

Agpaytech's Research
3rd January, 2024

Feasible Payment Horizons

Integrating India's UPI to Payment Systems in Africa



Summary

The development of digital retail payment interoperability is essential in today's globalizing economies to enhance the smooth flow of remittance and cross-border transactions. Interlinking national payment system infrastructures (PSIs) among regions and countries is an important step towards financial inclusion and global business ties. As a result, there has been increased interoperable national payment systems such as UPI-PayNow, PayNow-DuitNow, PayNow-PromptPay, and other global initiative like SWIFT's GPI, Alipay+, PAPSS, multi-CBDC projects, etc.

This report offers case study insight into UPI international to African countries, its potentials and its roadmap. India's UPI launched in 2016 with 21 banks has expanded to 516 live banks, enabling billions of digital transactions each month. The total value of UPI transactions in November 2023 saw a 46% YoY growth and a 35% increase in live banks. Today, UPI has transcended its initial purpose within India, gaining acknowledgment and interest on the global stage including France, Australia, Singapore, UAE, Saudi Arabia, Oman, Nepal, Bhutan, Sri Lanka, and others.

However, no country or payment service provider in Africa has officially announced to be connecting to India's UPI. Meanwhile, many central banks in Africa have set up subsidiaries of innovative centers like India's NPCI to develop a robust instant retail payment system like the Central Bank of Ghana's GhIPSS and Central Bank of Nigeria's NIBSS capable of interlinking to UPI technology. UPI expansion to Africa is feasible and would be in the best interest of addressing cross-border e-commerce and trade payment challenges among partnering countries. The report set up a roadmap and architectural framework that could connect UPI to the African country payment system perhaps in the interest of GhIPSS, NIBSS, SARB's PayShap, PAPSS, etc.



This report offers technical insight into India's UPI and the possibilities for payment systems in Africa to connect, enabling billions of digital transactions.

Abbreviations

AEPS	- Aadhar Enabled Payments Service
AML	- Anti-Money Laundering
APBS	- Aadhaar Payment Bridge System
API	- Application Programming Interface
CBDCs	- Central Bank Digital Currencies
CFT	- Countering the Financing of Terrorism
EFT	- Electronic Fund Transfer
FEMA	- Foreign Exchange Management Act
FinTech	- Financial Technology
FPS	- Faster Payments System
GDP	- Gross Domestic Product
GhIPSS	- Ghana Interbank Payment and Settlement Systems Limited
GIP	- GhIPSS Instant Pay
IBA	- Indian Banks' Association
IMPS	- Immediate Payment Service
IPS	- Instant Payment System
MNOs	- Mobile Network Operators
NEFT	- National Electronic Funds Transfer
NFI	- Non-Financial Institution
NIBSS	- Nigeria Inter-Bank Settlement System
NIBSS NIP	- NIBSS Instant Payment
NPCI	- National Payments Corporation of India
NRE	- Non-Resident External Account
PIN	- Personal Identification Number
POS	- Point-of-Sale
PPI	- Prepaid Payment Instrument
PSI	- Payment System Infrastructure
PSP	- Payment Service Provider
QR Code	- Quick Response Code
RBI	- Reserve Bank of India
RTGS	- Real-Time Gross Settlement
SARB	- South African Reserve Bank
SWIFT's GPI	- SWIFT's Global Payments Innovation
UPI	- Unified Payment Interface
USSD	- Unstructured Supplementary Service Data
VPA	- Virtual Payment Address

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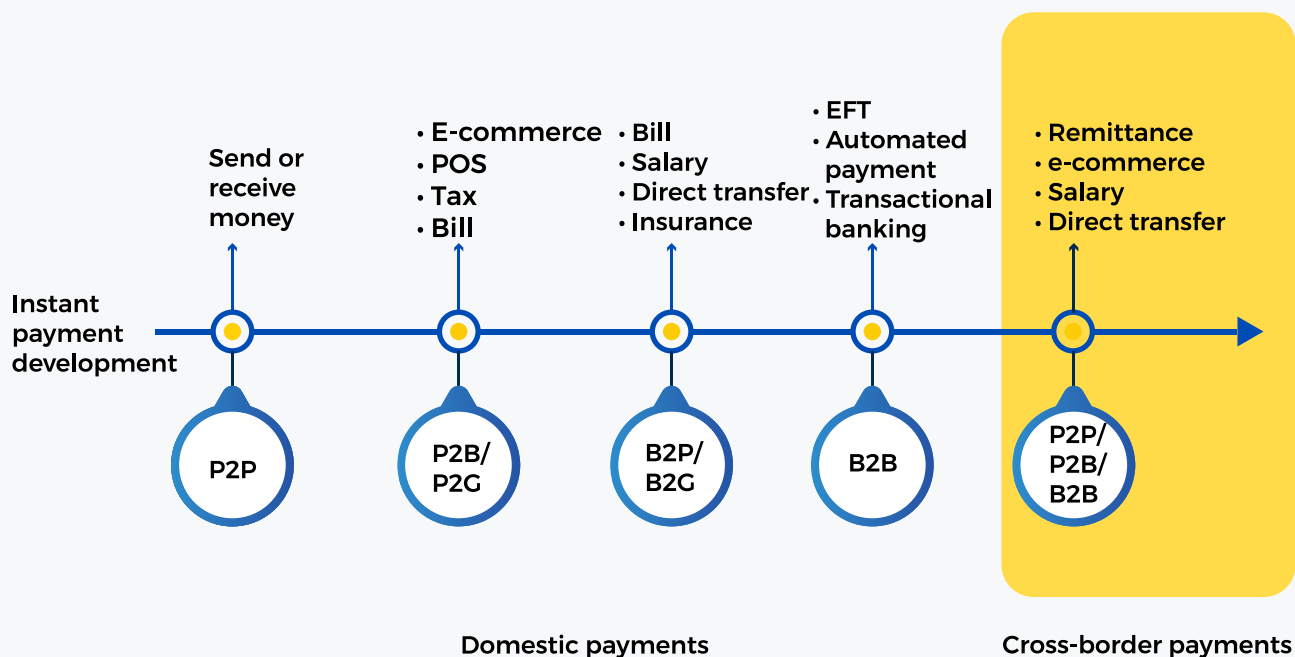
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Evolution of Fast Payment & Public Unified Payments

The global development of fast payment systems has seen significant advancements aimed at making financial transactions more efficient, convenient, and secure. In recent times, many countries have implemented or are in the process of implementing real-time payment systems, faster payment networks, instant payment schemes, digital wallets and mobile payment apps, and cross-border fast payment solutions enabling instantaneous fund transfers 24/7, 365 days a year.

Initiatives like the Faster Payments Service in the UK, Faster Payments System (FPS) in Hong Kong, the European SEPA Instant Credit Transfer (SCT Inst) scheme, SWIFT's Global Payments Innovation (GPI), RippleNet, Alipay+, US FedNow, India UPI, central bank digital currencies (CBDCs) and other blockchain-based platform have helped reduce settlement times and costs for local and cross-border payments.

Figure 1: Typical fast payment evolution

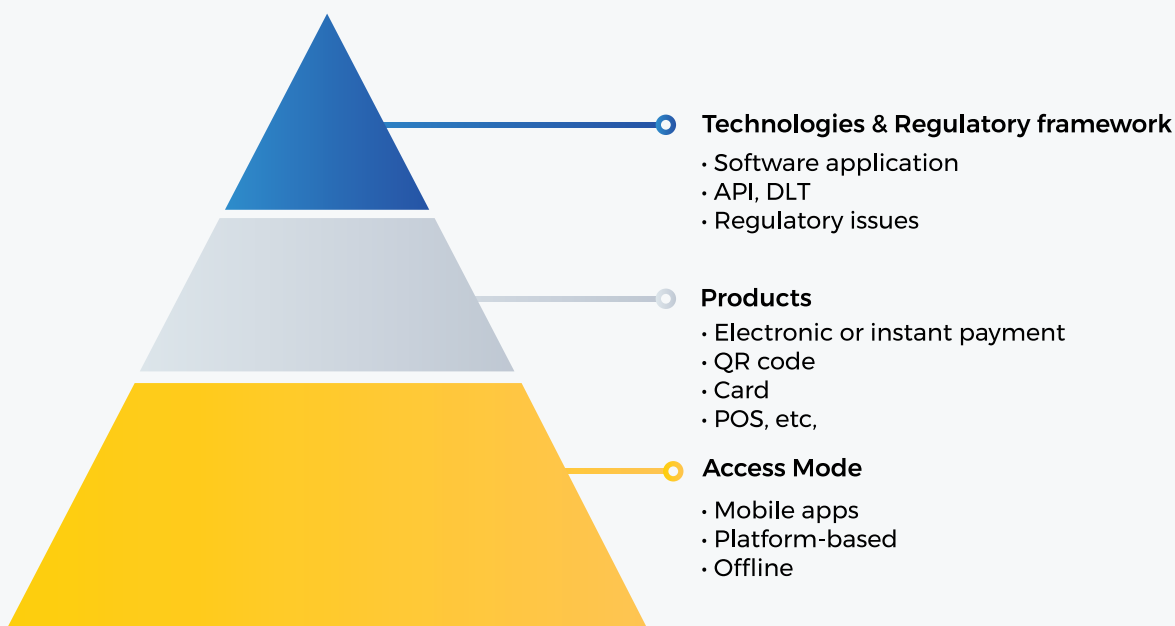


Source: Agpaytech

Today, the domestic fast payment systems have evolved beyond local markets and more countries are seeking integration of various fast payment systems. The future and possibilities of global cross-border payment systems continue to make progress towards cheaper, faster and more secure international payments. Besides the growing competition in the payment industry across regions, giant payment networks such as card networks, digital wallets, mobile network operators and Fintechs are seeking unmatched integration.

Gradually, payments are moving away from traditional instruction methods, which are tied to batch and files, toward application programming interface (API) connectivity. Breaking boundaries and streamlining foreign exchange, the payment ecosystem is shaken up by cutting-edge technological solutions. Several payment players, investors and regulators across the continents are critical to delivering best-in-class digital and cross-border payment experience. The three most important pillars are technology and regulatory requirements, product features and access mode. All the public digital infrastructures are working around these pillars to build a robust financial ecosystem.

Figure 2: Key components of the instant payment



Source: Agpaytech

National UPI-like Payment System

Based on the required technologies, regulations, products, and accessibility modes, many countries and central banks have developed or developed UPI-like real-time retail payment systems. Although the most breakthrough payment innovation in the 21st century is India's Unified Payment Interface (UPI), Brazil's PIX and Singapore's PayNow and US FedNow are likely to achieve higher adoption rates. Table 1 provides an overview of some instant retail payment systems shaping digital payments beyond local boundaries..

Table 1: National UPI-like payment system shaping cross-border paymentstst system

Country	Launch year	What is it?
India, UPI	April 2016	Developed by the NPCI, UPI is a real-time payment system in India that enables instant money transfer between bank accounts via mobile devices. It also facilitates payments by scanning QR codes at merchants. UPI can be used for various purposes such as bill payments, booking tickets, paying for goods and services, and more. Users can request money from others or collect funds owed to them.
Brazil, PIX	November 2020	Brazil's PIX fast payment system allows fund transfers between all types of transaction accounts, creating a payment service ecosystem with low acceptance costs and high levels of usability. Through Pix one can transfer money using the e-mail address or the mobile phone number of the transferee. Like the UPI, Pix also actively uses QR codes as the access channel.
Thailand, PromptPay	January 2017	PromptPay is a fast payment service with real-time clearing and settlement combined with a proxy look-up service that securely maps a national ID number, corporate tax ID, or phone number to a bank account. PromptPay has enrolled 70% of the population, banks charge no fees for using the service, and they have deployed an interoperable QR code system.
Indonesia, BI Fast	December 2021	BI Fast is a fast payment infrastructure that refers to a method of transferring funds or making payments that are characterized by its speed and efficiency for bank and nonbank customers by direct and indirect membership model. It was built by Bank Indonesia to facilitate near-instantaneous transactions, allowing individuals or businesses to send and receive money quickly.
Turkiye FAST	January 2021	Originating from demand from end users and banks, this new infrastructure paves the way for the reduction of cash usage and significant improvements in the payment ecosystem in the country. The FAST system allows 24/7 instant transfer, enhanced speed, and a diversity of use cases and access channels. In addition, a range of overlay services, such as QR codes and aliases (a service called Easy Addressing).
Singapore, PayNow	July 2017	PayNow offers an enhanced funds transfer experience that enables retail customers of the participating banks and NFIs to send and receive Singapore Dollar funds from one bank or e-wallet account to another in Singapore through FAST by using just their mobile number, Singapore NRIC/FIN, or VPA, instantly.

Country	Launch year	What is it?
US US FedNow	July 2023	The FedNow Service is a new instant payment infrastructure developed by the Federal Reserve that allows eligible depository institutions of different sizes across the U.S. to provide instant payment services. Businesses and individuals can send and receive money instantly, and support account-to-account transfer and bill pay.
Mexico CoDi		CoDi is a payment method created by the Central Bank of Mexico (Banco de México) that combined with STP's technology will enable your company to make real-time collections with QRs and push notification messages to your end user's banking applications
Malaysia, DuitNow		Payments Network Malaysia Sdn Bhd (PayNet) is the national payments network and shared central infrastructure for Malaysia's financial markets.

Source: Agpaytech

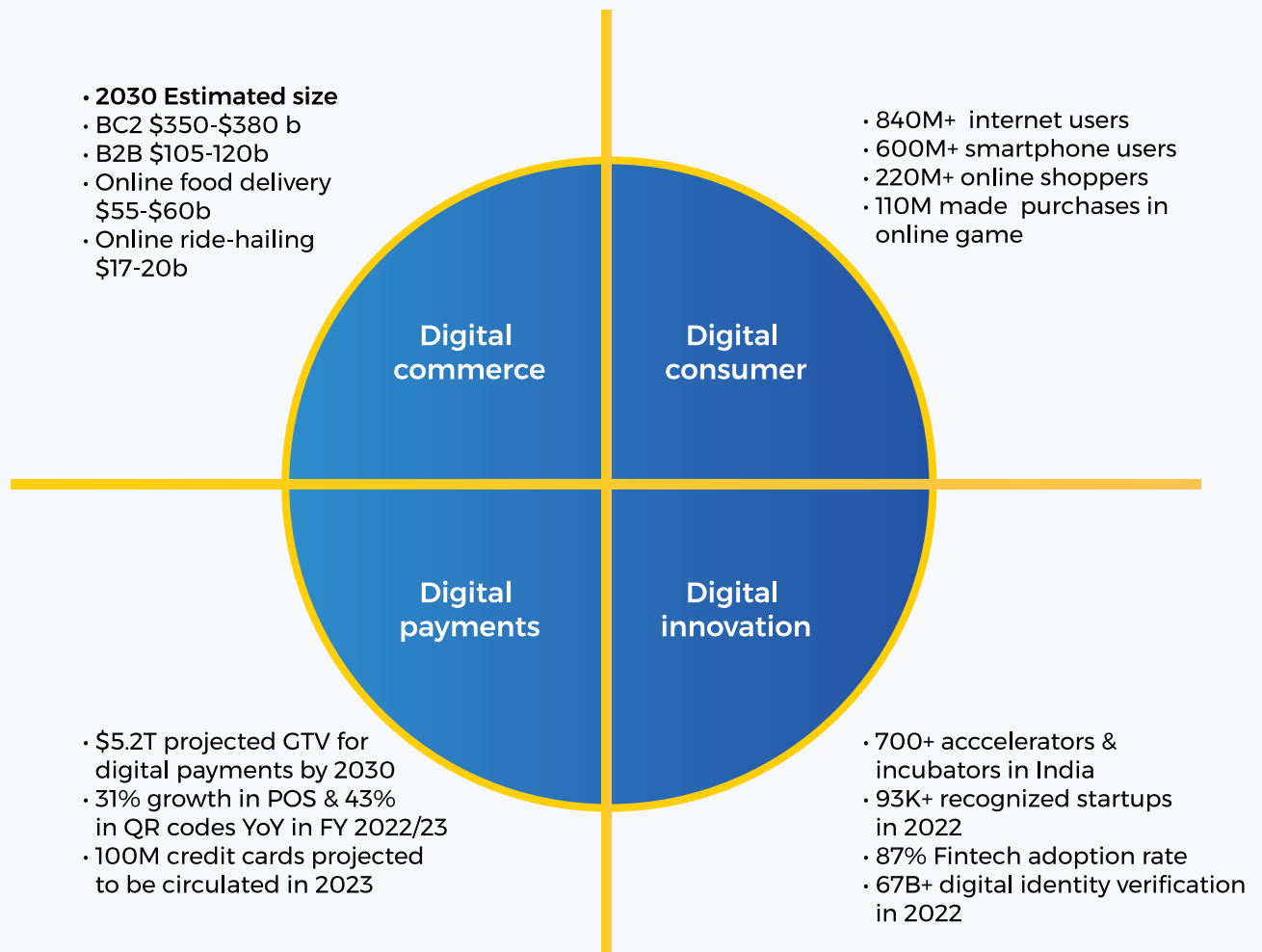
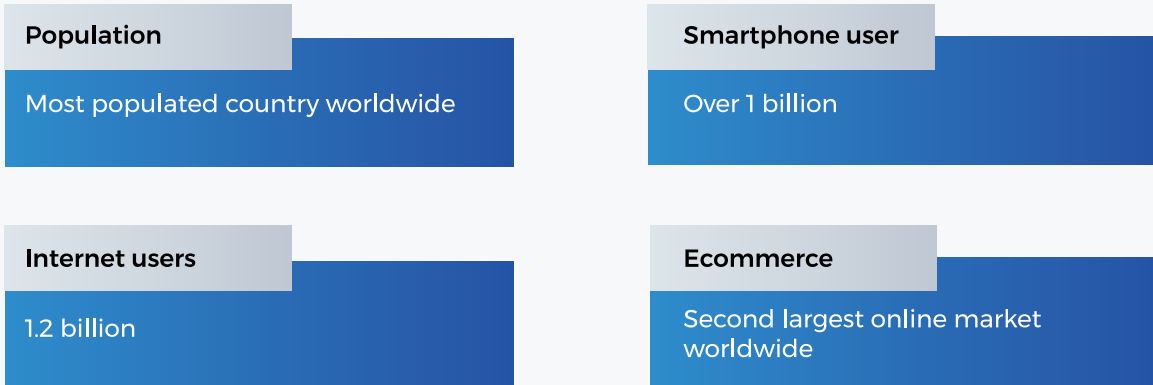
India's Digital Payment Revolution

India has witnessed a remarkable digital payment revolution in recent years, driven by various factors such as government initiatives, technological advancements, increased smartphone penetration, and a growing demand for convenient and secure payment options. Also, the country's large market based on population favours its economic activities. For instance, the United Nations (2023) human population estimates indicated that India is now the most populated country with 1,425,775,850 people, surpassing China in April 2023. Also, the number of smartphone users in India was estimated to reach over one billion in 2023. It was estimated by 2040, the number of smartphone users in India will reach 1.55 billion. Moreover, India had over 1.2 billion internet users across the country in 2023. Currently, India was ranked as the second largest online market worldwide in 2022, second only to China (Statista, 2023).



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Figure 3: Indian digital market statistics system



Source: Visa, Statista, RBI, Web



Source: Paytm

Case of India's Unified Payments Interface (UPI)

The National Payments Corporation of India (NPCI) developed the Unified Payments Interface (UPI) as part of the Reserve Bank of India's (RBI) vision to promote digital payments and foster financial inclusion. UPI is a system that powers multiple bank accounts into a single mobile application (of any participating bank), thus merging several banking features, seamless fund routing & merchant payments into one hood. UPI is a real-time payment system that facilitates inter-bank transactions in India. It also caters to the peer-to-peer collect request which can be scheduled and paid as per requirement and convenience. It was launched by the NPCI in April 2016 to enable easy and instant money transfers between different banks through mobile devices. UPI allows users to link multiple bank accounts to a single mobile application and make payments or transfer funds without disclosing bank account details or net banking passwords. UPI can be accessed on all platforms either on Android or iOS. The App is compatible with Android 4.2.2 and above/iOS 8.1 and above platforms.

UPI Development

The development of UPI has its roots in NPCI. The RBI and Indian Banks' Association (IBA) under the provisions of the Payment and Settlement Systems Act, 2007, initiated the NPCI. The NPCI is an umbrella organization for operating retail payments and settlement systems in India. The UPI in India has its roots in the efforts to modernize and streamline the country's payment systems. Since its launch, UPI has transformed the digital payments landscape in India, witnessing exponential growth in transaction volumes and playing a pivotal role in driving the country towards a less-cash economy. Its success has been attributed to its user-friendly interface, seamless transactions, and support from banks, fintech firms, and the government. The development of UPI began around 2013-2014, and in April 2016, the NPCI officially launched the UPI platform.

Figure 4: Development of UPI system

Formation of NPCI

The NPCI was established in 2008 to create payment and settlement infrastructure

Initial Digital Payment Systems

Combining knowledge of NEFT, RTGS, IMPS and others

Need for Unified Interface

UPI idea emerged to create a more friendly and interoperable payment system

Development and launch

The development of UPI began around 2013-2014, and in April 2016, the NPCI launched the UPI

Continuous improvement

Integrating UPI to banking apps, and third-party payment service providers also

Domestic adoption

Over time, new features like QR code, bills, increased transaction limits etc. were introduced

International adoption

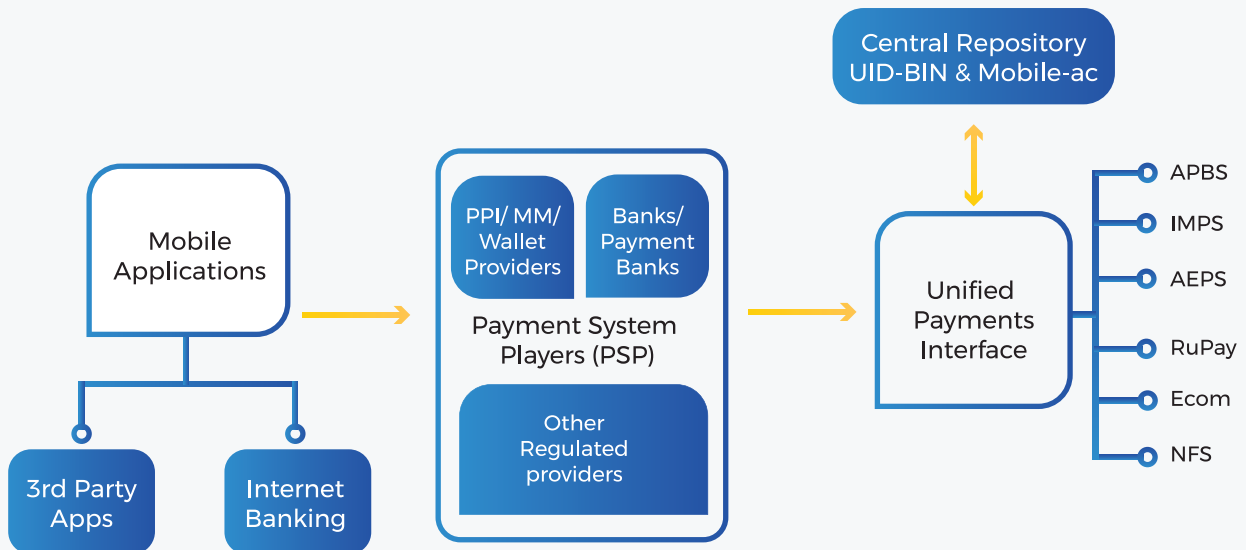
UPI gained immense popularity due to its simplicity, convenience, and interoperability

Source: Agpaytech

UPI Architecture Framework

The UPI is an architecture built with the motivation to become a less-cash society and improve the participation of people in a financial society that has a majority in electronic payments. The UPI is a system developed primarily for mobile phone users, migrating the bank onto the screens of your mobile. Thus it can be said that on average, every person has a mobile phone and every household has one smartphone (NPCI, 2023). If transactions can be made quick and effortless, with the 1-click 2-factor authentication, then more and more people will use such a simple interface. The UPI uses existing payment systems like the Immediate Payment Services (IMPS), Aadhar Enabled Payments Service (AEPS), etc, to ensure the integrity of the transactions. These payment systems are integrated by using a common Interface, which is the UPI. This interface offers instant payment using the mobile phone, which is a value added service.

Figure 5: UPI architectural flow

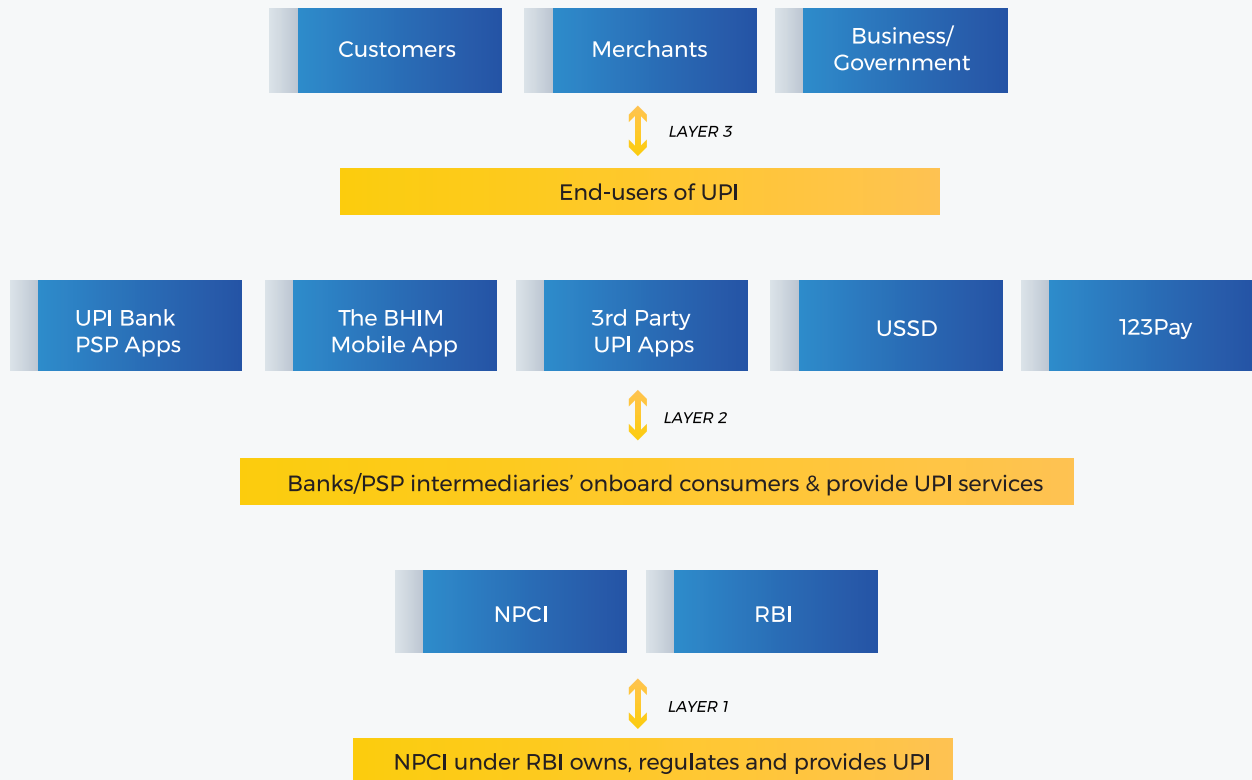


Source: NPCI

Participants in the UPI System

To use UPI, individuals need to download a UPI-enabled app offered by their bank or other third-party apps that support UPI transactions. They can create a unique ID (Virtual Payment Address or VPA) linked to their bank account, and then start sending or receiving money seamlessly through this platform. NPCI is the owner, network operator, service provider, and coordinator of the UPI Network. Banks and payment banks with an RBI-approved mobile banking license and IMPS capability are eligible for UPI. Customers can be on-boarded onto UPI through the platforms BHIM Mobile Application, UPI Bank PSP Apps, Third Party UPI Compliant Apps, *99# (USSD) Each bank's mobile banking apps that support UPI, and 123Pay for feature phone and voice-based payments.

Figure 6: Participants of UPI

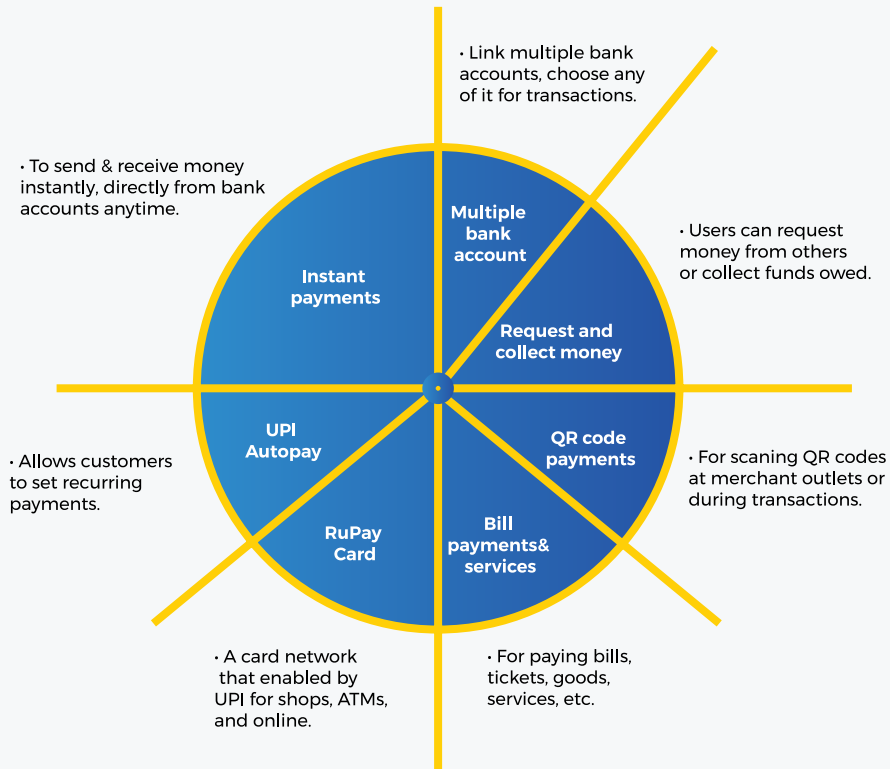


Source: Agpaytech

Key Features and Benefits of UPI

Unified Payments Interface (UPI) is a real-time payment system in India that enables instant money transfer between bank accounts via mobile devices. It also facilitates payments by scanning QR codes at merchant outlets or during transactions, making it convenient for both customers and businesses. UPI can be used for various purposes such as bill payments, booking tickets, paying for goods and services, and more. Users can request money from others or collect funds owed to them by sending a payment request through the UPI platform. UPI transactions are secured through two-factor authentication, often using a PIN or biometric authentication, ensuring a high level of security. These features collectively contribute to UPI's popularity and widespread adoption in India's digital payment landscape, offering convenience, speed, and security in financial transactions.

Figure 7: Key features of UPI



Source: Agpaytech

Figure 8: UPI benefits to the ecosystem participants

Banks

- Single click Two Factor authentication
- Universal Application for transaction
- Leveraging existing infrastructure
- Safer, Secured and Innovative
- Payment basis Single/ Unique Identifier
- Enable seamless merchant transactions

Customers

- Round the clock a-vailability
- Single Application for accessing different bank accounts
- Use of Virtual ID is more secure, no credential sharing
- Single click authentication
- Raise Complaint from Mobile App directly

Merchants

- Seamless fund collection from customers
- No risk of storing customer's virtual address like in Cards
- Tap customers not having credit/debit cards
- Suitable for e-Com & m-Com transaction
- Resolves the COD collection problem
- Single click 2FA facility to the customer

Source: NPCI

UPI Success Factors

Unified Payments Interface (UPI) is a real-time payment system in India that enables instant money transfer between bank accounts via mobile devices. It also facilitates payments by scanning QR codes at merchant outlets or during transactions, making it convenient for both customers and businesses. UPI can be used for various purposes such as bill payments, booking tickets, paying for goods and services, and more. Users can request money from others or collect funds owed to them by sending a payment request through the UPI platform. UPI transactions are secured through two-factor authentication, often using a PIN or biometric authentication, ensuring a high level of security. These features collectively contribute to UPI's popularity and widespread adoption in India's digital payment landscape, offering convenience, speed, and security in financial transactions.

Table 2: UPI success factors

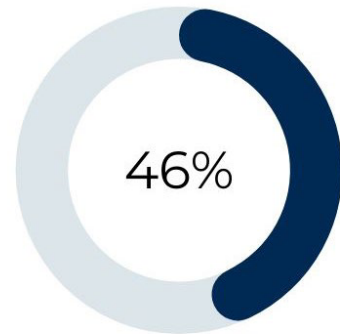
Simplicity and ease of use	UPI offers a simple and user-friendly interface, allowing users to make instant payments directly from their bank accounts using their mobile phones. The seamless and hassle-free process has contributed to its popularity.
Interoperability	UPI is interoperable across various banks and financial institutions. This means users can link multiple bank accounts to a single UPI app, enabling them to access different accounts within a unified platform.
Instant transactions	UPI facilitates real-time fund transfers 24/7, including weekends and holidays. This quick and efficient transaction system has attracted both individuals and businesses.
Government support and initiatives	The Indian government and regulatory bodies have actively promoted UPI as part of their digital payment initiatives, including campaigns such as Digital India. These initiatives have increased awareness and adoption among the population.
Wide acceptance and integration	UPI is widely accepted across various merchants, online platforms, and service providers. Its integration into numerous apps and websites for payments has contributed to its widespread usage.
Security measures	UPI employs robust security measures, including multi-factor authentication, PIN, and encryption, which have helped build trust among users, reassuring them about the safety of their transactions.
Innovation and continuous development	The UPI framework allows for continuous innovation, enabling the addition of new features and services. This adaptability to evolving user needs has helped maintain its relevance and popularity.
Lower transaction costs	UPI transactions typically have minimal or no transaction fees for users, making it an affordable option compared to traditional banking methods or card-based transactions.

Source: Agpaytech

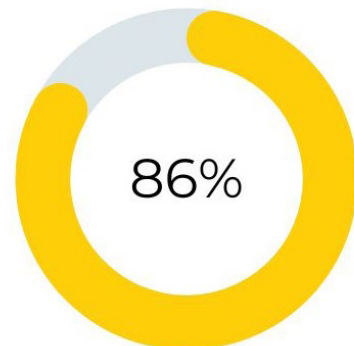


UPI Domestic Adoption & Growth

As of now, the growth of the digital payments network specifically UPI in India is showing no signs of retreat. According to the data sourced from the NPCI, the total value of UPI transactions in November saw a 46% YoY increase in 2023. At the end of the calendar year 2022, UPI's total transaction value stood at INR 125.95 Lakh Cr, up 1.75 times year-on-year (YoY), as per the NPCI. Interestingly, the total UPI transaction value accounted for nearly 86% of India's GDP in FY22. Starting with 21 banks in 2016, the UPI ecosystem has today expanded to 516 live banks as of November 2023, enabling billions of digital transactions each month. UPI's achievement is attributed to a major development in the area of internet penetration, smartphone users, population growth and online marketing.



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UPI transaction value accounted for nearly 86% of India's GDP in FY22. Starting with 21 banks in 2016

Figure 9: UPI monthly product statistics for 2022 and 2023

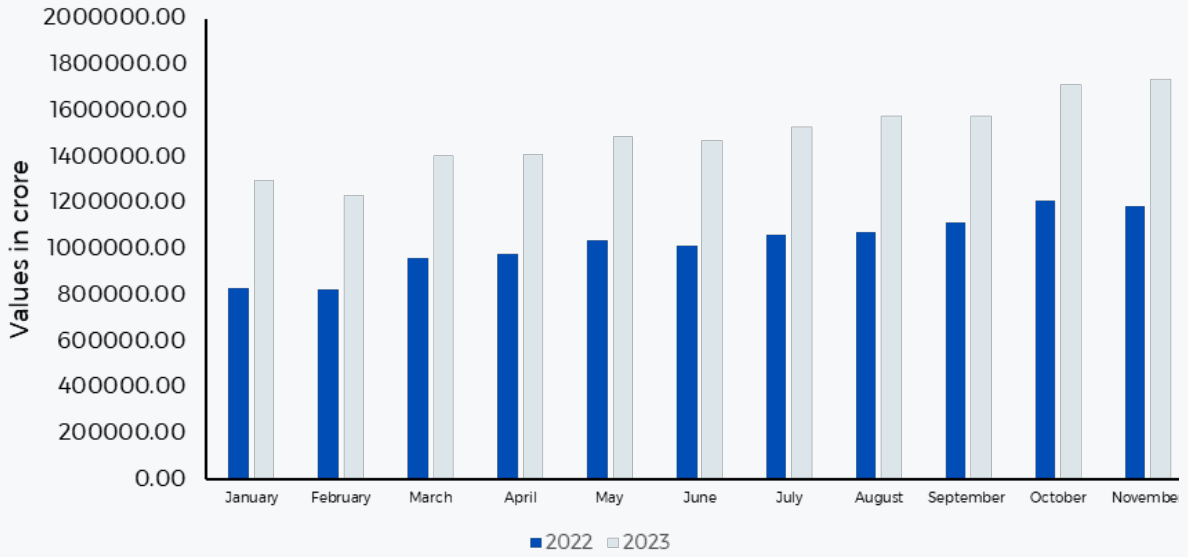


Figure 10: UPI P2P and P2M Transactions

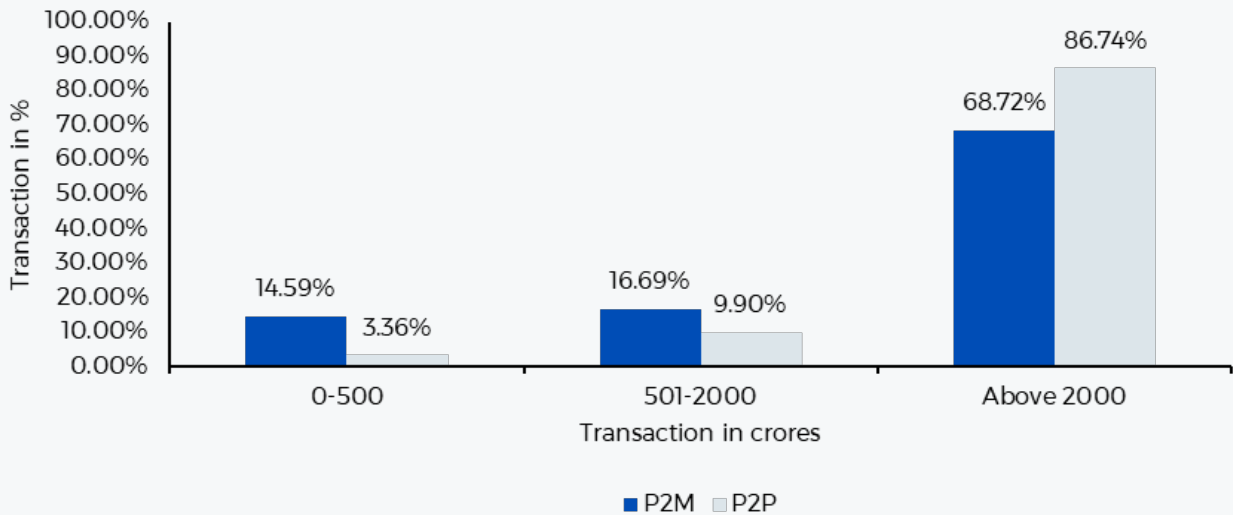
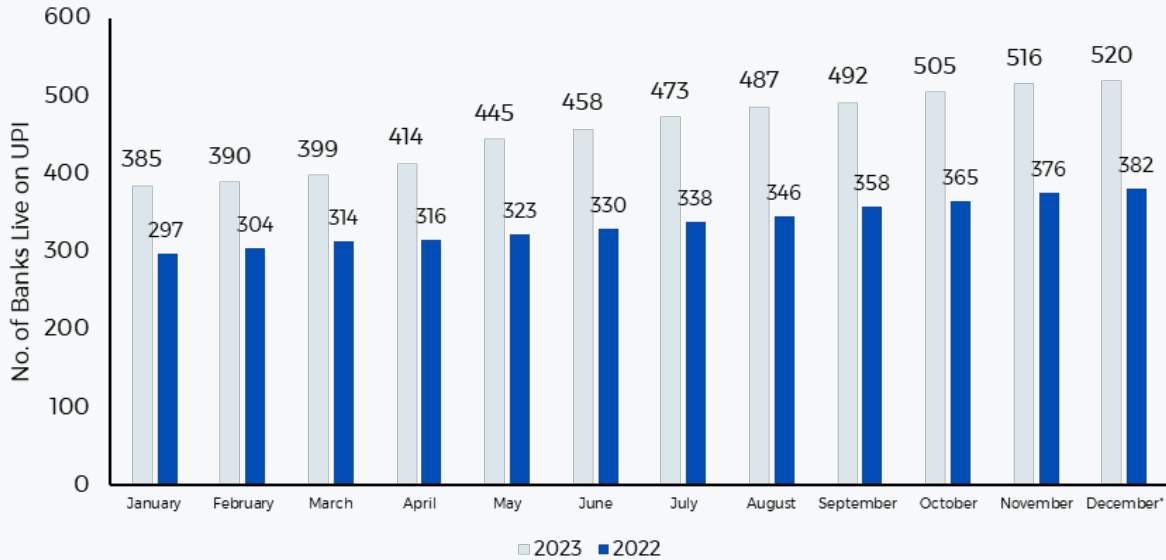


Figure 11: Number of banks live on UPI (as of November 2023)



Source: NPCI, December 2023 is estimated

UPI International Growth & Adoption

Today, UPI has transcended its initial purpose within India, gaining acknowledgment and interest on the global stage. Its recognition by international institutions, collaborations with foreign entities, and potential applications in various countries highlight its significance and success beyond Indian borders. Already, India has shared its UPI technology with many countries including France, Australia, Singapore, UAE, Saudi Arabia, Oman, Nepal, Bhutan, Sri Lanka, and others. Some countries have initiated pilot programs to test UPI-inspired payment systems (e.g. Brazil's Pix). These programs aim to assess the feasibility of implementing similar real-time payment systems in their respective regions.

Map of UPI international connectivity



Already, India has shared its UPI technology with many countries including France, Australia, Singapore, UAE, Saudi Arabia, Oman, Nepal, Bhutan, Sri Lanka, and others. Some countries have initiated pilot programs to test UPI-inspired payment systems (e.g. Brazil's Pix).

Source: Agpaytech

UPI Usage in Foreign Countries

On 10th January 2023, NPCI issued a circular permitting non-residents to transact in UPI. According to NPCI of India, non-resident account types like NRE/NRO accounts having international mobile numbers shall be allowed to get on-board/transact in UPI having satisfied that member banks adhere to FEMA regulations as well as AML and CFT validations. NPCI initially limited the non-resident usage of UPI to Singapore, Australia, Canada, Hong Kong, Oman, Qatar, the USA, Saudi Arabia, the United Arab Emirates, and the United Kingdom. This means non-resident accounts having the listed 10 country international numbers can enjoy instant payment features and remittance or exchange rate services in UPI. It bridges cross-border payment gaps, promotes international trade, and provides seamless payment opportunities to users.

Table 3: Where UPI international accessibilities

Country	Entity	Announced
Bhutan	Royal Monetary Authority of Bhutan	July 2021
Singapore	Monetary Authority of Singapore, PayNow	September 2021
Malaysia	Merchantrade Asia	August 2021
Singapore, Malaysia, Thailand, Philippines, Vietnam, Cambodia, Hong Kong, Taiwan, South Korea, Japan	Liquid Group	September 2021
UAE	Network International (NI)	November 2021
Nepal	Gateway Payment Services, Manam Infotech	February 2022
UAE	LuLu Financial, NEOPAY (Mashreq Bank)	April-August 2022
France	<ul style="list-style-type: none"> ▶ Lyra ▶ India and France agreed to implement this following PM Modi's visit to France 	June 2022 July 2023

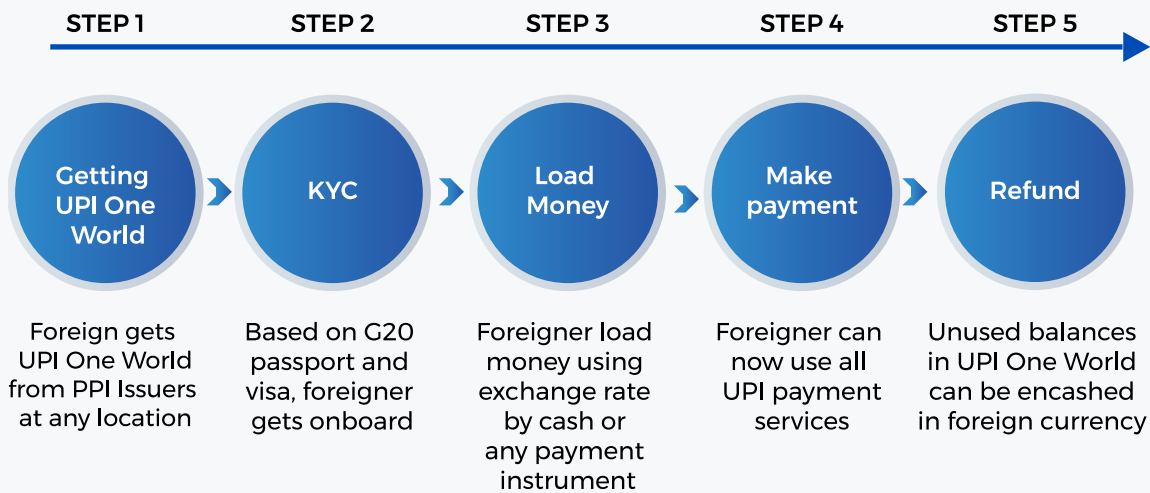
Country	Entity	Announced
United Kingdom	Terrapay, PayXpert	August-September 2022
Netherlands, Belgium, Luxemburg, Switzerland	Worldline	October 2022
Oman	Central Bank of Oman	October 2022
UAE	UAE Central Bank's Instant Payment Platform (IPP)	July 2023
Sri Lanka	Network-to-network agreement for UPI [announced during President Ranil Wickremesinghe's two-day visit to India]	July 2023

Source: Web Compilation

UPI One World for G20 Countries

UPI One World is a slice of the UPI experience crafted for inbound travelers. It is the Prepaid payment instrument linked to UPI provided to foreign nationals/ NRIs coming from G20 countries. The PPI on the UPI wallet can be used for merchant transactions across the country. UPI One World eliminates the hassle of carrying cash and handling multiple foreign exchange transactions, provides easy, safe, and instant digital payments and tracks spending in the transaction history of the PPI-UPI Application.

Figure 12: Process for Foreigners to use UPI One World



Source: Agpaytech

UPI International Payment on Connectivity

- ▶ Indian users can now make international UPI payments by scanning a QR code at selected businesses abroad in selected countries. First, consumers need to activate international payments on UPI apps that support international payments, such as PhonePe, Google Pay, and the Bhim UPI app.
- ▶ PayNow – UPI linkage provides a convenient (24/7), fast (near real-time), secure, and cost-effective means for customers of participating Banks and Non-Bank Financial Institutions (NFIs) in Singapore and India to perform cross-border transfers. In essence, Singapore’s PayNow and UPI users will be able to send money instantly and securely across the two countries.
- ▶ On 7 February 2023, PhonePe announced extending support of UPI for international payments in UAE, Singapore, Mauritius, Nepal, and Bhutan. Users will be able to pay in international currency directly from Indian bank accounts.
- ▶ Additionally, India has forged closer financial ties with Singapore, facilitating smoother remittance flows between the two nations by linking their payment systems.
- ▶ NIPL has entered into a partnership with European payment services facilitator Worldline, to expand acceptance of Indian payment channels across Europe. Under the partnership, Worldline’s QR code-based mechanism will allow merchants’ Point-of-Sale (PoS) systems in Europe to accept UPI payments from Indians using their mobile phones.
- ▶ TerraPay, a leading global payments infrastructure group announced its partnership with NIPL on September 22, 2022. This partnership intends to enable Indian customers and merchants in India with an active UPI ID to make and accept cross-border payments seamlessly by leveraging TerraPay’s agile infrastructure and the UPI network.



UPI International Payment on Connectivity

Japan making an effort to join India’s UPI system. In a joint press release, Japan is now gearing up an effort to join India’s UPI. Japan Digital Minister Kono Taro also asserted that it is contemplating how it can mutually recognize eID to improve interoperability. Japan joining UPI is expected to boost its remittance and cross-border payments. Remittances from Japan account for only 0.2% of the total inward remittance receipts in India.



Remittances from Japan account for only 0.2% of the total inward remittance receipts in India.



UPI Technology to Africa: Possibilities & Roadmap

UPI system has gone international and many Asia (Singapore, etc.) and European countries (France, etc.) are piloting or implementing its cross-border usage. However, no country or payment service provider in Africa has officially announced to be connecting to India's UPI. Several digital news outlets hinted about an ongoing discussion with Namibia, Mozambique, and Kenya to enter into commercial partnerships for launching UPI in the markets. Yet, none of the mentioned countries has confirmed or made press releases to that effect. Most importantly, UPI expansion to Africa is feasible and would be in the best interest of addressing cross-border e-commerce and trade payment challenges among partnering countries. Also, such an initiative is poised to drive financial inclusion, support rural economies, foster FinTech innovation, and promote transparency among other things.

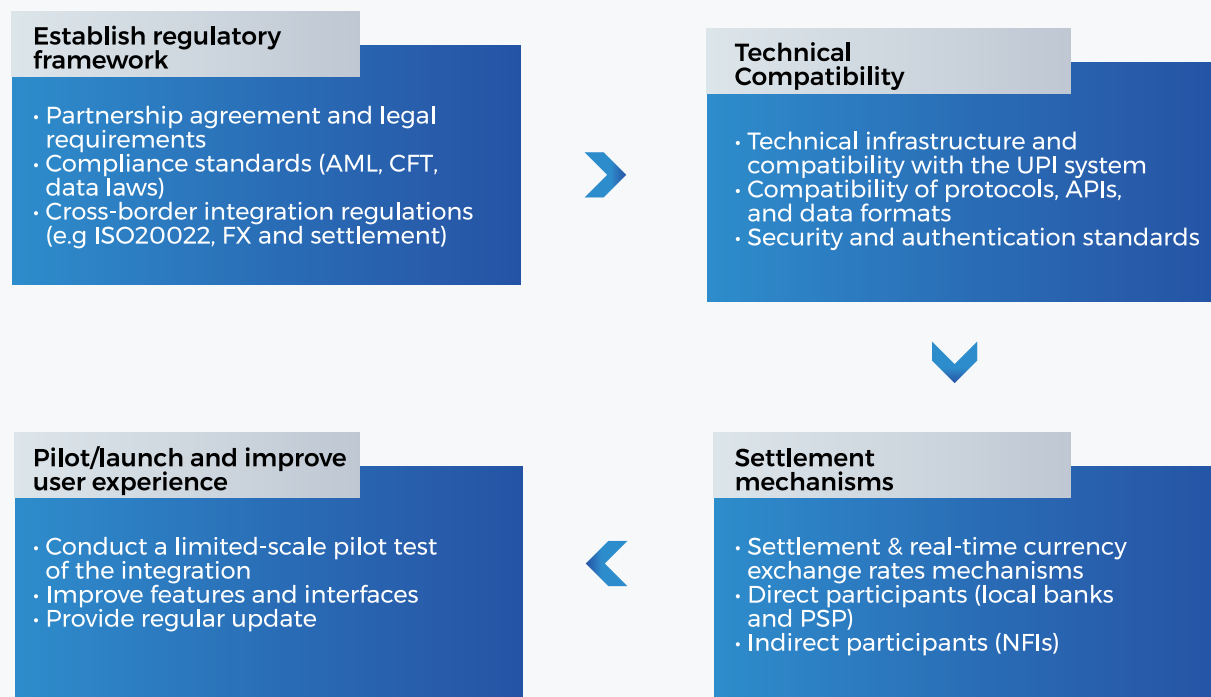
Many central banks in Africa have set up subsidiaries of innovative centers like India's NPCI to develop a robust instant retail payment system like the Central Bank of Ghana's GhIPSS and the Central Bank of Nigeria's NIBSS. Overseeing robust technological and efficient payment systems, these institutions are encouraged to lead cross-border payment integrations (UPI, Pix, PromptPay, Alipay+, etc.) capable of universal interoperability by all participating banks, Fintechs, MNOs, and NFIs.

Connecting a payment system in Africa to India's UPI system involves multiple technical, regulatory, and operational considerations. This framework provides a structured approach towards connecting an African payment system with India's UPI system, emphasizing the need for collaboration, compliance, technical integration, and user-centric design for a successful cross-border payment solution.



Most importantly, UPI expansion to Africa is feasible and would be in the best interest of addressing cross-border e-commerce and trade payment challenges among partnering countries.

Figure 13: Roadmap for UPI-Africa connectivity

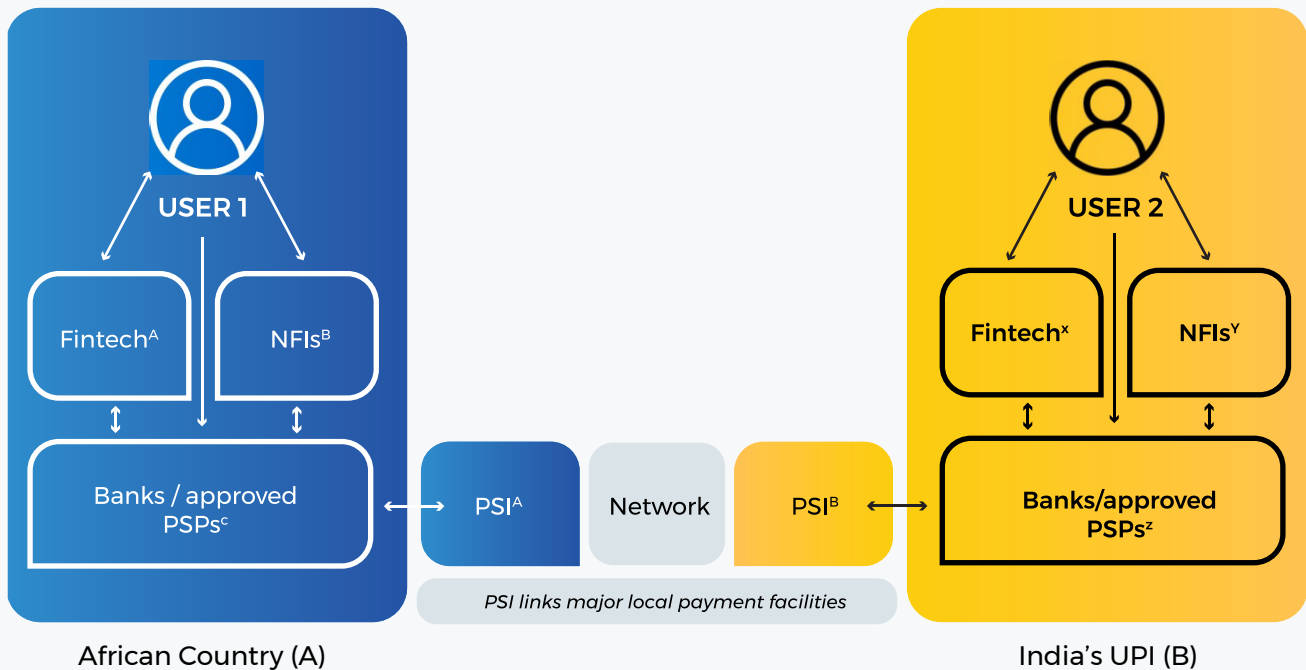


Source: Agpaytech

Architectural Framework for UPI Interlinking

Cross-border transactions can be made possible by establishing bilateral links between national payment system infrastructure (PSI) capable of linking India's UPI and payment system in African countries, maybe in Ghana, Kenya, or Nigeria. The interlinking mechanism is usually a standardized messaging and connectivity technology, which links account management and the various national operating systems together, while participants access the hub entity through the national settlement infrastructure of their jurisdiction (ITU, 2016). Perhaps the simplest form of PSI interlinking is achieved when two national payment switches e.g. (GhiPSS, NIBSS, SARB's PayShap, PAPSS, etc.) agree on a scheme to support or facilitate cross-border transactions. This likely requires linking the UPI and the African-based PSI systems of the countries involved by developing technical interfaces between them. The direct linking of UPI and African country PSI without correspondent or settlement banks improve speed and reduce the cost of transaction as well as promote bilateral trade activities.

Figure 14: Interlinking national payment system infrastructure



Source: Agpaytech

NOTE

- User 1 Can initiate transactions using PSP (A, B, C) mobile application or internet platform
- A, B, C A, B, C PSP system authenticates the transaction using registered IDs (mobile number, PIN) and sends a payment request to PSIA
- PSI^A National PSIA (e.g. NIBSS, GhIPSS) receives the payee's address, determines the FX rate, approves fees and sends a request back to Banks/approved PSPC to debit the money.
- PSI^A & PSI^B After PSIA receives confirmation of debit, PSIA sends a request to PSIB in India to credit the debited amount to the User2 account with PSP xyz in rupee
- PSI^B → PSI^A A, B, C PSP system authenticates the transaction using registered IDs (mobile number, PIN) and sends a payment request to PSIA



Benefits of Linking India's UPI to African Country Payment System

With growing national payment initiatives across African countries such as South Africa's PayShap, Ghana's GhIPSS GhanaPay and NIBSS Instant Payment (NIP) and high adoption rates of banks, PSPs, NFIs, etc, interlinking payment systems between India's UPI and an African country's payment system can facilitate smoother and faster cross-border transactions. This can significantly boost bilateral trade by simplifying payment processes and reducing transactional barriers.

Also, the Indian diaspora in the African region is growing (South Africa 1560000, Mauritius 894500, Kenya 80000, Bostwana 12000, Uganda, 30000, etc.). Linking payment systems will help the Indian diasporas, as well as the African diaspora to accept business reunions across the region.

Collaboration between India and an African nation in the payments sector can lead to knowledge-sharing and technology exchange. This can foster innovation and the development of better payment solutions for both regions. Integrating with India's UPI can aid in the development and modernization of the financial sector in the African country. It can lead to the adoption of more sophisticated financial technologies and practices. It is important to consider regulatory and security aspects when linking payment systems between countries. Collaborations should prioritize security measures, data protection, and regulatory compliance to ensure the safety and privacy of transactions for users in both regions.



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Conclusion

Enabling interoperability between payment systems requires more than just technical compatibility. As with the development of any new payment system, the first step in enabling interoperability is understanding the use cases and goals that interoperability seeks to achieve. These determine whether interoperability is the appropriate option. Also, successful interoperability will likely involve educational efforts for system participants and end users to boost the usage of these interoperable links.

It is also time for countries in Africa to seek to unify all payment systems to reduce the many dislinked payment infrastructures. Providing a one-all unified payment infrastructure interface would help eliminate the payment complexities, improve efficiencies and transaction monitoring as well and help interoperability with other countries such as PayNow, PromptPay, Pix, UPI, etc. The interlinking of national payments across Asia, America, and the European region will boost global trade, cheaper and increased remittance flows and economic trade activities.

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Agpaytech Ltd. is a company pioneering in the Fintech space with a focused approach to building robust technologies for e-commerce Card Processing Solutions for Payment Service Providers (PSPs). Additionally, we provide Compliance and Regulatory Umbrella, Remittance-as-a-Service (RaaS), Banking-as-a-Service (BaaS), Foreign Exchange, Cross Border Payments, and digital currency technology.

We also provide practical white paper research support to central banks, government and private institutions, economic organizations, and NGOs in Africa. Our services expand from research projects, state-of-industry reports, project assessment, data collection, and consulting services in the fintech space.

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