence, the concept of the digital rupee has reached a good amount of audience via various channels.

Therefore, to conclude, it can be said that with the introduction of the digital rupee, the national economy would benefit as the costs for a country would reduce and eventually result in strengthening the Indian Monetary System. The challenges associated with digital platforms will also be mitigated with the support of higher-edged blockchain technology. Awareness of the digital rupee should be spread wide across the country. Though the digital rupee cannot eradicate the uses of physical cash, it can seem to exist in the parallel economy reducing the burden of hard cash on the public as well as the RBI.

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