MAINS iMPACT 2025   **25-07-2025**

UNIFIED PAYMENT INTERFACE (UPI)

SYLLABUS:

GS 3> Economic Development > Indian Economy and Issues > Banking sector

REFERENCE NEWS:

o India has emerged as the global leader in fast payments, according to a recent note by the International Monetary Fund titled **Growing Retail Digital Payments: The Value of Interoperability.** At the heart of this transformation is the **Unified Payments Interface**, better known as UPI.

o **Launched in 2016** by the **National Payments Corporation of India**, UPI has changed how people send and receive money in the country.

Key Takeaways

- IMF notes that India is the **global leader in fast payments.**
- ₹24 lakh crore processed via **18.39 billion UPI transactions** in June 2025.
- UPI Powers **85% of India's digital payments** and nearly 50% globally.
- UPI handles **640+ million transactions daily**, ahead of Visa.

WHAT IS UPI?

o Unified Payments Interface (UPI) is a **real-time payment system** that enables instant money transfers between bank accounts through a mobile application.

o It is built on the **Immediate Payment Service (IMPS)** infrastructure.

o UPI **brings multiple bank accounts into a single app** and supports various features such as **fund transfers, merchant payments, and peer-to-peer payment requests**, making digital transactions quick and convenient.

o . Today, **UPI processes over 18 billion transactions every month** in India.
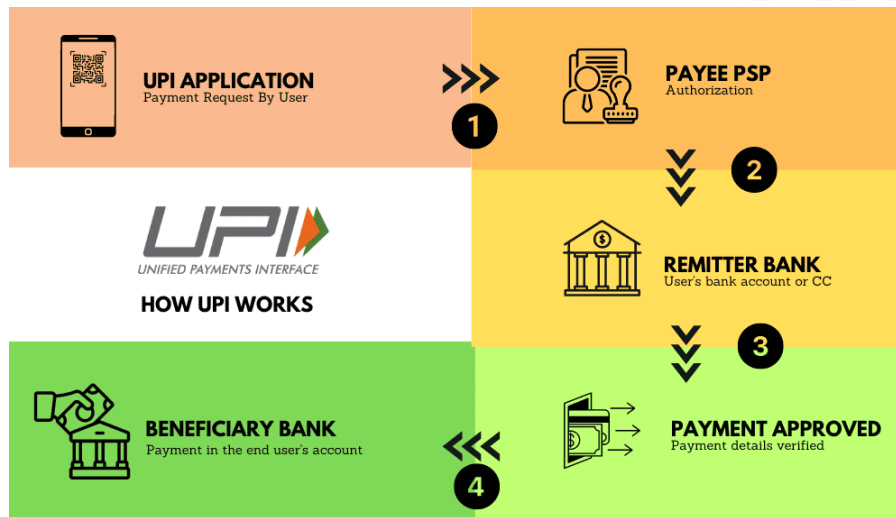
HOW UPI WORKS

HOW UPI TRANSFORMED INDIA'S DIGITAL PAYMENT ECOSYSTEM:

- o **Unprecedented Scale and Speed:**
  - o In **June 2025**, UPI processed **₹24.03 lakh crore** across **18.39 billion transactions**, marking a **32% year-on-year increase** from **13.88 billion transactions in June 2024**.
  - o UPI currently facilitates **~18 billion transactions per month**, becoming the **backbone of India's digital payments ecosystem**. It accounts for **~85% of India's retail digital payment volumes**.
  - o With **640+ million transactions daily**, UPI has surpassed Visa's **639 million daily transactions**, becoming the **world's largest real-time payments system**. (Source: NPCI)
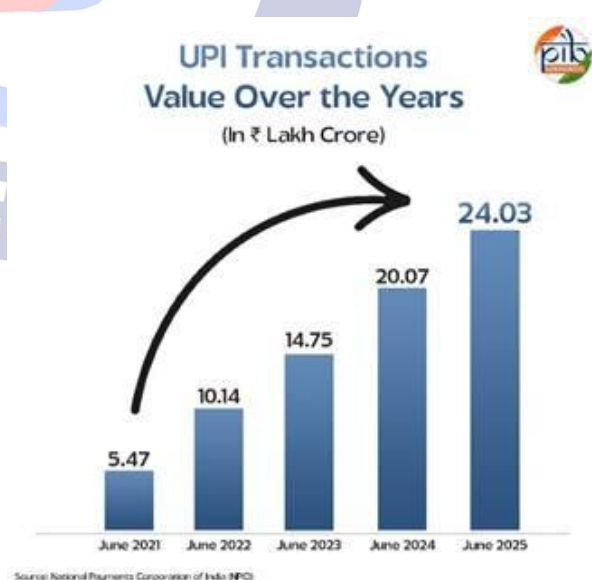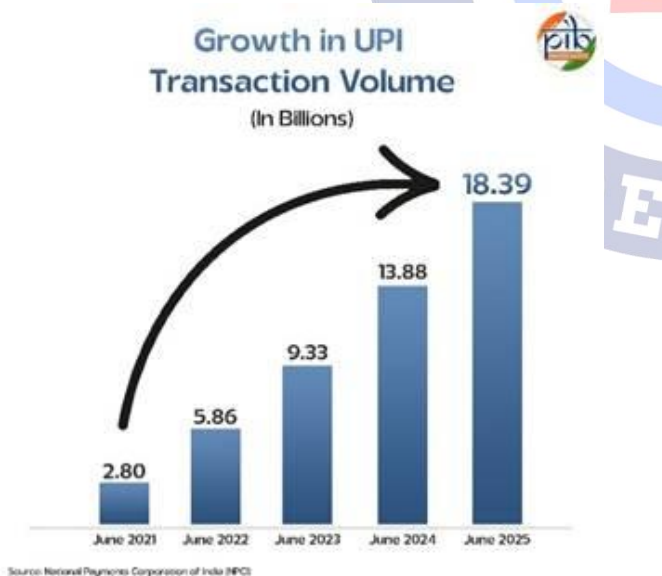
- o **Interoperability as the Core Driver:**
  - o **Before UPI**, digital payments were dominated by **closed-loop wallets** and card networks with limited compatibility.
  - o UPI created a **single, open, and interoperable framework**, allowing any bank account to be linked to any UPI-enabled application. This **reduced switching costs**, fostered **healthy competition among payment service providers**, and improved user experience.

o The IMF notes that **UPI's open and standardized API ecosystem** is a global benchmark for interoperability and inclusion.

Structure of
UPI vs Closed-Loop Payment Systems

Source: IMF
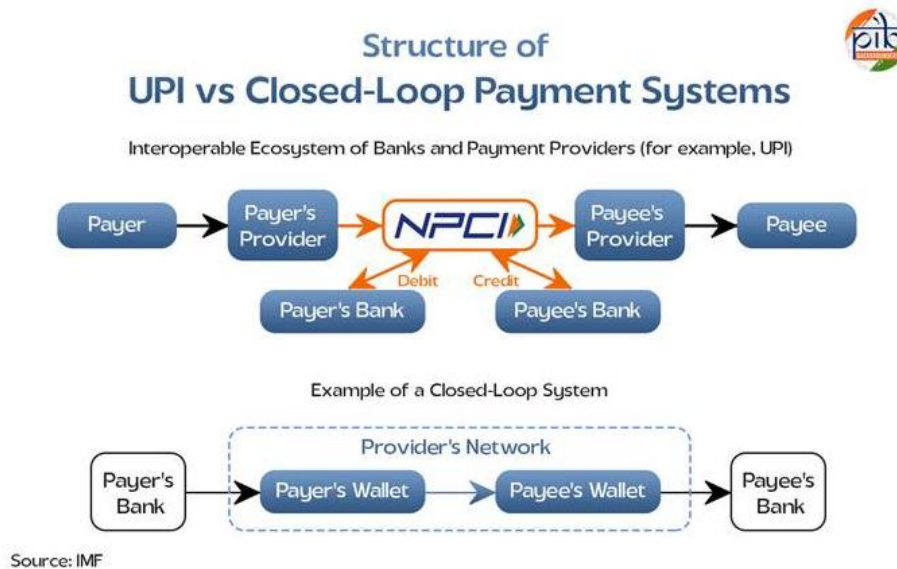
o **Foundation of Inclusion: Jan Dhan, Aadhaar, and Digital Infrastructure:**
  o **Pradhan Mantri Jan Dhan Yojana (PMJDY):** As of **9 July 2025**, over **55.83 crore Jan Dhan accounts** have been opened, giving millions access to banking and digital services.
  o **Aadhaar Digital Identity:** With **142 crore Aadhaar cards issued by 30 June 2025**, India has built a universal biometric identity system that simplifies authentication and eKYC for UPI transactions.
  o **Telecom and Connectivity Revolution:**
    ▪ India has achieved one of the **fastest 5G rollouts globally**, with **4.74 lakh 5G base stations** covering almost all districts.
    ▪ The country boasts a **mobile subscriber base of 116 crore (2025)**.
    ▪ Data costs fell drastically from ₹**308 per GB (2014)** to ₹**9.34 per GB (2022)**, enabling affordable access to digital platforms.
o **Merchant Digitization and SME Empowerment:**
  o UPI's **QR code infrastructure** has enabled **even small vendors and neighborhood shops** to accept payments with minimal cost.
  o **No Merchant Discount Rate (MDR)** for most UPI payments has encouraged rapid merchant adoption.
  o Digital trails from UPI payments have improved **credit availability for MSMEs** via **data-based underwriting** and embedded finance.
o **Global Expansion of UPI:**
  o UPI is now **live in seven countries**: **UAE, Singapore, Bhutan, Nepal, Sri Lanka, France, and Mauritius**.
  o Its **entry into France** is a milestone, marking UPI's **first European expansion**.
  o The **UPI-PayNow linkage** with Singapore enables **instant cross-border remittances**.

- UPI is being pitched as a **payment standard for BRICS+**, potentially benefiting **remittance flows and financial inclusion** in partner nations.
- **PayPal World is expected to integrate with UPI by the end of 2025**, extending its global reach.
- **Behavioral and Economic Impact:**
  - **Shift from cash to digital:** Decline in ATM withdrawals aligns with the surge in UPI usage, indicating a **structural shift toward a cashless economy**.
  - **Card displacement:** Daily UPI transaction volumes now surpass Visa and Mastercard, reducing reliance on card-based payments.
  - **Government payments and subsidies:** UPI is being leveraged for **direct benefit transfers (DBTs)**, ensuring transparency and reduced leakages.
- **Product Innovations on the UPI:**
  - **UPI Lite and UPI Lite X:**
    - Introduced **on-device wallets** for faster micro-transactions, reducing load on core banking systems. **Offline and proximity payments** are now possible through Lite X. NPCI raised **UPI Lite transaction limits**, making micro-payments up to ₹1,000 per transaction and ₹5,000 cumulative feasible.
  - **UPI 123PAY:** Extends UPI to **feature phone users** through **IVR-based, soundbox, and missed-call payment solutions**, bridging rural inclusion gaps.
  - **Hello! UPI:** A **voice-enabled conversational platform** supporting multiple Indian languages, designed to serve elderly users and first-time digital adopters.
  - **Credit and Value-Added Servic:** Features such as **UPI AutoPay, recurring mandates, credit on UPI, and IPO/ASBA integration** have transformed UPI into a **multi-functional financial ecosystem**.
- **Policy and Regulatory Design Behind UPI's Success:**
  - **NPCI as a neutral public utility** provided an **open, non-proprietary payments infrastructure**.
  - **Open APIs and standardized protocols** encouraged fintech innovation and integration.
  - **Agile regulation** by the RBI and NPCI (e.g., UPI Lite limit enhancements, fraud control mechanisms) ensured both safety and scalability.
  - The UPI model demonstrates the **value of public digital infrastructure** for driving financial inclusion at scale.

CHALLENGES AND CONCERNS ASSOCIATED WITH UPI:

- **Financial Sustainability and Zero-MDR Issue:**
  - UPI transactions have **zero Merchant Discount Rate (MDR)**, meaning neither merchants nor users pay transaction fees. While this policy has promoted rapid adoption, it raises **concerns about the long-term sustainability** of the payment ecosystem.
  - Banks, payment service providers (PSPs), and fintech companies are incurring high operational costs (fraud prevention, infrastructure upgrades) with **no revenue incentives**, creating a funding gap.

- The RBI Governor has stressed that UPI must move towards a **sustainable cost model** to ensure continued innovation and infrastructure resilience.
- **Market Concentration and Platform Dominance:**
  - **"Duopoly" Concerns: PhonePe (~48%) and Google Pay (~37%) handle over 85% of UPI transactions**. This concentration poses **systemic risks**, reduces bargaining power for smaller players, and raises questions about innovation and competition.
  - **NPCI's Delayed 30% Cap:** NPCI's plan to impose a 30% cap on individual third-party app providers' market share has been **repeatedly deferred**, highlighting execution challenges.
- **Rising Fraud and Social Engineering Scams:**
  - As per the Finance Ministry data tabled in the Lok Sabha, **1.34 million UPI fraud cases in FY24**, with total losses amounting to **₹1,087 crore**.
  - A survey (Mar–Jun 2025) shows **1 in 5 UPI users** have faced scams since 2022, with **40% falling for phishing links** and **50% for PIN-compromise attacks**.
  - **Examples:** A vegetable vendor in Junagadh lost **₹1.86 lakh** due to fake payment confirmations. Also, a government employee in Delhi was defrauded of **₹20 lakh** through unauthorized UPI transfers.
  - **Instant and Irrevocable Nature:** Once a UPI payment is made, **funds cannot be reversed easily**, complicating grievance redressal.
- **Cybersecurity and Data Protection Gaps:**
  - UPI apps collect sensitive personal and transactional data, but **India's data protection laws are still evolving**, creating ambiguity in user consent and data sharing.
  - A recent **Karnataka High Court case involving PhonePe** revealed the tension between user privacy and law enforcement access.
  - Financial platforms are high-value targets for **malware, ransomware, and phishing attacks**.
  - For instance, in 2024, a ransomware attack on **C-Edge (a banking tech provider)** disrupted payment services, exposing vulnerabilities in supply chains.
  - **Critical Infrastructure Risks:** UPI's scale means **even short outages affect millions of users**. In April 2025, UPI faced a major outage for **nearly 5 hours**, reducing success rates to **50%** due to API overload.
- **Reliability and Scale Stress:**
  - With over **640 million daily transactions**, the system faces performance bottlenecks. April–May 2025 saw multiple outages caused by **API rate-limiting issues** and high transaction volumes.
  - While NPCI has robust infrastructure, **failover mechanisms and transparent post-incident reporting** need strengthening to maintain trust.
- **Digital Divide and Accessibility Challenges:**
  - Despite **UPI Lite X and 123PAY** enabling offline and feature-phone payments, **network issues, power outages, and smartphone penetration gaps** still limit adoption in rural areas.

- o Elderly users and first-time adopters are more **susceptible to scams due to lack of awareness** about **safe payment practices**.
- o **Cross-Border and Regulatory Challenges:**
  - o UPI is now live in **7 countries (France, UAE, Singapore, etc.)**, but cross-border payments face **foreign exchange, compliance, and settlement complexities**.
  - o Cross-border corridors need clear **data protection agreements** to prevent misuse of user data.
- o **Consumer Grievance Redressal:**
  - o With no unified chargeback mechanism like credit cards, **resolving disputes can take weeks**, eroding user confidence.
  - o New rules for auto-acceptance and rejection of chargebacks are being introduced, but awareness and execution remain limited.
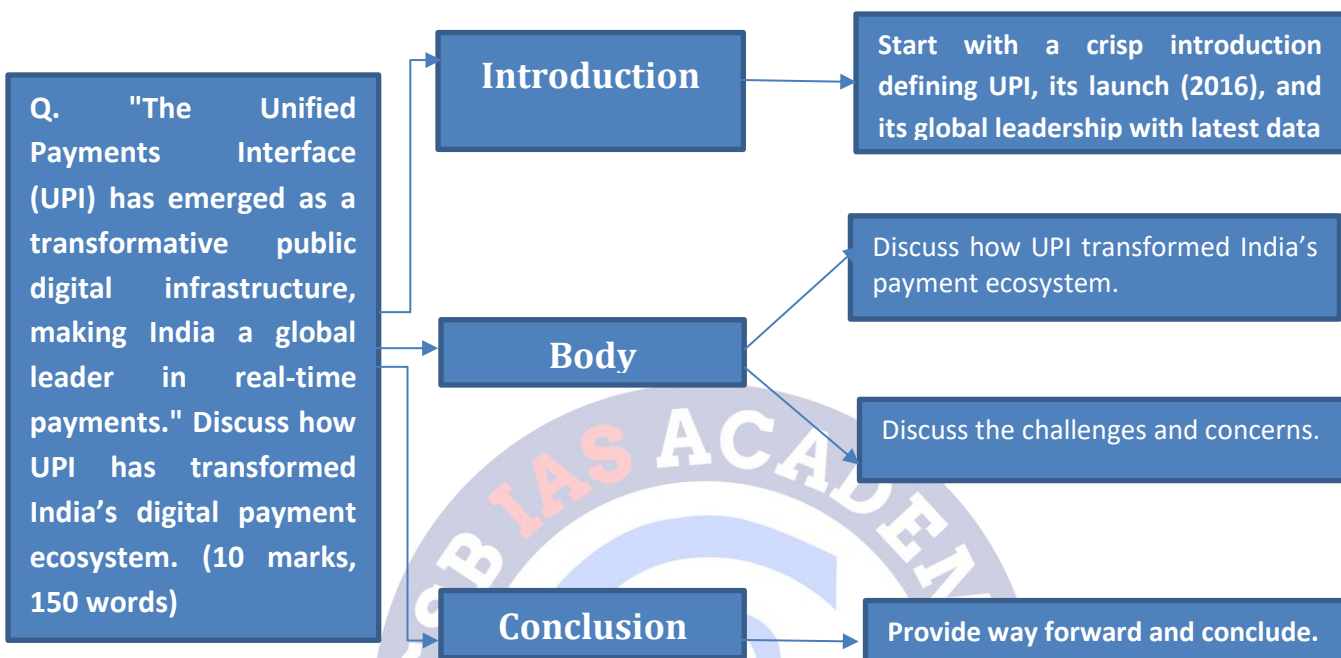
WAY FORWARD:

- o **Sustainable Economic Model:** Introduce a minimal, regulated MDR or infrastructure fee, or government-backed subsidies, to ensure long-term viability and innovation within the UPI ecosystem.
- o **Strengthening Cybersecurity:** Implement AI-driven fraud detection, proactive anomaly tracking, and periodic cybersecurity audits to mitigate phishing and ransomware attacks.
- o **Robust Data Protection Framework:** Enforce strong data privacy laws, consent-based data usage, and anonymization protocols to build user trust.
- o **Enhancing Infrastructure Resilience:** Invest in server redundancy, real-time outage monitoring, and transparent incident reporting to maintain reliability at high transaction volumes.
- o **Promoting Digital Literacy:** Launch nationwide campaigns in regional languages to educate users, especially first-time adopters, on safe UPI practices and fraud prevention.
- o **Deconcentration Measures:** NPCI should implement phased caps or incentivize new players to avoid over-reliance on a duopoly and foster innovation.
- o **Cross-Border Frameworks**: Establish standardized rules for foreign exchange, compliance, and data security to scale UPI's global expansion safely.
- o **Improving Grievance Redressal:** Introduce time-bound dispute resolution mechanisms and real-time refund tools for unauthorized transactions.
- o **Strengthen Data Privacy and Governance**: Enforce strict compliance with the DPDP Act 2023 for UPI platforms, including consent-based data use, encryption, anonymization, and periodic security audits to prevent misuse or unauthorized access to financial data.

CONCLUSION

- o UPI has revolutionized India's digital payments, achieving global recognition for its scale, interoperability, and inclusivity. Addressing challenges related to sustainability, cybersecurity, and infrastructure resilience will be key to ensuring that UPI continues to drive a secure, reliable, and future-ready digital economy.

PRACTICE QUESTION:

Q. "The Unified Payments Interface (UPI) has emerged as a transformative public digital infrastructure, making India a global leader in real-time payments." Discuss how UPI has transformed India's digital payment ecosystem. (10 marks, 150 words)

APPROACH:

```
Q. "The Unified Payments Interface (UPI) has emerged as a transformative public digital infrastructure, making India a global leader in real-time payments." Discuss how UPI has transformed India's digital payment ecosystem. (10 marks, 150 words)
```

Introduction → Start with a crisp introduction defining UPI, its launch (2016), and its global leadership with latest data

Body → Discuss how UPI transformed India's payment ecosystem.

→ Discuss the challenges and concerns.

Conclusion → Provide way forward and conclude.

MODEL ANSWER:

The Unified Payments Interface (UPI), launched in 2016 by the National Payments Corporation of India (NPCI), is a real-time payment system that enables instant money transfers between bank accounts through mobile apps, built on the Immediate Payment Service (IMPS) infrastructure. According to the IMF report *"Growing Retail Digital Payments: The Value of Interoperability"* (2025), **India has become the global leader in fast payments**, with **UPI processing ₹24.03 lakh crore across 18.39 billion transactions in June 2025 alone**, accounting for **~85% of India's retail digital transactions** and surpassing Visa in daily transaction volumes (640+ million/day).

How UPI Transformed India's Digital Payment Ecosystem:

1. Unprecedented Scale and Speed
- UPI processes **~18 billion transactions monthly**, with transaction volumes increasing by **32% YoY (June 2024–2025)**, making it the **world's largest real-time payments system**.

2. Interoperability as the Core Driver
- UPI created an open, standardized API framework that integrates multiple bank accounts on a single platform, breaking the silos of closed wallets and card networks, and is now recognized as a **global benchmark for digital payment interoperability** (IMF).

3. Financial Inclusion and Digital Infrastructure

- **55.83 crore Jan Dhan accounts (July 2025)** and **142 crore Aadhaar IDs (June 2025)** have enabled seamless eKYC and onboarding.
- Affordable connectivity (data costs down from ₹308/GB in 2014 to ₹9.34/GB in 2022) and **116 crore mobile subscribers** have ensured wide access.

4. Merchant Digitization and SME Empowerment

- QR code infrastructure has allowed even small vendors and neighborhood shops to accept digital payments at minimal cost, while digital transaction trails help MSMEs access formal credit.

5. Product Innovations

- **UPI Lite & Lite X:** Offline and proximity payments for microtransactions (up to ₹1,000 per transaction).
- **UPI 123PAY:** Enables feature-phone payments via IVR and missed calls.
- **Hello! UPI:** Voice-enabled platform in multiple Indian languages.
- Value-added features like **AutoPay, recurring mandates, and credit on UPI** have broadened UPI's utility.

6. Global Expansion

- UPI is operational in **7 countries** (e.g., UAE, Singapore, France) and linked to **PayNow for cross-border remittances**.
- Integration with **PayPal World (2025)** will further globalize India's payment architecture.

Challenges and Concerns:

1. Financial Sustainability: Zero-MDR policy has created a funding gap for banks and PSPs, threatening long-term infrastructure upgrades.

2. Market Concentration: PhonePe (~48%) and Google Pay (~37%) account for over **85% of UPI transactions**, creating a duopoly risk.

3. Rising Fraud and Social Engineering: 1.34 million fraud cases in FY24, with losses amounting to **₹1,087 crore**. Instant payments make **fraud resolution difficult**.

4. Cybersecurity and Data Protection Gaps: In 2024, a **ransomware attack on C-Edge** disrupted banking services. UPI apps collect sensitive data amid evolving data protection norms.

5. Reliability and Scale Stress: Outages in April–May 2025 affected millions, with success rates falling to **50%** due to API overload.

6. Digital Divide: Rural network issues, power cuts, and limited smartphone access hinder universal adoption.

7. Cross-Border Regulatory Complexities: Issues with foreign exchange norms and data-sharing agreements challenge UPI's international expansion.

Way Forward:

- **Sustainable Economic Model:** Introduce a nominal, regulated MDR or government-backed infrastructure subsidy to ensure operational viability.

- **Robust Cybersecurity Framework:** Use **AI-based fraud detection, multi-factor authentication**, and periodic cybersecurity audits.
- **Compliance with DPDP Act 2023:** Enforce **consent-based data usage, encryption, and anonymization** to build user trust.
- **Infrastructure Resilience:** Upgrade servers, implement **redundancy systems**, and ensure real-time outage reporting.
- **Digital Literacy Drives:** Educate users, especially rural and first-time users, about **safe UPI practices**.
- **Deconcentration Measures:** Promote competition by supporting smaller payment apps and enforcing NPCI's **30% market-share cap**.
- **Cross-Border Frameworks:** Align with global standards for **FX, compliance, and data protection** to boost international UPI adoption.
- **Efficient Grievance Redressal:** Introduce a **time-bound chargeback mechanism** and improve consumer dispute resolution systems.

UPI has **revolutionized India's digital payment landscape**, driving financial inclusion, reducing cash dependency, and setting a global benchmark for real-time payments. However, to maintain this trajectory and ensure long-term trust, India must focus on **sustainability, data security, and resilience**, positioning UPI as a **future-ready, secure, and globally scalable payment infrastructure**.