

Impact of Digital Currencies on the Indian Economy: A Case Study of the E-RUPI

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Abstract:

The growing presence and importance of digital currencies and their economic implications has become a hot topic of global debate. This research explores the potential impact of digital currencies on the Indian economy. It focuses on the recently launched Central Bank Digital Currency (CBDC), the e-RUPI, as a case study. In summary, the e-RUPI is remarkably similar to a prepaid voucher that can be redeemed without the use of internet, cards, or any other banking services. Employing an examination of current literature, assessments of policies, and observations of consumer behaviour, this study aims to explore the potential advantages and challenges associated with the integration of e-RUPI into the Indian financial system.

The findings aim to provide an insightful perspective on the e-RUPI's contribution to India's economic growth and transformation, whether positive – promoting financial inclusion and decreasing financial crime like money laundering or corruption – or negative – need for technological advancements and cybersecurity risks. The paper concludes by outlining policy recommendations for leveraging the e-RUPI's potential while mitigating associated risks, ultimately paving the way for a robust and inclusive digital economy in India.

Keywords: Digital Currencies, E-RUPI, CBDC, Prepaid Voucher

Research Objectives:

1. To evaluate the usage of digital currency in Mumbai
2. To study and analyse perception of people about E-Rupi in Mumbai
3. To study and analyse the impact of E-Rupi on financial ease and accessibility in Mumbai
4. To forge insights into the future prospects of E-Rupi in Mumbai

Thesis statement: The e-RUPI's pilot phase serves as a crucial testing ground for the future of CBDCs in developing economies, providing valuable insights and lessons for other nations considering similar initiatives.

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Introduction:

History of money:

The world is constantly changing. At the very beginning, there was no money. The very first form of trade

was discovered around 6000 BC – barter system, which the exchange of one commodity for another, without value equivalence. Soon after, metal items came to be very valued commodities, since back then, the knowledge of melting, acquiring it, and using it was not general knowledge. Much later, a money system was established, and after a great deal of transformation, it is still in use. The use of paper notes, coins and cheques is still prevalent all over the world.

Money was not invented by a stroke of genius, but stemmed from a need, and its evolution reflects, at each time, the willingness of man to harmonize its monetary instrument to the reality of its economy. Long gone is the revolution of using paper money. Since then, the world has adopted banknotes and moved into digital forms of payment, including virtual currencies.

Definition of digital currencies:

Imagine you have a physical, solid piggy bank where you keep your money safe. Now, think about having that piggy bank but it is located on your computer or phone instead of your shelf. That is kind of what digital currencies are like. Also commonly known as cryptocurrencies, digital currency is a type of currency that can only be obtained digitally or electronically. There are various different terms for it, including cybercash, digital money, electronic money, and electronic currency. Imagine digital currencies as special coins or tokens that only exist inside computers and phones. They function similarly to the money we use to make purchases, but they are virtual rather than having a tangible form like paper money or metal coins.

History of electronic currencies in the world:

David Chaum was an American cryptographer, who, in 1983, published a paper titled "Blind Signatures for Untraceable Payments." He formulated an anonymous cryptographic electronic money system, known as eCash. The concept was developed by him in the company that he created, named DigiCash. However, it went bankrupt in 1998, despite flourishing electronic commerce, but with credit cards as the "currency of choice".

Imagine a world where money isn't just paper or metal coins but exists purely in digital form. Bitcoin, created in 2008 by Satoshi Nakamoto, revolutionized the world of money by introducing a decentralized digital money system based on blockchain technology. This led to safer and transparent peer-to-peer transactions without intermediaries like banks. Altcoins, like Ethereum, emerged with their own goals and characteristics. Ethereum, introduced in 2015 by Vitalik Buterin, revolutionized the cryptocurrency landscape with its smart contract functionality, allowing developers to build decentralized applications on its blockchain.

Digital currencies, such as Ecash and Bitcoin, have been around since the 1970s and 1980s. However, due to technological and legal challenges, early payment systems relied on cryptography for security and anonymity. Bitcoin, invented in 2009, popularized the idea of a decentralized digital currency running on a peer-to-peer network without middlemen. The underlying technology, blockchain, changed transaction recording and verification. Other cryptocurrencies like Ethereum, Ripple, and Litecoin have evolved with distinct characteristics. Digital asset exchanges have emerged as a result of cryptocurrencies. The last decade has seen a significant increase in the acceptance and awareness of digital currencies, with big businesses and financial institutions evaluating blockchain technology for asset tokenization, supply chain management, and international payments. However, governments and regulatory agencies have struggled to address the regulatory issues raised by virtual currencies, leading to a global patchwork of laws and

rules. Additionally, the emergence of central bank digital currencies (CBDCs) suggest a possible move toward the digitization of conventional forms of money.

Their growing appeal is fuelled by features like cross-border payments that are quicker, safer, and less expensive. Remarkably, a number of nations – China foremost among them – have already introduced virtual currencies backed by their central banks. A digital dollar is also being considered by the US, as it realizes it must stay up with this revolutionary development that is rapidly gaining traction. The increasing utilisation of digital currencies has the potential to alter global agreements and undermine the dominance of conventional fiat currencies.

Introduction to e-RUPI:

The Digital Rupee (₹) or eINR or E-Rupee is a tokenised digital version of the Indian Rupee, issued by the Reserve Bank of India (RBI) as a central bank digital currency (CBDC). e-RUPI, the digital payment solution, was proposed in January 2017 and launched by the Hon'ble Prime Minister of India, Shri Narendra Modi on December 01, 2022, in collaboration with the National Payments Corporation of India (NPCI), the Department of Financial Services, Ministry of Health and Family Welfare, National Health Authority, and other partner banks. It is an innovative initiative where the user can redeem a sum of money without the help of online payment applications, internet banking services or the use of a card. It serves as a cashless and contactless instrument designed specifically for COVID-19 vaccination payments. The Digital Rupee uses blockchain distributed-ledger technology. Reliance Retail in partnership with Innoviti Technologies, ICICI Bank and Kotak Mahindra Bank became the first big, organised retail chain in India to accept ₹. CCAvenue became the first payment gateway to process ₹ for online retail transactions. A cooperation between Indraprastha Gas and IndusInd Bank was launched, with the aim of enabling the usage of digital rupee at specific gas stations within the National Capital Region (NCR) area.

Challenges of implementing e-RUPI:

A number of obstacles must be overcome before e-RUPI transactions can be implemented throughout India. These include the administrative system's complexity, inadequacies in particular districts' computerized infrastructure, and incompatibilities with current payment systems. These difficulties may prevent e-RUPI from being widely used since it will need large investments in interoperability and infrastructure renovation.

Because e-RUPI transactions entail the sharing of highly confidential private and financial data, which raises questions about data safety and assurance, the administrative framework is also susceptible to cybersecurity threats. Furthermore, there may be a lack of awareness and comprehension of e-RUPI and its advantages among many customers, especially in semi-urban and rural areas, which could result in reduced rates of adoption and a reluctance to use sophisticated payment systems.

For e-RUPI exchanges to be widely used and accepted, it is essential to provide clients with a sense of security, comfort, and trust. Enhancing accessibility and convenience also requires availability and interoperability among e-RUPI and other payment methods. Financial restriction and the technology divide may be made more complicated by socioeconomic inequities and gaps in computerized education, which could limit the accessibility of e-RUPI among underprivileged communities.

Last but not least, strong verification features and extortion detection mechanisms are required because e-RUPI exchanges may be subject to extortion and misuse. The development of effective policies and agreements that support the safe, extensive, and economical use of e-RUPI as a revolutionary system for

payment in India will need a coordinated effort by legislators, partners in the industry, and the general public.

Opportunities for e-RUPI:

The Central Bank of India (RBI) launched a trial for a digital currency, the e-Rupee, in December 2022. The initiative's goal was to build a digital version of paper cash that is identical to real currency while also ensuring a smooth transition to digital currency. The RBI issues CBDCs to intermediate banks, who then issue digital wallets to end users. Transactions will be carried out in the same way as with physical currency, with the e-Rupee converted into deposits rather than earning interest.

RBI's E-Rupee Features:

- Offline functionality for CBDC usage in low/no network conditions.
- Programmability for limiting government benefits/grants usage at identified merchants.
- Interoperability for seamless operation of new and legacy payment systems.
- Anonymity for individual's privacy rights.

The RBI's plan to implement a digital twin complements physical currency with advanced technology offers a fast, efficient, and seamless experience.

Different types of digital currencies:

Cryptocurrencies are decentralized digital currencies that use cryptography for security, such as Bitcoin, Ethereum, Ripple, and Litecoin. Tether, USD Coin, and Binance USD are examples of stablecoins, which have a constant value pegged to a reserve of assets. Central Bank Digital Currencies (CBDCs) are digital fiat currencies produced and managed by a country's central bank, such as the Chinese yuan and the Federal Reserve's proposed digital dollar. Tokens represent assets or utilities on their own blockchain, whereas Digital Currencies with Intrinsic Utility offer extra features beyond exchange. Virtual currencies are uncontrolled digital currency utilized by specialized online groups.

Review of Literature:

Kaushal Kumar Jha (2023) provides an outline of India's Digital Rupee. He learns and reports that, as a result of numerous initiatives and technological breakthroughs, digital payment systems have grown significantly in India in recent years. As a result, digital payment systems have grown significantly, revolutionizing the way monetary transactions are carried out and advancing the nation's economy toward greater inclusivity, transparency, and efficiency. Digital payment systems are anticipated to develop further as India embraces the digital revolution, promoting financial empowerment and economic progress for all. Md. Asraful Haque and Mohd Shoaib (2023) examine the difficulties and prospects associated with e₹ while elucidating on its working mechanism. They provide answers to queries and uncertainties about the e₹. How does it operate? What distinguishes it from virtual currencies, like cryptocurrencies? What are the main obstacles and opportunities in India for it?

Deepika Dhamija, Ankit Dhamija, Ravi Ranjan, Shiv Swaroop Jha and Renu (2022) report that demonetization has resulted in an increase in digital payments for the banking industry. Different digital payment networks, such as the Indian government's e-Rupi and the UPI offered by private enterprises, have been introduced by both public and corporate bodies. This study examines e-Rupi's features and

evaluates it against other online payment systems, paying particular attention to its voucher-based system for social services and health benefits.

Peterson K Ozili (2022) studies the advantages and problems associated with the digital Rupee. The study found that people in India who were interested in gaining knowledge on the topic of “cryptocurrency” were also interested learning about “central bank digital currency.” The study also demonstrated the potential advantages of introducing CBDC, which include a decrease in the need for cash, an increase in seigniorage as a result of lower transaction costs, and a decrease in settlement risk.

Rashmi Dabbeeru, D. N. Rao, Seema Bushra and Kriti Gulati (2022) carried out an exploratory study with the aim of analyzing the benefits, potential hazards, and difficulties associated with the introduction of digital currency in India. The paper also skims the surface of the development and expansion, legal issues, and international market dynamics of digital currencies.

Asik Rahaman Jamader (2022) conducted research where the focus of his investigation was to see if demographic analysis impact digital payment adoption intentions in India, as well as to determine one of most essential characteristics towards forecasting customers' adoption intentions or if the trade can sometimes be split among specific consumer categories. The statistical test revealed a significant degree of diversity predicted for technology acceptance, while clustering analysis proves three separate types of customers, each with their own set of requirements.

Jonika Lamba and Dr. Esha Jain (2021) share their learnings about e-RUPI. In light of the COVID-19 pandemic, this study reviewed multiple literatures and attempted to address the benefits and drawbacks of this newly popular prepaid voucher. The beneficiaries of the Modi government's e-RUPI program are expected to reap direct benefits, suggesting that the effort will prove beneficial for the government. It will be dependable and safe for businesses as well as clients. However, it does face hazards associated with ICT, including cyberfraud, hacking, inefficiency, and people's attitude about the implementation of this new resolution.

Tobias Adrian and Tommaso Mancini-Griffoli (2021) provide a conceptual framework to compare and contrast traditional forms of money with their new digital equivalents. They suggest that digital money, issued by private firms and central banks, is transforming payment systems worldwide. While less stable as a store of value, digital money offers advantages as a payment method. They review the benefits and risks that would emerge.

David Chaum (1983) Digital signatures that involve blinding the message before signing them are known as blind signatures. “A blind signature is such a digital signature wherein the message is blinded before it is signed.” As so, the substance of the message will remain unknown to the signer. Only after it is signed, will the message become visible again. It can currently be publicly verified against the original message and is comparable to a standard digital signature.

Methodology:

- **Sources of data:** The researchers used primary and secondary data for the objective of the study. The questionnaire method was used to acquire primary data. Through a variety of official publications, websites, news portals, and journals, secondary data was gathered.
- **Structure of Research:** Data from the respondents was gathered through descriptive research.
- **Method of Sampling:** This study was carried out using the Random Sampling Technique.
- **Sample Size:** A total of 96 respondents from the Mumbai area completed the questionnaire used to analyse the data.

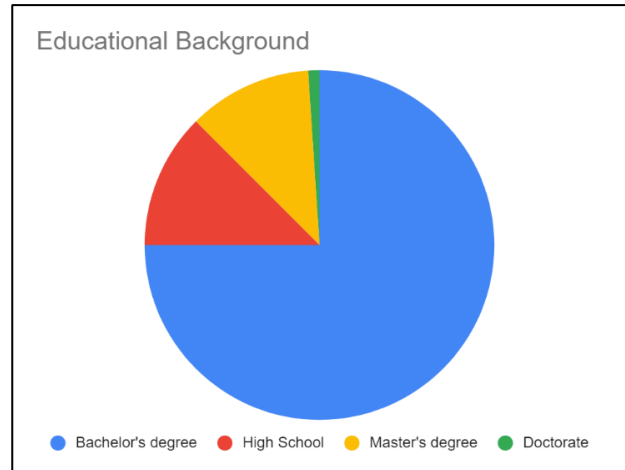
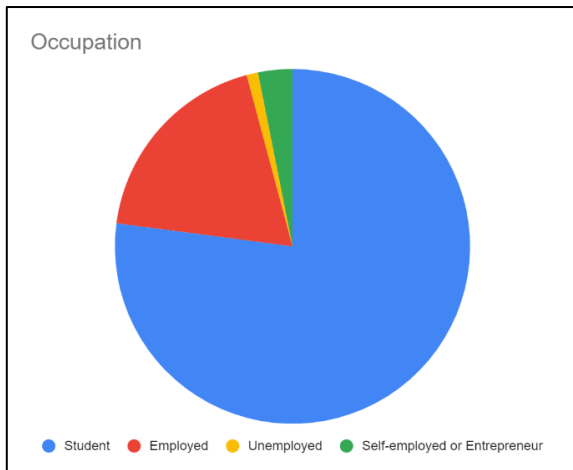
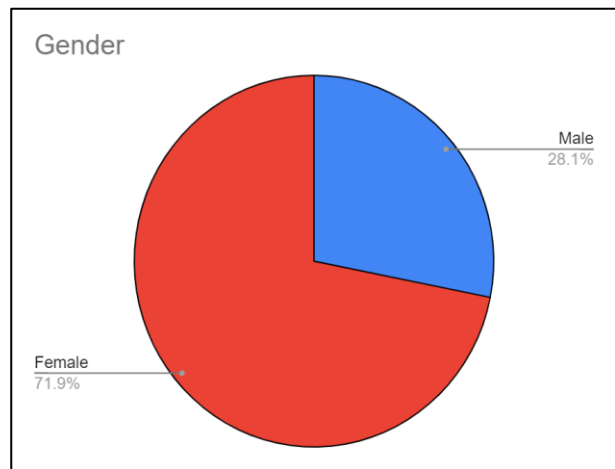
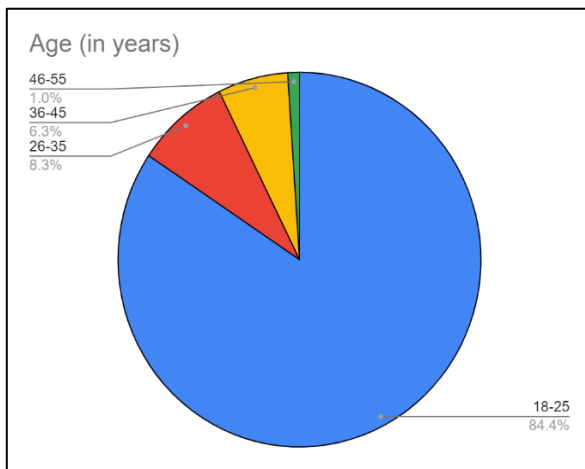
- **The tools for statistical analysis:** Mean, Average, and Graphs such as Bar and Pie Charts.

Results:

Questionnaire:

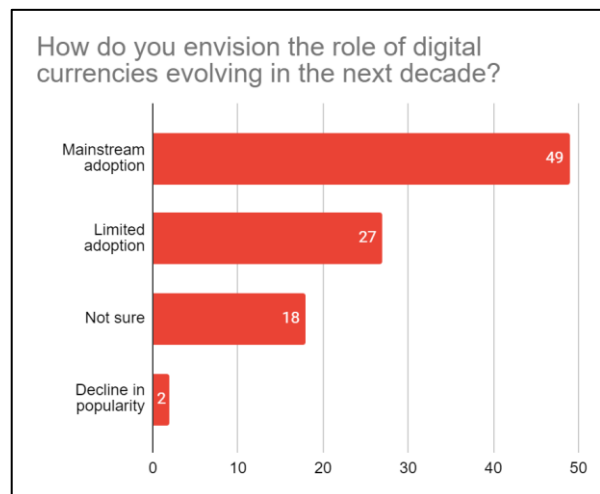
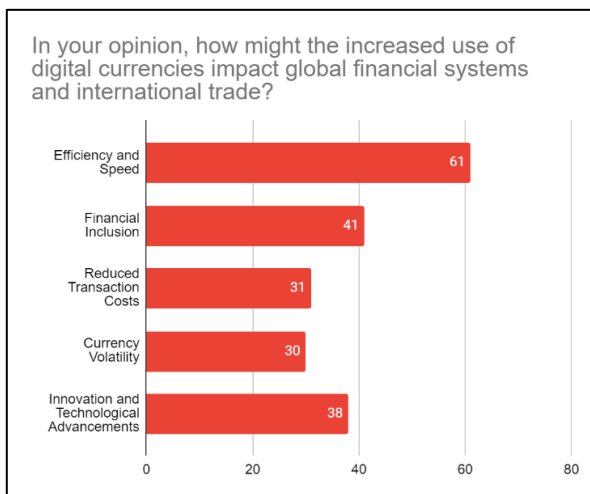
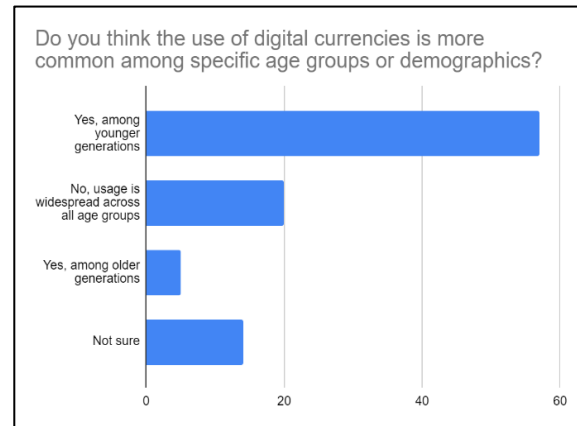
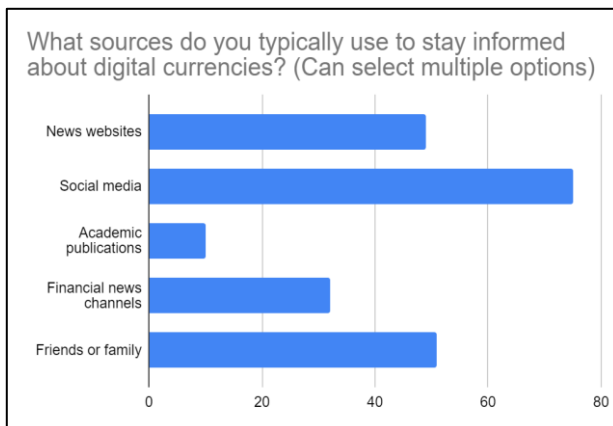
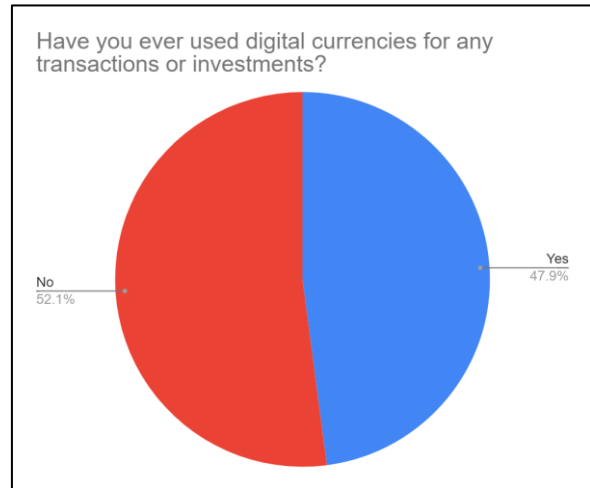
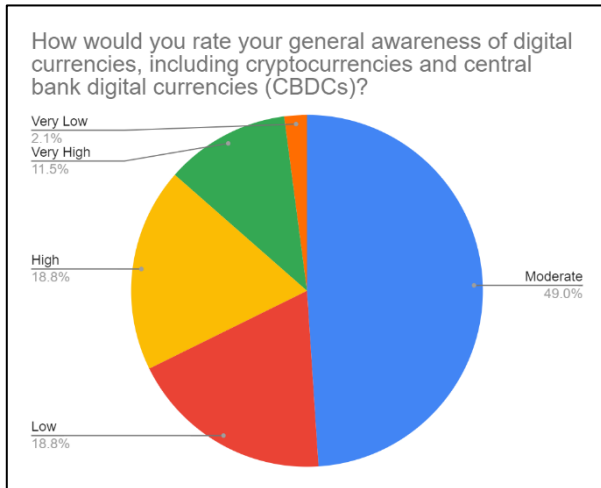
Section 1: The growing presence and importance of digital currencies and their economic implications has become a topic of global debate. This questionnaire is designed to collect information about people's perception on the impact of the same on the Indian economy, specifically based in the city of Mumbai.

(Demographics)



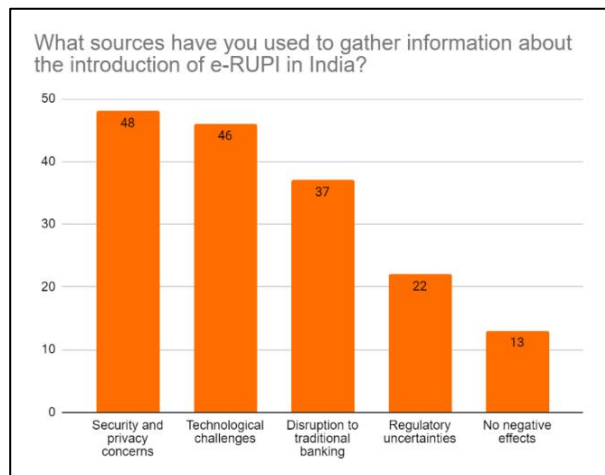
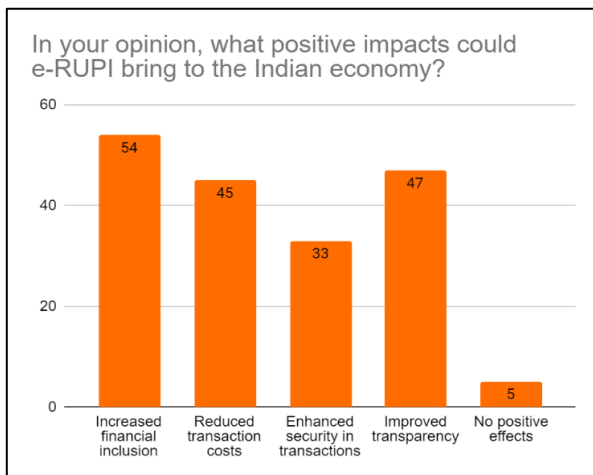
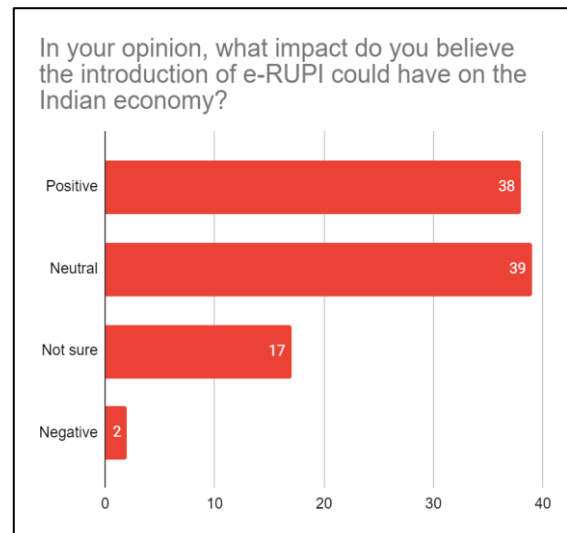
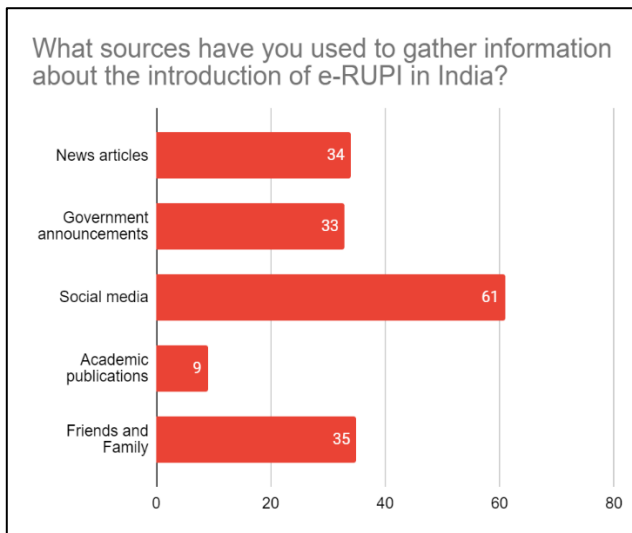
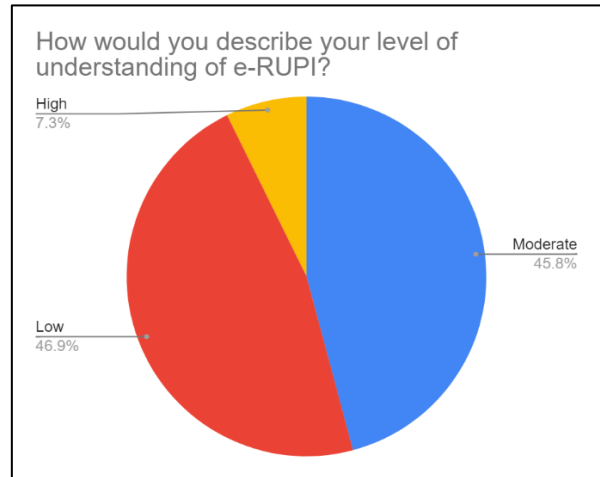
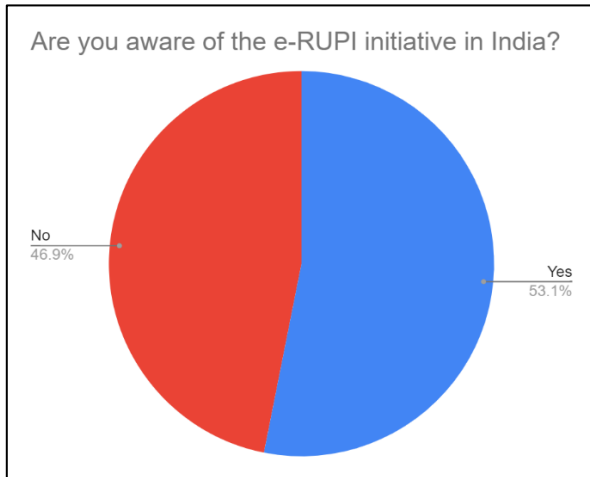
Section 2: Awareness and Usage of Digital Currencies

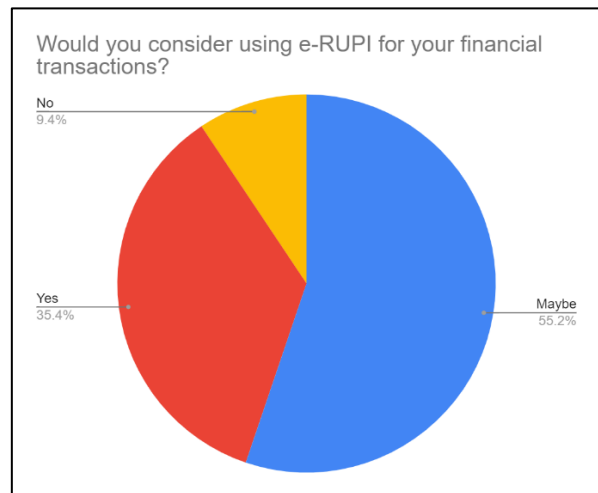
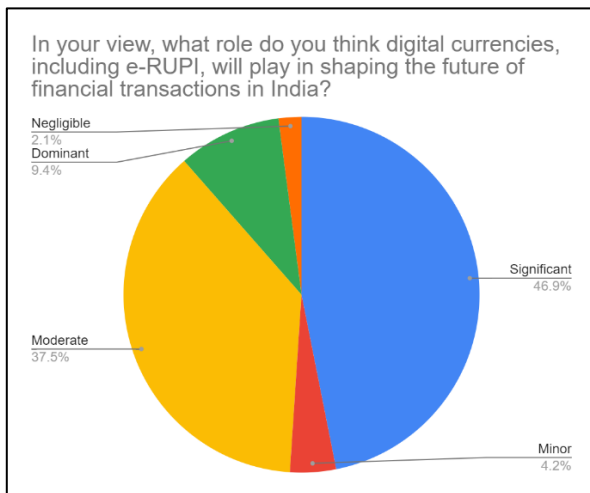
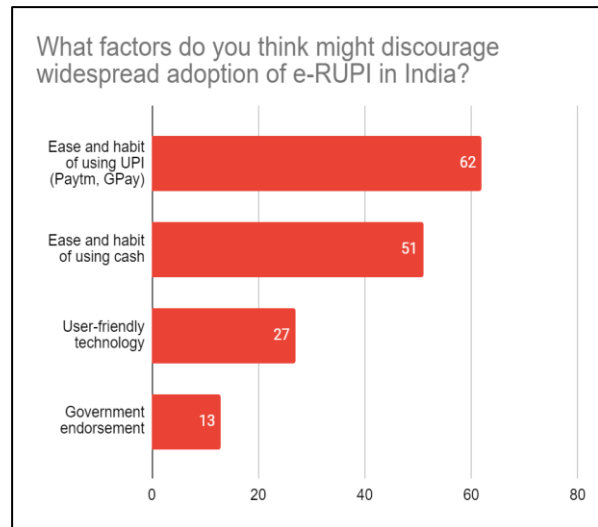
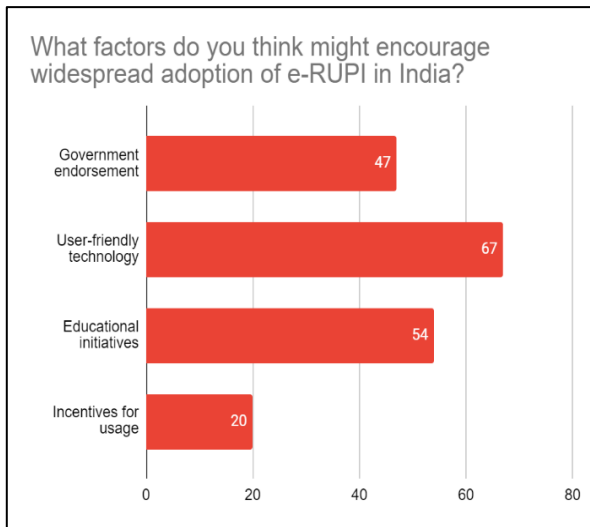
A digital currency is a payment method that exists only in electronic form. It is not physically tangible; examples include Bitcoin, Ethereum, Ripple, Litecoin, etc.



Section 3: Introduction of e-RUPI in India

e-RUPI is a wholly cashless and no-contact electronic payment instrument that will be delivered to beneficiaries' mobile devices (even mobile devices that are non-android or iOS) as either a QR code or an SMS-based e-voucher.





Conclusion:

Research Findings on E-Rupi

- Widespread lack of public awareness about E-Rupi.
- Despite government efforts, general inclination for other payment options.
- Urgent need for increased public education and awareness campaigns.
- Government officials and legislators should prioritize awareness efforts and educational initiatives.
- Actions needed to advance financial inclusion and utilize digital payment systems for economic growth and social progress.

E-Rupi Strategy

- Collaboration with private sector for enhanced awareness campaigns.
- Incentivization of E-Rupi usage to shift public preference.
- Regular updates and improvements to meet evolving user needs.
- Partnerships with financial institutions for promoting benefits.
- Monitoring and evaluation for policy making and system enhancement.

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