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UPI and Financial Inclusion in India: An Analytical Study of Digital Payment Transformation

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1. Abstract:-

The rapid development of digital technology has revolutionized the financial ecosystem in India, significantly impacting financial inclusion across various socio-economic sectors. The Unified Payments Interface (UPI), launched by the National Payments Corporation of India (NPCI) in 2016, has revolutionized the country's digital payments sector and has emerged as a cornerstone of India's financial inclusion strategy. This research paper titled "UPI and Financial Inclusion in India: An Analytical Study of Digital Payment Transformation" examines how digital payment systems such as Unified Payments Interface (UPI), mobile banking, internet banking and digital wallets have contributed to expanding financial access. This research paper analyses the impact of UPI on financial inclusion using secondary data, which is sourced from the Reserve Bank of India (RBI), NPCI and government publications. The study examines how UPI has increased accessibility, transparency and participation in the formal financial system across various socio-economic groups. Despite its success, challenges such as digital illiteracy, cybersecurity risks and infrastructure limitations persist, especially in remote areas. The study emphasizes that to sustain the momentum of digital inclusion, India must strengthen awareness programs, ensure strong data security and expand digital infrastructure. The paper concludes that UPI is not just a payment mechanism but a transformative tool driving inclusive and equitable economic growth. It represents a major step towards creating a financially empowered, digitally connected India. The analytical insights of this study demonstrate that digital payment systems are not just tools of convenience but strategic tools driving inclusive economic growth and socio-financial empowerment in India's growing digital economy.

2. Keywords:-

Digital Payments, Financial Inclusion, FinTech, Economic Development, Financial Literacy, Unified Payments Interface

3. Introduction:-

The advent of digital technology has brought a paradigm shift in India's financial landscape, transforming the way individuals and businesses conduct monetary transactions. In this digital revolution, the Unified Payments Interface (UPI), introduced by the National Payments Corporation of India (NPCI) in 2016, has emerged as a groundbreaking innovation. UPI integrates multiple bank accounts into a single mobile application, enabling real-time, seamless, and cost-effective fund transfers. Supported by initiatives such as Digital India, Jan Dhan Yojana, and Cashless Economy, UPI has played a pivotal role in promoting financial inclusion by providing convenient and secure access to financial services.

India witnessed exponential growth in UPI transactions, driven by factors such as widespread smartphone usage, increased internet penetration, and proactive government policy support. The COVID-19 pandemic further accelerated the adoption of digital payment platforms, reinforcing the need for contactless and efficient payment systems. UPI has empowered millions of individuals, small traders, and self-employed workers by offering a transparent and inclusive financial ecosystem.

4. Review of Literature:-

Several studies and reports have highlighted the growing significance of digital payments and their impact on financial inclusion in India

- Demirgüç-Kunt et al. (2018), digital financial systems play a vital role in increasing access to banking services, especially among low-income populations.
- The Reserve Bank of India (RBI, 2021) reported that innovations like UPI and Aadhaar-enabled payment systems have accelerated financial inclusion by providing convenient and low-cost transaction options.
- Kapoor (2020) emphasized that mobile wallets and internet banking have empowered rural populations by reducing dependency on cash transactions.
- Singh and Gupta (2022) highlighted that digital payment systems promote transparency and reduce leakages in welfare schemes.
- Mishra (2019) pointed out persistent barriers such as inadequate digital infrastructure, lack of awareness, and cyber security threats, which limit inclusive growth.

Overall, the literature suggests that while digital payments have significantly contributed to financial inclusion in India, continued efforts in digital literacy and infrastructure development are essential for sustainable progress.

5. Objectives of the Study:-

5.1. To examine the growth and adoption trends of the Unified Payments Interface (UPI) in India

5.2. To analyse the role of digital payments in Person to person and Person to Marchant .

5.3. To identify the major factors influencing the use of digital payment platforms.

5.4. To identify the major challenges and limitations associated with UPI, including digital literacy, cyber security, and infrastructural issues.

6. Research Methodology:-

This study adopts an analytical and descriptive research design to examine the impact of the Unified Payments Interface (UPI) on financial inclusion in India. The research is primarily based on secondary data collected from credible and authentic sources such as the Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), NITI Aayog, Ministry of Finance reports, and relevant academic journals. The period of study spans from 2017-18 to 2023-24, covering the major years of UPI expansion and technological development in India's digital payment ecosystem.

The data used in the study includes UPI transaction volume (number of transactions) and value (in ₹ lakh crore), alongside overall digital transaction trends in India. According to NPCI data, UPI transactions grew exponentially from 0.1 billion transactions worth ₹1.01 lakh crore in 2017–18 to 8,376 crore transactions worth ₹139 lakh crore in 2022–23, marking a phenomenal annual growth rate of over 400% in transaction volume. Similarly, total digital payment transactions in India increased from 2,071 crore in 2017–18 to more than 13,462 crore in 2022–23, reflecting deepening digital penetration and user confidence.

A qualitative assessment was conducted by reviewing previous studies and policy documents to identify major challenges such as digital illiteracy, cybersecurity risks, and infrastructural barriers.

The methodology thus an analytical and descriptive research design to provide a comprehensive understanding of how UPI has transformed digital payments and contributed to inclusive financial growth. By analyzing secondary data and reviewing relevant literature, the study aims to present evidence-based insights and practical recommendations for strengthening India's digital payment ecosystem.

7. Methods of digital payment used in India:-

7.1 Unified Payments Interface (UPI)

- Real-time mobile-based payment system.
- Allows bank-to-bank transfers using UPI ID, QR code, or mobile number.
- Most widely used digital payment method in India.

7.2 Mobile Wallet

- Prepaid digital wallets such as PhonePe Wallet, Paytm Wallet, Amazon Pay, and Mobikwik.
- Allow quick payments without entering bank details each time.

7.3 Internet Banking (Net Banking)

- Online transfer methods like NEFT, RTGS, IMPS.
- Used for secure, large-value and business transactions.

7.4 Mobile Banking Apps

- Bank-specific apps
- Provide fund transfer, bill payments, balance enquiry and services.

7.5 Debit and Credit Cards

- ATM-cum-payment cards used for online payments and POS machines.
- Include Visa, MasterCard, Rupay cards.

7.6 Aadhaar Enabled Payment System (AePS)

- Biometric-based payment system for rural users.
- Allows withdrawals, balance checks, and transfers using Aadhaar authentication.

7.7 QR Code Payments

- Payments by scanning QR codes via UPI or wallet apps.
- Widely used by small merchants and street vendors.

7.8 Bharat Bill Payment System (BBPS)

- Unified platform for paying utility bills, DTH, electricity, gas, water, etc.

7.9 PoS (Point-of-Sale) Terminals

- Card swiping machines used in shops, malls, hotels, and retail outlets.

7.10 National Electronic Toll Collection (FASTag)

- RFID-based digital toll payment method for vehicles.

8. Major Factors Influencing the Use of Digital Payment

8.1 Internet and Smartphone Penetration

The availability of affordable smartphones and widespread internet access is a primary driver. As digital connectivity improves, more users—especially in rural and semi-urban areas—adopt digital payments.

8.2 Convenience and Ease of Use

Digital payment platforms like UPI, mobile wallets, and net banking provide instant, 24×7, hassle- free transactions. This convenience strongly motivates users to shift from cash to digital modes.

8.3 Government Policies and Digital India Initiatives

Government efforts such as UPI promotion, BHIM app, Aadhaar-enabled services, zero MDR for UPI, and awareness campaigns significantly encourage digital payment adoption.

8.4 Security and Trust in Technology

Improved cyber security, multi-factor authentication, OTP-based verification, and RBI regulations enhance user confidence in digital transactions.

8.5 Cashless and Contactless Benefits

During COVID-19, safety concerns increased preference for contactless digital payments. Even

8.6 Merchant Acceptance and QR Code Availability

Widespread installation of UPI QR codes at shops, markets, and street vendors has made digital payments universal and accessible.

8.7 Financial Literacy and Digital Awareness

Higher awareness of digital tools, apps, and online banking directly influences adoption. Training programs and youth familiarity with technology also contribute. after the pandemic, many users continue to rely on digital modes due to habit and safety.

8.8 Low Transaction Cost

Most digital platforms like UPI offer zero-cost payments, making them more attractive than traditional banking methods.

8.9 Speed and Real-Time Processing

Instant transfer capability, without delays or paperwork, makes digital payments more appealing for both individuals and businesses.

9. Hypothesis:-

- **H_0**: There is no significant relationship between the growth of the Unified Payments Interface (UPI) and the improvement in financial inclusion in India.
- **H_1**: There is a significant positive relationship between the growth of the Unified Payments Interface (UPI) and the improvement in financial inclusion in India.

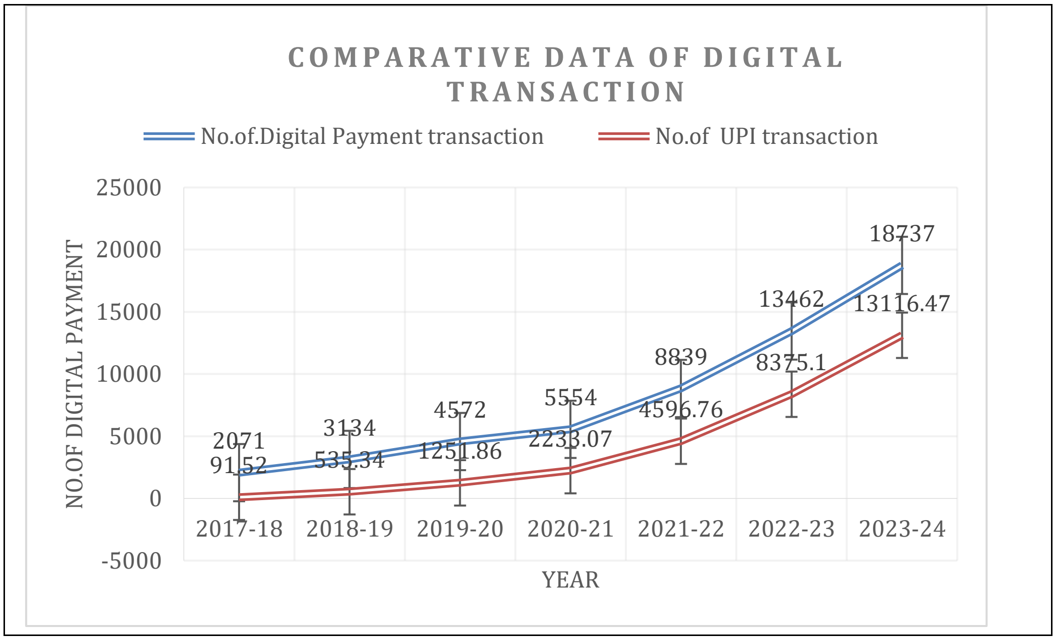
10. Analysis and conclusions of the statistical data obtained from total digital payments and UPI from 2017-18 to 2023-24.

In the present research paper, secondary statistical data related to digital payments and UPI transactions has been obtained from Reserve Bank of India (RBI), NPCI and government publications. The data obtained has been presented in tabular and graphical form. Also, the share of UPI in total digital transactions has been determined and analyzed and conclusions have been drawn.

10.1 Comparative data of Digital transaction and UPI transaction(In crore)

Year	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
No.of.Digital Payment transaction	2071	3134	4572	5554	8839	13462	18737
No.of UPI transaction	91.52	535.34	1251.86	2233.07	4596.76	8375.10	13116.47
% of DT	4.42%	17.08%	27.38%	42.21%	52%	62.21%	70%

Source: RBI, NPCI & Banks



India's digital payment ecosystem has experienced remarkable expansion between 2017-18 and 2023-24, driven by rapid technological adoption, supportive government policies, and changing consumer behaviour. Total digital payment transactions increased from 2071 crore to 18,737 crore, showing a nearly ninefold rise in just seven years. This surge reflects wider smartphone penetration, low-cost internet, formalisation of the economy, and the increasing comfort of users and merchants with cashless methods. Among all modes, the most transformative development has been the extraordinary rise of the Unified Payments Interface (UPI).

UPI transactions grew from only 91.52 crore in 2017-18 to 13,116.47 crore in 2023-24, making it the dominant force in India's digital payments landscape. Its share in total digital transactions rose from 4.42% to 70%, indicating a major structural shift away from traditional card-based and bank transfer systems. UPI's convenience, real-time settlements, QR-code simplicity, and zero transaction cost have encouraged adoption across urban as well as rural markets, from organised retailers to small street vendors.

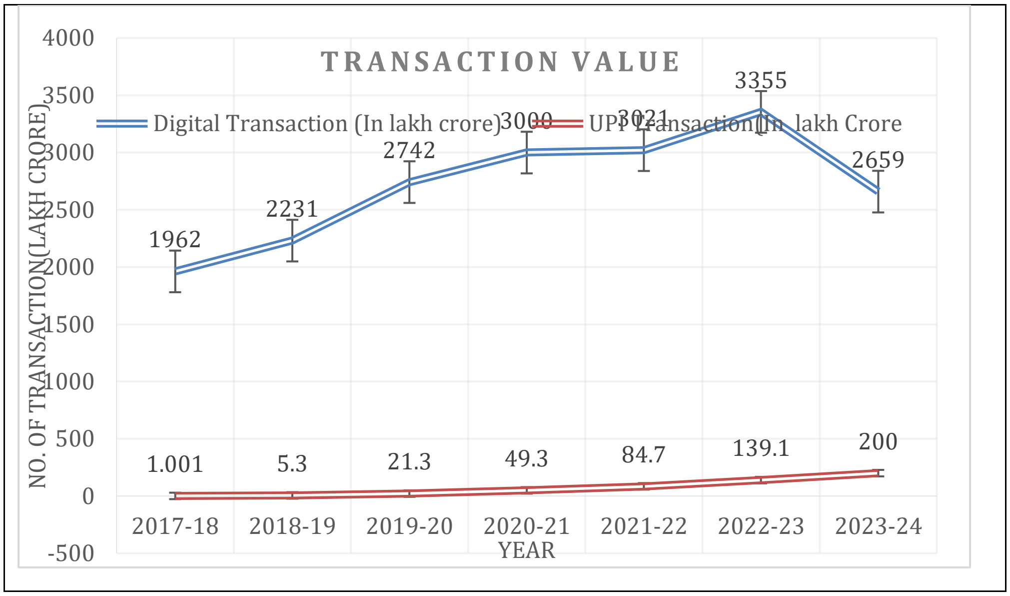
The post-pandemic period further accelerated digital usage, as people preferred contactless and secure payment methods. Government initiatives such as the Digital India Mission, JAM trinity, and NPCI-led innovations also strengthened the ecosystem, enabling seamless payments at scale. Overall, the data highlights a profound transformation in India's financial behaviour, where digital payments—especially UPI—are not only replacing cash transactions but also promoting transparency, financial inclusion, and economic efficiency. India has emerged as a global leader in digital finance, and UPI continues to be the backbone of this growth.

10.2 Table:- Number of Digital Transaction (Value) in india

Year	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Digital Transaction (In lakh crore)	1962	2231	2742	3000	3021	3355	2659

UPI Transaction(In lakh Crore	1.01	5.3	21.3	49.3	84.7	139.1	200

Source: RBI, NPCI & Banks



India's digital payment landscape has witnessed a remarkable shift not only in volume but also in the value of transactions over the seven-year period from 2017-18 to 2023-24. The total value of digital transactions increased from ₹1,962 lakh crore in 2017-18 to ₹3,355 lakh crore in 2022-23, reflecting steady growth driven by expanding digital infrastructure, wider internet access, and the increasing preference for electronic payment systems. Although the value marginally dropped to ₹2,659 lakh crore in 2023-24, the broader trend still indicates a strong long-term upward trajectory. This decline may be attributed to shifting transaction patterns, reduced high-value RTGS transactions, and the growing dominance of low-ticket UPI payments.

The most significant transformation appears in the value of UPI transactions, which skyrocketed from ₹1 lakh crore in 2017-18 to ₹200 lakh crore in 2023-24. This represents an extraordinary expansion, making UPI the central pillar of India's digital economy. UPI's share in the total digital transaction value has grown from negligible levels to a substantial proportion, highlighting the acceptance of UPI for both small and increasingly larger payments. The surge reflects UPI's convenience, interoperability, real-time settlement capability, and zero-cost structure, which have encouraged adoption across all sections of society, including small businesses and rural users.

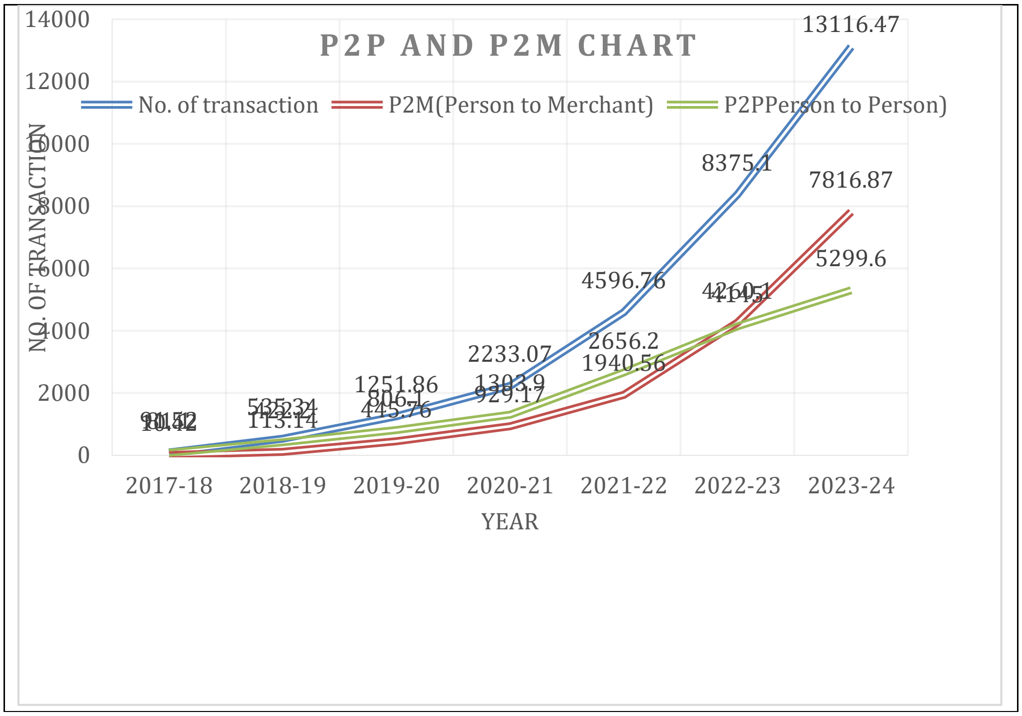
Overall, the data demonstrates a fundamental shift in India's payment behaviour, where UPI has emerged as a powerful driver of digital financial transactions. The trend underscores India's progress toward a more transparent, inclusive, and digitally empowered economy.

10.3 Table Number of UPI transaction (Volum-in crore) in india

Year	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
P2M(Person to Merchant)	10.42	113.14	445.76	929.17	1940.56	4260.10	7816.87

P2P(Person to Person)	81.10	422.20	806.10	1303.90	2656.20	4145.00	5299.60
Total UPI Transaction	91.52	535.34	1251.86	2233.07	4596.76	8375.10	13116.47

Source: RBI, NPCI & Bank



The analysis of UPI transaction data from 2017–18 to 2023–24 reveals a remarkable and consistent upward trend in digital payment adoption across India. The first graph, which represents total UPI transactions, shows exponential growth from 91.52 crore transactions in 2017–18 to 13,116.47 crore in 2023–24**.** This continuous rise reflects the rapid digital transformation taking place in India, driven by increasing smartphone usage, affordable internet, and strong government initiatives promoting cashless transactions. The noticeable surge after 2019–20 also indicates the influence of the COVID-19 pandemic, which accelerated the shift toward contactless digital payments for safety and convenience.

The second graph compares Person-to-Person (P2P) and Person-to-Merchant (P2M) transactions. Both categories show a strong upward movement, confirming widespread adoption of UPI for various financial activities. P2P transactions grew from 81.10 crore to 5,299.60 crore, indicating greater trust in digital peer transfers for everyday financial needs. However, the growth of P2M transactions—from 10.42 crore to 7,816.87 crore—is even more significant. This reflects increasing acceptance of UPI among merchants, small businesses, street vendors, and retail sectors, supported by zero MDR, easy QR integration, and quick settlement features. The rapid rise of P2M transactions demonstrates that UPI has not only transformed personal payments but has also become a dominant mode in commercial transactions.

Overall, the data and graphs highlight UPI's pivotal role in driving digital inclusion, reducing cash dependency, and strengthening transparency in financial transactions. The upward trends clearly show that UPI has evolved into a powerful digital infrastructure that is reshaping India's financial ecosystem.

11.Major Challenges and Limitations Associated with UPI

Despite the exponential growth and transformative impact of UPI on India's digital payment ecosystem, several challenges and limitations continue to hinder its universal adoption and smooth functioning.

11.1 Digital Literacy and Awareness

A significant segment of the population, especially in rural and remote areas, still lacks adequate digital literacy. Many users are unfamiliar with smartphones, payment apps, QR codes, or basic security practices. This creates hesitation, fear of fraud, and low confidence in using UPI for financial transactions.

11.2 Cyber security Risks and Fraud

With rapid digital adoption, UPI has also seen an increase in cyber frauds such as phishing, screen-sharing scams, fake customer-care numbers, and malicious apps. Users with limited awareness are particularly vulnerable. Although UPI itself is secure, human-level vulnerabilities pose major risks.

11.3 Network and Infrastructure Limitations

Stable internet connectivity remains a challenge in many parts of India. Poor network coverage leads to transaction delays, failures, or timeouts, affecting user trust. Additionally, smartphones with limited storage or outdated operating systems restrict many people from accessing UPI apps.

11.4 Over dependence on Third-Party Apps

Most users rely on third-party UPI apps like Google Pay, PhonePe, and Paytm. System downtimes, app glitches, or server overloads can disrupt large volumes of transactions, affecting reliability.

11.5 Safety and Privacy Concerns

Concerns related to data privacy, app permissions, and misuse of personal information discourage some users from fully adopting UPI. Clear regulatory frameworks and transparent data practices are still evolving.

11.6 Merchant Adoption Barriers

While UPI acceptance among merchants is growing, small vendors sometimes resist due to fear of tax scrutiny, limited banking knowledge, or preference for cash. Additionally, device affordability is still an issue for micro-businesses.

12. Conclusion of the Study

The study concludes that the Unified Payments Interface (UPI) has emerged as a transformative force in India's digital payment landscape and has significantly contributed to strengthening financial inclusion. Analysis of secondary data from 2017 to 2024 reveals that digital transactions have grown consistently, but the growth trajectory of UPI is exceptionally steep. UPI has evolved from a marginal share of total digital transactions to contributing nearly 70% of the country's digital payments by 2023–24. This reflects its widespread acceptance, ease of use, interoperability, and real-time processing features that make it accessible even to first-time digital users.

The findings highlight that UPI has not only accelerated India's transition toward a cashless economy but has also democratized financial access by reaching rural populations, small merchants, and low-income groups. Despite challenges such as digital literacy gaps, cybersecurity concerns, and uneven infrastructure, the overall impact remains overwhelmingly positive.

The study concludes that UPI is more than a technological innovation—it is a catalyst for economic empowerment, transparency, and inclusive financial growth. Strengthening digital infrastructure, improving awareness, and enhancing security mechanisms will be essential to sustain this momentum and achieve a fully digitally-enabled financial ecosystem in India.

13.References:-

1. Reserve Bank of India. (2018–2024). RBI Annual Reports. Mumbai: RBI.

2. National Payments Corporation of India. (2016–2024). UPI Product Statistics and Reports. *NPCI.*

3. Ministry of Electronics and Information Technology (MeitY). (2023). Digital Payments Annual Report. Government of India.

4. Reserve Bank of India. (2023). Payment and Settlement Systems in India: Journey in the Digital Era. Mumbai: RBI.

5. NPCI. (2022). Unified Payments Interface (UPI) System Overview. NPCI Publications.

6. NITI Aayog. (2021). India's Digital Payment Revolution. Government of India.

7. Mehta, A., & Singh, R. (2020). "Digital Payments and Financial Inclusion in India." International Journal of Economics and Finance, 12(4), 45–54.

8. Kumar, V., & Arora, S. (2021). "UPI Adoption and User Perception in India." Journal of Banking and Finance Research, 18(2), 90–101.

9. Deloitte. (2022). Digital Payments Landscape in India: Trends and Future Outlook. Deloitte Insights.

10.PwC India. (2021). The Future of Digital Payments in India. PwC Research Publications.

11. World Bank. (2022). Global Findex Database 2021: Financial Inclusion Insights. Washington, D.C.: World Bank Group.

12. OECD. (2020). Digital Financial Services and Consumer Protection. OECD Publishing.

13.Singh, P., & Gupta, S. (2019). "Impact of Mobile Payments on Financial Inclusion." Asian Journal of Finance & Accounting, 11(3), 112–128.

14. EY India. (2023). FinTech Adoption Index India Report. Ernst & Young.

15. Economic Survey of India. (2022–23). Digital India and Financial Inclusion. Ministry of Finance, Government of India.

16. Jain Aasima,.(2025). "Digital payments in India: Trends, growth analysis and future prospects". International Journal of Research in Finance and Management 2025; 8(2): 444-449