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RESEARCH ARTICLE

"DIGITAL ARTHA AND UPI: A PARADIGM SHIFT IN INDIA'S PAYMENT INFRASTRUCTURE"

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Abstract

Digital transformation has emerged as a transformative force in India's financial sector,driving a shift from traditional paper-based transactions to technology driven, virtual payment systems. The COVID 19 pandem ic accelerated this change, as consumers increasingly preferred contactl ess and paperless payments for safety and convenience, leading to widespread adoption of digital financial platforms across the country. Digital payments involve transactions conducted through electronic or online channels, allowing both payers and payees to transfer money seamlessly, either online or at physical points of sale. Compared to cash transactions, digital payments are faster, more secure, cost-efficient, transparent, and reduce risks associated with theft and fraud.Among these innovations, the Unified Payments Interface (UPI) stands out as a major development in India's financial ecosystem. UPI enables instant, real-time fund transfers between bank accounts via mobile applications, offering seamless and accessible payments. Alongside UPI, India's digital payment ecosystem includes banking cards, mobile wallets, internet and mobile banking services such as NEFT, RTGS, and IMPS, USSD-based payments, Aadhaar Enabled Payment Systems (AEPS), POS and contactless payments, FASTag, and other electronic modes.U PI also represents a bridge between modern financial technology and Indian Knowledge Systems (IKS). Historically, IKS encompassed barter systems, local trade, and community-based financial practices, where transactions relied on trust, social relationships, and immediate reciprocity.

UPI, with its real-time, secure, and traceable transactions, provides a digital counterpart to these traditional practices, enabling local communities, small vendors, and artisans to participate in formal financial systems while maintaining the ethos of trust, accountability, and social cohesion inherent in IKS. Features such as UPI Lite X for offline payments, multilingual support, and low-value transaction options make digital finance accessible to rural and semi-urban populations, preserving traditional socio-economic interactions while promoting financial inclusion, transparency, and economic formalization.This study examines the impact of digital transformation on India's

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financial sector, emphasizing UPI as a key driver of paperless transactions and as a modern tool that complements IKS. It analyses changes in consumer payment behaviour, particularly post-pandemic, and highlights UPI's growth, usage, and significance compared to other digital payment modes. The study also underscores the role of UPI in enabling inclusive financial access, reducing dependency on cash, enhancing transparency, and integrating traditional economic behaviours into a digitally empowered economy.

Introduction:-

Background

In April 2009, the National Payments Corporation of India (NPCI) was established to integrate and standardize all retail payment mechanisms in India. At that time, the Reserve Bank of India (RBI) reported an average of just six non-cash transactions per capita annually, despite over 10 million retailers accepting card payments. Cash transactions contributed significantly to black money and corruption, prompting RBI to release a vision statement in 2012 focused on creating a safe, efficient, accessible, inclusive, and interoperable payment and settlement system, also supporting the Green Initiative to reduce paper use.

The Unified Payments Interface (UPI) was officially launched in 2016 for public use under NPCI guidance, designed to be simple, secure, and interoperable. UPI works on a four-pillar push-pull model, with front-end payment service providers (PSPs) and back-end banks handling settlements. Its success has made it one of India's most significant deep-tech financial innovations. By 2020, India became the world's largest real-time payment market, recording 25.5 billion transactions, surpassing China, South Korea, Thailand, and the United Kingdom.

The government and RBI have continually enhanced UPI features, including increasing transaction limits for IPOs from ₹100,000 to ₹500,000, proposing cardless ATM withdrawals via QR codes, and launching UPI Lite X and VOICESE to facilitate offline and voice-based transactions for feature phone users in multiple regional languages. Globally, countries such as Brazil, Bahrain, Saudi Arabia, Singapore, the United States, and the European Union are exploring UPI-like systems.The evolution of digital money predates UPI, with early concepts such as David Chaum's "Blind Signatures for Untraceable Payments" in 1983 and Digicash in 1989. E-Gold in 1996, PayPal in 1998, and Bitcoin in 2009 further revolutionized online and decentralized currencies. These systems demonstrated the potential of digital cash and blockchain-based currencies, laying the foundation for India's adoption of UPI as a real-time, secure, and widely accessible digital payment infrastructure.

Connection of IKS to Present UPI System:

UPI represents a modern financial innovation that can be linked to IndianKnowledge Systems (IKS) through its ability to integrate traditional, community-based economic practices into a digital framework. Historically, IKS encompassed barter systems, local trade, and communal financial management, where transactions were based on trust, social relationships, and reciprocity. UPI, with its real-time, secure, and traceable transactions, acts as a digital counterpart to these practices, enabling local communities, small vendors, and artisans to participate in formal financial systems while maintaining the ethos of trust and accountability inherent in IKS.Features like UPI Lite X for offline payments, multilingual support, and low-value transactions make it accessible to rural and semi-urban populations who previously relied on informal financial methods. By bridging traditional economic behaviors with digital payment infrastructure, UPI not only promotes financial inclusion, transparency, and economic formalization but also preserves local socio-economic patterns, demonstrating how modern technology can complement and enhance the principles of IKS in India.The Indian banking sector has undergone major structural reforms with the adoption of advanced information and technology, shifting from paper-based to digital transactions. The COVID-19 pandemic further accelerated this transition, with contactless payments preferred over cash due to social distancing. UPI, launched by NPCI, enables instant money transfers via smartphones 24x7, contributing to India's emergence as a global leader in digital payments and supporting a less-cash, digitally empowered economy.

Objective:-

- To examine the role of UPI in enabling seamless interoperability, real-time accessibility, and cost-efficient digital transactions within India s financial ecosystem, while integrating traditional, community-based economic practices.
- To analyze how UPI promotes universal financial inclusion, transparency, accountability, and economic formalization through secure and digitally traceable payment systems, linking modern digital payments with the trust-based and socially governed structures of IndianKnowledge Systems.
- To study the advancement of UPI in terms of enhanced security measures, dynamic authentication, high-value transaction monitoring, and its growing scope of internationalization, ensuring that digital financial systems support both modern requirements and the socio-economic principles embedded in IKS.

Insights

- In January 2026, UPI set a new record with 21.7 billion transactions valued at ₹28.33 lakh crore.
- For the full year 2025, UPI processed 228.3 billion transactions, a 32% increase from 2024.
- India now powers nearly 50% of all real-time global digital payments.
- The "KIRANA EFFECT": Person-to-Merchant (P2M) transactions now dominate,
- The integration of RUPAY credit cards and pre-sanctioned credit lines on UPI is driving higher transaction values, with over 7.4 million users accessing credit via UPI by mid-2025.
- New features like biometric authentication for payments up to ₹5,000 are being rolled out to reduce the friction of entering a PIN.
- UPI Lite X (using NFC) now supports completely offline transactions up to ₹5,000 to aid users in areas with poor connectivity.

SCOPE

The study goes beyond the basic functioning of the Unified Payments Interface (UPI) to examine its wider impact on India's digital payment ecosystem and overall economic structure. It explores UPI's role in promoting a less-cash economy by simplifying banking processes into a single virtual identity and enabling secure, real-time, and mobile-first transactions through the NPCI framework. The research also analyzes how UPI has improved financial accessibility across diverse regions, including remote and rural areas, while reducing reliance on physical currency and enhancing transparency through digitally traceable systems like Direct Benefit Transfers (DBT).The study further considers the expanding applications of digital money in India, including person-to-merchant (P2M) payments, recurring bill payments via platforms such as Bharat Connect, and credit-enabled transactions through RuPay credit cards on UPI. It examines UPI's growing international reach through integration with global payment systems like Singapore's PayNow and the UAE's NEOPAY. Technological advancements such as UPI Lite X for offline payments and UPI 123PAY for feature phone users are included to demonstrate inclusivity across all demographics, from urban users to rural small-scale vendors, reflecting how modern digital payments can complement traditional community-based economic practices aligned with Indian Knowledge Systems.

Literature Review:-

- (Kumar & Menon Suseela, 2020): The study entitled, "Impact of Unified Payment Interface System on Customer Satisfaction and Role of National Payment Corporation of India in Promoting Digital Transactions", analyzed customer perception towards various aspects of UPI and understand the relationship between UPI aspects and customer satisfaction. They attempted to identify the major problems faced by customers regarding UPI service access. They found respondents Dimensions of UPI services and customer satisfaction are closely related Majority of the respondents agree with Lack of e literacy and complexity in operation is the most important problems related with UPI services
- (Baghla, 2018): A study was made to find out the attitude of people towards adoption of digital payments in India and o find out the problems faced by people in making digital transfers. They also attempted to find out the most popular method of digital payments and to have an idea regarding the expected future of digital payments in India. They found that, lack of trust among people in digital payments and Lack of knowledge and awareness among uneducated or less advanced people less reliability due to scams and hacking cases. Loss of internet connection sometimes and delay in cash back processing by E-commerce Companies and e- wallet Companies.
- (Kumar & Menon Suseela, 2020): Studied the impact of UPI on customer satisfaction and highlighted the role of NPCI in promoting digital payments in India. They found that digital literacy, ease of use, and trust significantly influence adoption and satisfaction. Challenges such as security concerns and operational complexity were identified, especially among less tech-savvy users. The study concludes that UPI's growth depends on awareness, infrastructure, and user-friendly services.
- (View of IMPACT OF COVID-19 ON DIGITAL PAYMENTS.Pdf, n.d.): highlights how the pandemic accelerated the adoption of digital payment systems, especially UPI and mobile wallets, due to social distancing and reduced cash use. The study observes a significant increase in transaction volumes and new users, including first-time digital payers. It also notes challenges such as digital literacy gaps, cybersecurity concerns, and infrastructure limitations. Overall, the research concludes that COVID-19 acted as a catalyst for digital financial inclusion and cashless transaction growth in India.
- ("Impact Of The First Wave Of Coronavirus On Upi Payments: A Major Boost To Digitalization," 2021) : The study by Bohra, Agarwal & Prakash (2021) found that the first wave of the COVID-19 pandemic acted as a catalyst for UPI adoption, pushing more users toward digital transactions due to concerns about virus

transmission through cash. It highlights that despite a short-term dip in transaction value during initial lockdowns, UPI usage increased as users preferred contactless payments. The research identifies cost efficiency, speed, mobility, and reduced cash handling as key factors behind UPI's growth. Overall, the paper concludes that COVID-19 significantly boosted digitalization and strengthened UPI's role in India's payment ecosystem.

- (Tyagi et al., 2022): an empirical study on digital payment applications in India, focusing on the adoption and usage patterns of major UPI apps like PhonePe, Google Pay, Amazon Pay, Paytm, and BHIM. Their research, based on a survey in the Pune region, found that UPI adoption is increasing rapidly due to factors such as ease of use, instant transactions, and security features. They also observed that demographic and technological trends are driving a shift from cash to digital payments. The study concludes that UPI is likely to maintain its growth trajectory and play a central role in India's digital transaction ecosystem.
- (Perkebunan & Papua, n.d.): refers to research or reports on the digital transformation and economic activities in the Papua region's plantation (perkebunan) sector. Although there is no specific published PDF under this exact citation, related studies show that digital payment adoption and financial inclusion efforts are being explored in Papua, particularly among MSMEs and market vendors, where digital payments are being introduced to traditional markets to increase cashless transactions. For instance, Bank Indonesia launched QRIS digital payments at a traditional market in West Papua to support micro-enterprises adapting to digital financial systems during and after the pandemic. This reflects how digital payment infrastructure is gradually penetrating rural and plantation-linked economies in Papua, highlighting both adoption potential and the need for increased digital literacy and supportive infrastructure in less developed regions.

Methodology:-

The study adopts a descriptive research design to examine the adoption and usage of the Unified Payments Interface (UPI) and digital payment systems in India.

Primary data were collected using a structured questionnaire designed to capture respondents' awareness, usage patterns, and perceptions of UPI-based digital payments. The questionnaire was distributed through **Google Forms**, and responses were collected using the random sampling method to ensure unbiased participation from UPI users. The online mode of data collection was considered appropriate due to the digital nature of the study and the widespread use of electronic payment platforms.

Secondary data were gathered from various reliable and published sources, including academic journals, research papers, textbooks, RBI and NPCI reports, government publications, newspapers, and authentic websites. These sources provided conceptual understanding and background information on digital transformation, the evolution of digital money, and the UPI ecosystem.

The use of both primary and secondary data helped in gaining a comprehensive understanding of the subject and supported the objectives of the study.

Data Analysis:

In 2026, the methodology for studying UPI and digital money varies across disciplines, reflecting both technological and socio-economic perspectives.In the Arts, the focus is on the socio-economic impact of financial technology on creative industries and rural livelihoods in India. Research emphasizes how the "frictionless" nature of UPI has democratized the creative economy, allowing local artisans and performers to receive instant payments via QR codes without intermediaries. Field-based impact assessments study the shift from cash to digital literacy among traditionally unbanked communities and the role of Direct Benefit Transfer (DBT) in supporting cultural heritage. The Arts stream also emphasizes vernacular outreach, using storytelling and regional-language campaigns to teach digital safety and grievance redressal. Administratively, educational institutions have standardized the use of UPI Lite X for offline transactions in heritage sites and rural workshops, ensuring that digital finance remains deeply rooted in social inclusion and the preservation of India's creative workforce.In Commerce, the approach is grounded in a "FinTech-First" framework, where curriculum and practice focus on real-time settlement systems and the digital formalization of the economy. Commerce education and industrial practice use a data-driven methodology to analyze transaction cycles, studying how the NPCI framework reduces the "cash-to-cash" cycle for small businesses and MSMEs. Students and professionals employ analytical modeling to study the integration of RUPAY credit lines on UPI, evaluating how digital footprints are being used for algorithmic credit scoring in place of traditional collateral. The methodology also emphasizes regulatory compliance and auditing, teaching automated ledger reconciliation and the tax implications of Zero-MDR (Merchant Discount Rate) policies. Administratively, commerce institutions have moved toward embedded finance, using API-based payment gateways for seamless fee management and AI-driven risk assessment for high-value transactions, preparing the next generation of professionals for a fully transparent and hyper-connected global market.In Science, the methodology is centered on

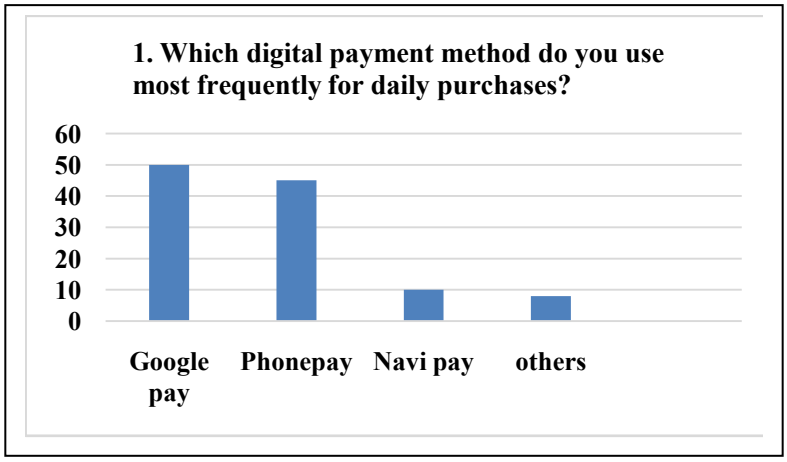
technical architecture, cybersecurity research, and data science. The focus is on cryptographic protocols and API frameworks to ensure transaction integrity, with an emphasis on AI-driven fraud detection that can identify suspicious patterns in milliseconds. Scientifically, the methodology involves stress-testing system scalability to handle over 20 billion monthly transactions and researching NFC (Near-Field Communication) and Bluetooth-based protocols for offline solutions like UPI Lite X. Big data analytics is used to model consumer behavior and optimize network latency. Administratively, science departments are exploring biometric authentication beyond static PINs, testing facial and iris recognition to enhance "risk-based authentication" frameworks, ensuring digital money methodologies prioritize technical security and systemic resilience.

The evolution of money provides the historical context for this analysis. Initially, pre-economic gift economies and barter systems functioned on mutual sharing and communal obligation, without standardized measures of value. Commodity money such as salt, shells, and grain emerged, followed by metallic money, paper currency, and credit-based systems. The mid-20th century introduced plastic and credit money, and the digital revolution brought online banking and the Unified Payments Interface (UPI) in 2016. By 2022–2026, Central Bank Digital Currencies (CBDCs) marked the transition to programmable, borderless, and digitally traceable assets. UPI represents a culmination of this evolution, enabling secure, real-time transactions, promoting financial inclusion, transparency, and economic formalization, while connecting modern digital systems with the socio-economic behaviors and community-based practices historically present in IndianKnowledge Systems.

Interpretation:-

Which digital payment method do you use most frequently for daily purchases?

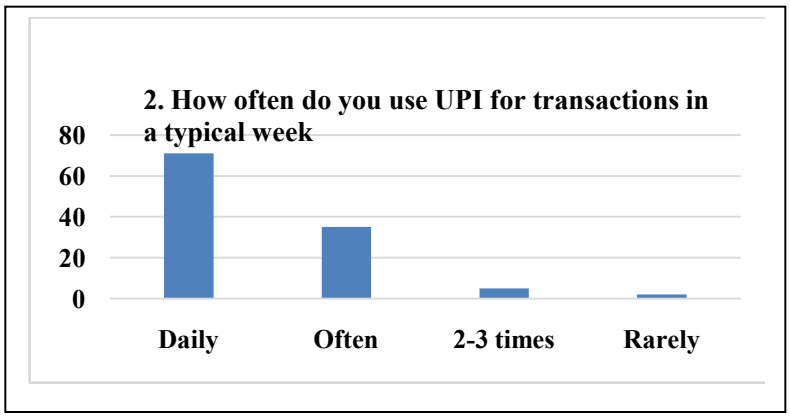
Particulars	Respondents	%
Google pay	50	44%
phonepay	45	39%
Navi pay	10	8%
others	8	7%
Total	**113**	**100%**



Response: Google Pay is the most preferred payment app with 44% of respondents, followed closely by PhonePe at 39%, showing strong user preference for these two platforms.Navi Pay (8%) and other apps (7%) have significantly lower usage, indicating comparatively limited adoption among respondents.

How often do you use UPI fortransactions in a typical week?

Particulars	Respondents	%
Daily	71	62%
Often	35	30%
2-3 times	5	4%

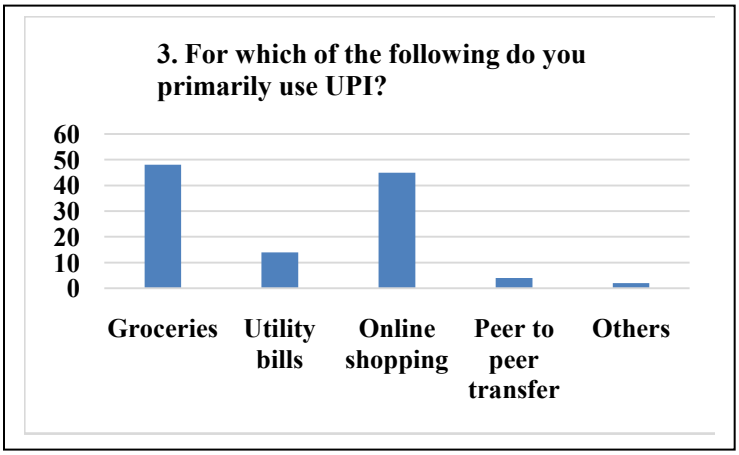


Rarely	2	1%
Total	**113**	**100%**

Response: Daily usage is the highest at 62%, indicating that most respondents use the service on a regular basis, followed by Often at 30%.In contrast, 2–3 times (4%) and Rarely (1%) show minimal usage, reflecting very limited engagement among a small group of respondents.

For which of the following do you primarily use UPI?

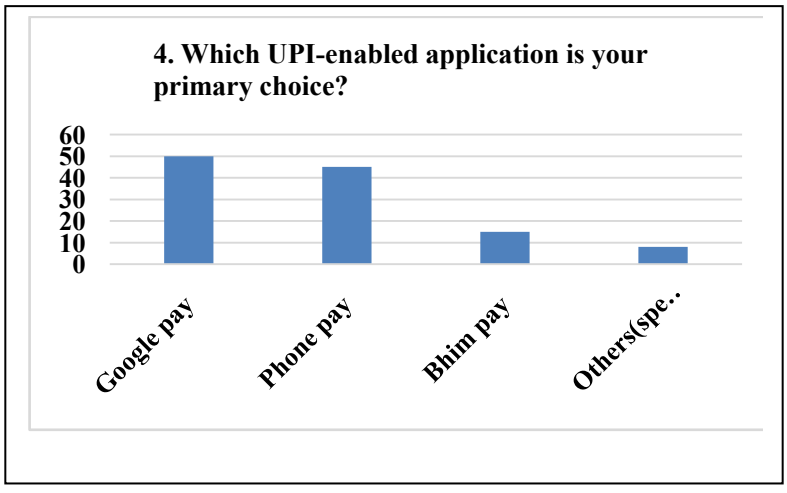
Particulars	Respondents	%
Groceries	48	42%
Utility bills	14	12%
Online shopping	45	39%
Peer to peer transfer	4	3%
Others	2	1%
Total	**113**	**100%**



Response: Groceries account for the highest usage at 42%, closely followed by online shopping at 39%, indicating that most respondents use payments for everyday and digital purchases. Utility bills (12%), peer-to-peer transfers (3%), and other purposes (1%) show comparatively lower usage, making them the least common uses among respondents.

Which UPI-enabled application is your primary choice?

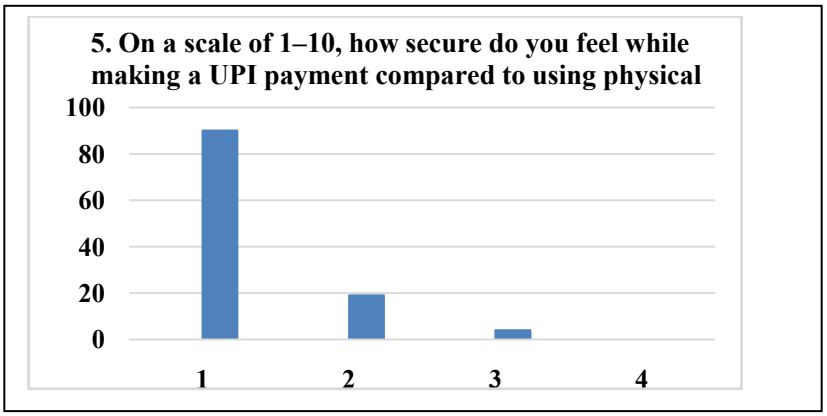
Particulars	Respondents	%
Google pay	50	44%
Phone pay	45	39%
Bhim pay	15	13%
Others(specify)	8	7%
Total	**113**	**100%**



Response: Google Pay ranks highest with 44% of respondents, followed by PhonePe at 39%, showing that these two apps dominate user preference.BHIM Pay (13%) and other apps (7%) have lower adoption, indicating comparatively limited usage among respondents.

On a scale of 1–10, how secure do you feel while making a UPI payment compared to using physical cash?

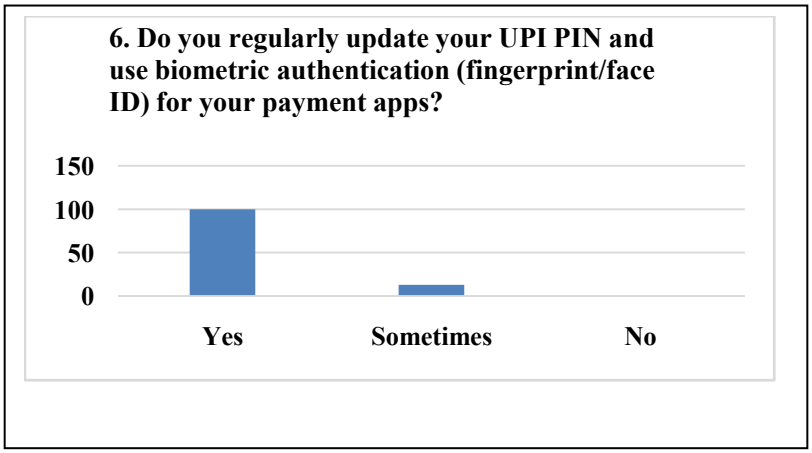
Particulars	Respondents	%
10 to 07	90	79%
06 to 04	19	16%
03 to 01	4	3%
0	0	0%
Total	**113**	**100%**



Response: The majority of respondents fall in the 10 to 07 category (79%), indicating a high level of usage or satisfaction in this range.This is followed by 06 to 04 (16%), while 03 to 01 (3%) shows very low representation and no respondents fall in the 0 category.

Do you regularly update your UPI PIN and use biometric authentication (fingerprint/face ID) for your payment apps?

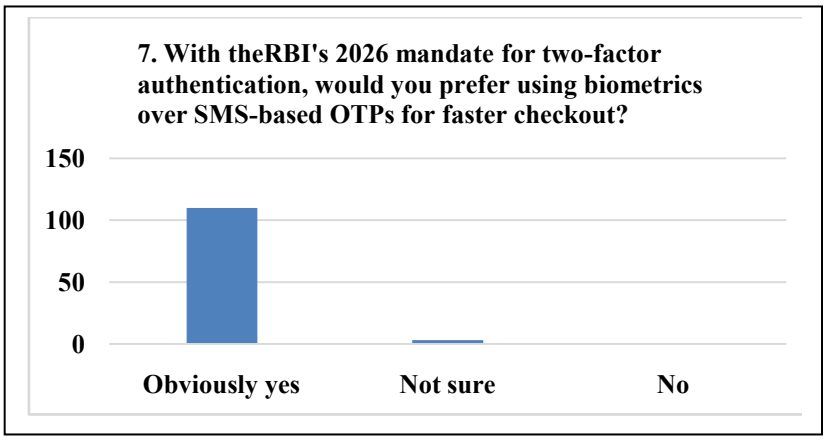
Particulars	Respondents	%
Yes	100	88%
Sometimes	13	11%
No	0	0%
Total	**113**	**100%**



Response:A large majority of respondents (88%) answered Yes, indicating strong acceptance or agreement toward the factor studied.A smaller group (11%) responded Sometimes, while no respondents selected No, showing an overall positive response.

With the RBI's 2026 mandate for two-factor authentication, would you prefer using biometrics over SMS-based OTPs for faster checkout?

Particulars	Respondents	%
Obviously yes	110	97%
Not sure	**3**	3%

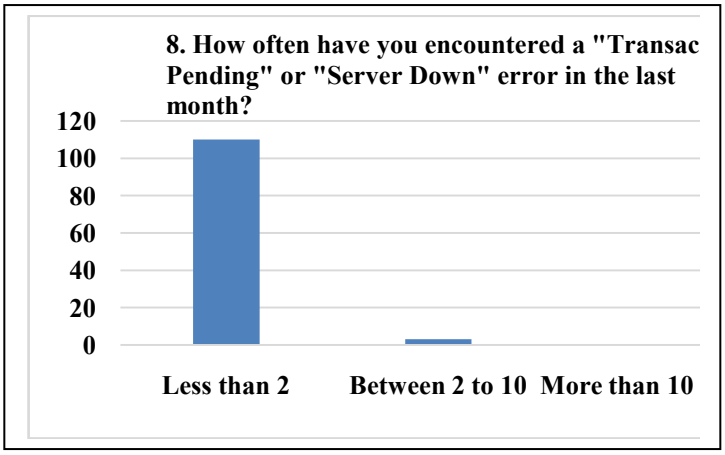


No	**0**	0%
Total	**113**	**100%**

Response: An overwhelming majority of respondents (97%) selected “Obviously yes”, showing very strong and clear agreement.Only 3% were not sure, and no respondents chose No, indicating almost unanimous positive opinion.

How often have you encountered a "Transaction Pending" or "Server Down" error in the last month?

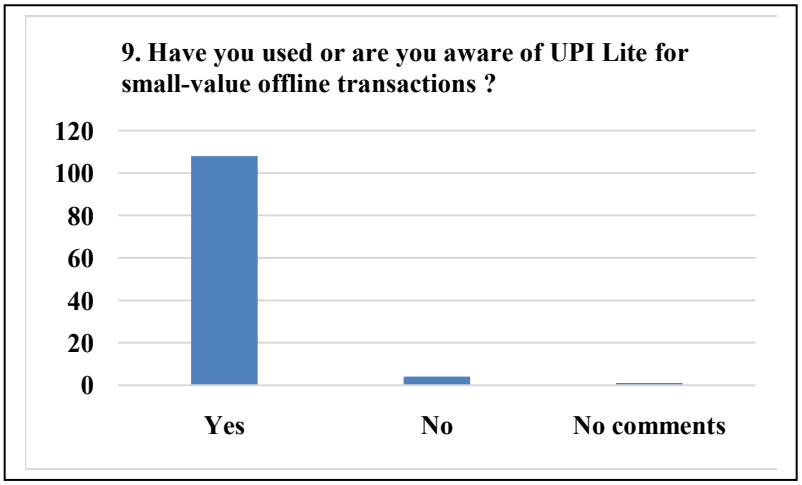
Particulars	Respondents	%
Less than 2	110	97%
Between 2 to 10	3	3%
More than 10 times	0	0%
Total	**113**	**100%**



Response: The vast majority of respondents (97%) fall under less than 2, indicating minimal frequency or occurrence.Only 3% are in the 2 to 10 range, while no respondents reported more than 10 times, showing very low overall intensity.

Have you used or are you aware of UPI Lite for small-value offline transactions?

Particulars	Respondents	%
Yes	108	95%
No	**4**	3%
No comments	**1**	0.80%
Total	**113**	**100%**



Response: Most respondents (95%) answered Yes, indicating a strong positive response toward the given aspect.Only 3% said No, and 0.8% gave no comments, showing minimal disagreement or uncertainty.

Findings

UPI Adoption and Usage

- Google Pay (44%) and PhonePe (39%) are the most widely used UPI applications, highlighting their dominance in the Indian digital payments ecosystem.
- 62% of respondents use UPI daily, indicating that the platform has become an integral part of routine financial transactions.
- Major usage includes groceries (42%) and online shopping (39%), demonstrating UPI's role in both everyday needs and digital commerce. These patterns show how UPI has successfully transitioned traditional community-based exchanges into a formal digital framework.

Financial Inclusion, Trust, and Transparency

- A vast majority of respondents (95–97%) expressed trust in UPI, reflecting high confidence in secure and digitally traceable transactions.
- Minimal operational issues were reported, with 97% of users facing fewer than two problems, indicating system reliability and accountability.
- UPI contributes to economic formalization by digitally recording transactions and reducing dependency on cash, thereby bridging informal community-based financial practices with modern digital systems, aligning with the principles of IndianKnowledge Systems.

Security and Technological Advancement

- Users perceive high levels of security, dynamic authentication, and fraud protection as major strengths of UPI.
- The surge in adoption following the COVID-19 pandemic demonstrates UPI's capacity for high-value transactions and readiness for broader applications, including internationalization.
- While adoption is widespread, minor barriers persist among older users or those with lower digital literacy, highlighting the need for targeted awareness campaigns to ensure inclusive access across all demographic groups.

Conclusion:-

UPI has emerged as a highly effective and widely adopted digital payment system in India, enabling seamless, real-time, and cost-efficient transactions. The high daily usage and preference for apps like Google Pay and PhonePe show that UPI is deeply integrated into everyday financial activities such as groceries and online shopping. Its features ensure interoperability across banks and apps, while secure authentication and minimal operational issues enhance user trust and reliability.

Moreover, UPI not only drives financial inclusion, transparency, and economic formalization**,** but it also aligns with Indian Knowledge Systems (IKS) by integrating traditional financial practices into a modern, traceable, and accessible framework. By bridging local economic behaviors with digital infrastructure, UPI supports **inclusive** growth, preserves community-based economic interactions**,** and demonstrates how modern technology can complement and enhance traditional knowledge systems in India's diverse socio-economic landscape.

References:-

- Baghla, A. (2018). a Study on the Future of Digital Payments in India. International Journal of Research and Analytical Reviews, 5(4), 85–89. http://ijrar.com/
- Impact Of The First Wave Of Coronavirus On Upi Payments: A Major Boost To Digitalization. (2021). In Elementary Education Online (Vol. 20, Issue 4). https://doi.org/10.17051/ilkonline.2021.04.444
- Kumar, I. N. S., & Menon Suseela. (2020). Impact of Unified Payment Interface System on Customer Satisfaction and Role of National Payment Corporation of India in Promoting Digital Transactions. International Journal of Research in Engineering, Science and Management, 3(1), 508–510.
- Perkebunan, K. D., & Papua, P. (n.d.). No View of Impact of the Covid-19 Outbreaks on Digital Payments-A Study in Bengaluru City Title. 3.
- Tyagi, G., Jagadale, H., & Anute, N. (2022). A study on digital payment applications in India. Journal of Management Research and Analysis, 9(3), 150–156.

View of IMPACT OF COVID-19 ON DIGITAL PAYMENTS.pdf. (n.d.).