06 India

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Summary Frame

Country summary: **India**

Country group	**LMIC**
% adults with a financial account (Findex, 2017)	**80%**

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STATUS

ACCOUNT TO ACCOUNT R/T:

Name of scheme/s	**Unified Payments Interface (UPI)**	**Immediate Payment System**
Date of launch	**Pilot launch- April 2016** **UPI enabled apps launched in August 2016**	**Pilot launch- August 2010** **Public Launch: November 2010**
Scheme manager	**NPCI - public sector banks (with majority share) and private banks**	**NPCI - public banks (with majority share) and private banks**
Membership	**Voluntary-** **Direct participants: licensed banks and Prepaid Payment Issuers (PPIs)*** **Indirect participants: Third Party App Providers (TPAPs)**	**Voluntary - Licensed banks and Prepaid Payment Issuers (PPIs)**
% financial accounts included in scheme	**207 banks**	**592 banks and 26 PPIs**

HIGHLIGHTS

Highlights from country:

- An industry-led approach to ownership and governance, with strong regulator backing: NPCI benefited from having a balance between industry ownership of the scheme and sufficient regulator and government accountability to progress.
- Whereas regulatory mandates have had mixed success (e.g MDR caps by Ministry of Finance which continue to suppress merchant acquiring and the mandate by Telecoms Regulatory Authority of India (TRAI)for telcos to offer USSD as a "dumb pipe" for banks which ultimately failed to create a viable model at scale.), support for industry led solutions has been more successful e.g bring banks to the table in forming NPCI, promoting BHIM to drive uptake on UPI.

INTEROPERABILITY JOURNEY:

- Under the RBI, India's retail payment system was lagging behind economic progress that steam-rolled in the 1990s.
- RBI's role in the financial system became an open internal debate, which led to a search into global best practices.
- The outcome was that very few central banks operate retail payment systems, and this led to the 2007 payments Act that birthed NPCI as a new entity for managing retail payments.
- NPCI was launched in 2010, and within 5 years catapulted innovation in India's payment system.
- In 2013, the need for making the different retail digital payments offerings interoperable arose. At the same time the governor who was exposed to other markets was pushing for faster payment similar from his experience in the UK.
- India experimented with a single USSD channel for India to promote interoperability across mobile initiated payments, but that failed to take off.
- As the world was quickly moving away from feature phones, NPCI focussed on an app solution - UPI was thus formed.

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Setup and Ownership

Summary frame: **A2A Interoperability objectives**

- **‘Less-Cash’ India**: Reserve Bank of India’s (RBI) Vision document 2018 (published Jun 23, 2016) laid significant focus on **encouraging greater use of electronic payments** for a “less-cash” India by ‘building a robust payments infrastructure in the country to increase the accessibility, availability, interoperability and security of the payment systems’ t**hrough technological solutions** that are customer centric, fast and convenient to use.
- **Interoperability**: Under this strategic objective, RBI noted ‘Promoting Interoperability’ as a key focus area that recognised UPI’s high-potential for driving electronic payments by providing a standard interface for communication across different mobile-banking applications of banks thus facilitating interoperability in P2B payments and promoting customer convenience.

UPI — UNIFIED PAYMENTS INTERFACE

- To **promote adoption and usage of digital payments** in the country as digital payments were not taking off despite the availability of fully interoperable instant payment mechanisms like IMPS
- To create an **easy to use, mobile-based, instant** payment system that is available 24x7
- To ensure **full interoperability** across a substantive base of formal financial service account holders.
- To ensure that transactions can be conducted **securely** and without requiring access to vulnerable account or bank details of the receiver (through **virtual identifiers**)

IMPS — IMMEDIATE PAYMENT SERVICE

- To enable bank customers to access their accounts and **remit** funds **instantly, 24X7** using a **mobile device**.
- To make payments simpler by allowing customers to transact using a **mobile number +MMID** of a registered recipient
- To sub-serve the goal of Reserve Bank of India (RBI) in **electronification of retail payments**
- To **promote interoperability** in mobile payment systems across banks and mobile operators in a safe and secured manner
- To build the **foundation for** a full range of **mobile based banking services**.

A2A interoperability: **UPI**

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BACKGROUND: The confluence of the market, regulator and innovators led to the development of UPI

Formation of National Payments Corporation of India (NPCI)

RBI driven solution:

- To ensure that India's payment systems kept up with global standards, RBI tasked the Indian Bankers Association with forming an entity to take over its role of managing retail payments. This ensued from an RBI investigation of global best practices governing a regulator's role in the payment system.
- Beyond convening to create NPCI, RBI also supported the economic sustainability of the organisation by transferring the the task of operating the Cheque Truncation System (CTS) and the National Financial Switch to it, which constituted the main initial revenue sources for NPCI.

Formation of United Payments Interface (UPI)

Market driven solution:

- In 2013, three years after NPCI realised a need to make its growing list of products fit together better in facilitating the different types of payment use cases.
- It had recently launched IMPS an interbank payments product which had limited uptake linked to its poor self-service/ mobile usage journey because it required Mobile Money Identifier (MMID) for transactions.
- In search of solutions, the NPCI team travelled to developed markets such as the UK and Australia to understand global best practices but decided to develop a solution that addressed local challenges while facilitating a push towards digital payment usage, increasing adoption and enhancing user experience.

Supportive regulatory environment:

- At the same time that NPCI started looking for solutions (2013), Raghuram Rajan, a champion for faster payments solutions, became the RBI governor.
- In 2016, RBI's Vision 2018 document **laid the foundation** for a robust payments solution that was interoperable, easy to access and secure by adopting technological solutions that are customer centric, fast and convenient to use. Following RBI's vision, NPCI led the development of UPI and continues to manage and operate the scheme through governing committees appointed within NPCI.

Fintech collaboration: In 2016, NPCI worked with iSPIRT, an open source volunteer developer community, to define and develop the Unified Payments Interface (UPI). In July 2015, NPCI contracted RS Software to build the initial version of the UPI platform which was later adopted and refined by industry bodies. UPI which was first piloted on 11th April 2016 with 21 member banks.

Source: Cook and Raman, 2019

A2A interoperability: **UPI**

ROLE OF REGULATOR: Continued engagement by the regulator as well as executive "activism" by the policy maker to maximize market welfare

- RBI continues to lead, support, and facilitate the interoperability dialogue between market participants such as publishing ***guidelines paving the way for Prepaid Issuers (PPIs) to connect directly to UPI rails*** which was previously limited to banks.

- Recent developments towards furthering innovation include **RBI's decision to invite applications to develop New Umbrella entities (NUEs)** for fostering innovation and creating solutions that would include populations that are are not being served by the current design of UPI. The objective behind this is to minimize the concentration risk in retail payment systems, introduce competition in the payments sector and to encourage innovation and promote developmental objectives.

- RBI has also set up a framework for a Regulatory Sandbox (RS) and the Reserve Bank Innovation Hub (RBIH) to spur innovation and help in offering payment solutions for the underserved.

- It is also important to distinguish between policymakers and regulators in terms of how the government influences the payment space. While RBI retains its position as a regulator catalyzing participation on UPI, the government may intervene to develop policies and incentivise usage based on their identified objectives (such as suspending MDR on UPI (see more details under business model).

Source: BFA interviews (2020 -2021)

A2A interoperability: **UPI**

BUSINESS MODEL: Lack of an appropriately incentivising business model for Financial Service Providers (FSPs); although regulators and the government are experimenting with subsidies or reimbursements, FSPs are still searching for an economically viable business model

The rules for UPI pricing have been changing since its launch in 2016.

- While P2P and merchant transactions were initially minimally charged, as of 1 January 2020, the Ministry of Finance prohibited any customer fees or merchant discount rate over UPI, directly impacting the revenue model of the participating banks and TPAPs.
- Last year some **banks started charging** for transactions carried out through UPI but were directed by the Ministry of Finance to immediately refund any such charges collected for facilitating UPI transactions after 1st January, 2020.

Market share cap: To address possible risks induced by growing transaction volumes on UPI, NPCI has decided to impose a cap on the share of UPI transactions that a single payment application can process. According to the circular, starting January 2021, third party applications providing payments services via UPI can process a maximum of 30% of the overall volume of transactions processed in UPI during the preceding three months (on a rolling basis). The participating TPAPs have expressed some discontentment with this move as this is expected to limit digital payment growth thereby impacting the business case of the Third Party Application Providers (TPAPs).

In order to promote the adoption of digital payments

- The Central government has in the past experimented with reimbursement of MDR charges to financial institutions for transactions upto Rs. 2000 made through debit cards, UPI and AePS till December 2019, but has currently discontinued the practice.
- In the recently announced budget for FY 21-22, the government has earmarked Rs. 1500 crores ($200 million) to incentivise digital modes of payment in the country. While it is still unclear as to how these fund will be used, it is expected to bring some respite to the participating payment service providers on UPI.

There are players rising to the challenge of innovating business models where the customer is not charged.

  - Particularly on the merchant payments side, players like BharatPe are convinced payments will remain free and the business model will be built around delivering products such as credit to merchants accepting digital payments. They have already managed to build a substantial credit portfolio.

Source: BFA interviews (2020 -2021)

A2A interoperability: **UPI**

GOVERNANCE

- **By design of the Payments Act 2007, NPCI is majority owned by public-sector banks.** NPCI begun operations in Jan 2010. The RBI tasked the India Bankers Association with forming the new organisation on a voluntary membership basis.

- NPCI started with 10 core promoter banks as shareholders (six public-sector banks. two private domestic banks and two foreign banks) to represent a cross-cutting base of Indian consumers. All the banks contributed about USD14M in total to hold a 10% share in NPCI.

- However, the shareholding was **later expanded to include banks representing the full spectrum of customer segments.** As of 2020, 67 banks are shareholders of NPCI, comprising of 11 public sector banks, 18 private sector banks, 5 foreign banks, 10 Cooperative banks, 7 Regional Rural Banks (RRBs), 4 Small Finance Banks (SFBs), 2 Payment Banks (PBs) and 10 PSOs.

- NPCI's board currently comprises of 15 members including the Non Executive Chairman of NPCI, the MD & CEO of NPCI, 6 representatives from core promoter banks, 2 representatives from shareholder banks, 4 independent directors and one RBI nominee director.

- While individual products or schemes such as UPI are managed and run by governing committees appointed within NPCI, RBI continues to lead, support, and facilitate the interoperability dialogue between market participants such publishing guidelines paving the way for Prepaid Issuers (PPIs) to connect directly to UPI rails.

Source: BFA interviews (2020 -2021)

A2A interoperability: **UPI**

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OUTCOME: The infrastructure allows for full interoperability backed by a substantive base of formal financial service account holders, but the lack of a fair pricing model that appropriately incentivises the participating Financial Service Providers (FSPs) and the limited uptake of its USSD product offering remains as challenges

- UPI has followed a bank-led approach (ensuring full interoperability amongst banks) and is slowly including nonbanks over time to widen the scope, access and outreach of payment systems.
- While payment choices have significantly improved through interoperability offered by UPI, it **remains limited to people enrolled with a formal account, owning a smartphone, and with a modicum of digital familiarity**, which may not be sufficient to improve financial inclusion outcomes.
    - While UPI was made available on basic phones for non-smartphone users through the *99# USSD channel, its uptake remains limited due to a variety of challenges that result in frequent transaction failures. NPCI highlights known issues such as compatibility concerns with a few handsets; frequent timeout errors or declined requests due to network/connectivity issues; and a non-intuitive interface leading to wrong user inputs. In addition to this, a fund transfer upper limit of Rs. 5000 (USD 68) and per transaction charges by the TSPs may further compromise user experience and adoption. The TRAI (Telecom Regulatory Authority of India) has set a maximum ceiling of Rs. 0.50 / transaction for using the *99# service.
    - In order for UPI's adoption to increase and extend itself to excluded non-banked, non-smartphone users, there appears a need to innovate further to extend its adoption to users low on literacy, numeracy and digital familiarity along with providing payment options to non-account holders.
- The interviews also highlighted that regulation must **aim to appropriately incentivise participants/providers** to improve customer outcomes and commit investments to support smooth functioning at scale.

Source: BFA interviews (2020 -2021)

A2A interoperability: **UPI**

- **Dispute Redressal Mechanism**: Currently, customers can raise UPI related complaints on their TPAP or PSP provided UPI app. The complaint is first raised with the customer's TPAP followed by the PSP Bank. Unresolved complaints are redirected first to the customer's bank and finally to NPCI. If the grievance still remains unresolved, the end-user can approach the Banking Ombudsman and / or the Ombudsman.
  It is easy for customer grievances to get lost the array of partners in play. It is suggested that NPCI hosts a consumer grievances portal which could consolidate consumer voices and make it harder for banks to ignore such grievances. It may also allow the regulator to understand individual consumer concerns behind the aggregate statistics and make policy interventions as and when needed.

PERFORMANCE

of its launch, with the volume increasing from 1.3 billion transactions in Jan 2020 to **2.3 billion transactions** in Jan 2021. While UPI's adoption was mostly urban-centric in the first few years of its launch, 2020 saw a significant jump in UPI's usage and adoption in tier II and tier III cities. As of February 2021, Phone Pe emerged as the largest player on UPI the witnessed over 975.53 million UPI transactions attributing its growth in UPI space is to the large adoption in Tier 2 and Tier 3 cities.
UPI's user-friendly transaction interface, simple financial addresses and linking of multiple bank accounts is believed to have fueled the adoption of UPI, however, there is still a gap in terms of digital payment solutions for low income customers who are often also low on literacy, numeracy and digital familiarity.

A2A interoperability: **IMPS (Immediate Payment Service)**

OUTCOMES: A real-time 24*7 instant payments system that can be accessed using electronic channels; attributed to be a bigger driver of financial inclusion than UPI by providing instant payment options to unbanked, excluded populations through Business Correspondents (BCs) and non-bank Prepaid Payment Instruments (PPI) agents, while the user interface is limited to a frontend designed and owned by each bank

- Introduced in 2010 as a system providing real time transfer of funds between the remitter and beneficiary with a deferred net settlement between banks.
- As of Feb 2021, **592 banks and 26 PPIs are active members of IMPS** compared to 207 banks on UPI.
- Initially, the system required both the remitter and the beneficiary to be registered for mobile banking which was inhibiting growth and adoption. Eventually, the system was upgraded to enable remittance of funds by using other parameters such as account number and a bank branch identifier (Payment and Settlement Systems, 2020).
- For the prepaid industry, the first flavour of interoperability is attributed to IMPS. IMPS **allowed non-bank FinTech firms such as PPI issuers to participate in the scheme**, giving way to creation of use cases that facilitated instant remittances from wallets to the recipient bank accounts. Unbanked users such as migrant workers who earned in cash could approach a PPI agent/merchant with cash which was digitised and was then remitted to any bank account across the country.
- IMPS transaction fees are chargeable to the customer and the rates are decided by the individual banks providing the service. RBI recommends that the pricing structures remain 'transparent and affordable' making the business model financially viable for the participating banks.
- However, the interface for conducting IMPS transactions electronically **requires a user to go through their bank's internet banking website or mobile app limiting their experience** by a frontend designed by their bank which hindered digital payments adoption and usage in the country, ultimately giving rise to the development of UPI.

Source: BFA interviews (2020 -2021)

A2A interoperability: **Competition & Innovation for UPI (1/2)**

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The current setup appears not to optimize competition and innovation, however the regulator is intervening to balance market outcomes

Current competition issues:

For participating FSPs

- **Zero merchant discount rate (MDR) and no customer charge** aimed to increase the uptake of digital payments instead makes the business model financially unviable for participating banks, payment gateways and TPAPs. This may bring about reduced contestability in the space, wiping smaller players out and leaving only the ones who have capital to spare to compete for market shares. To address this issue, RBI has floated the payment infrastructure development fund (PIDF) worth ₹ 345 crore ($46Mn) intended to subsidise banks and non banks deploying payment acceptance infrastructure in Tier-3 to Tier-6 centres.

For TPAPs

- In Nov 2020, **NPCI introduced a market cap on UPI** such that that third party applications providing payments services via UPI **can process a maximum of 30% of the total transaction volumes** starting Jan. 1, 2021.
  - The biggest share of the volumes on UPI is driven by TPAPs (with PhonePe and Google Pay accounting for a little more than 82 percent of the overall transaction volume in 2020, while together with PayTM and Amazon Pay these four providers claimed close to 98 percent of the total volumes transacted on UPI (Tech Crunch, 2020) raising concerns of concentration risk, systemic failures and monopoly or duopoly in the space.
  - However, this cap not only disrupts the business model of TPAPs but will also hamper innovation in the space, limit consumer choice and possibly hinder adoption over time.
  - Increased market concentration and network effects may over time limit the market to only a few players.
  - It is also important to note that **the 30% cap is only for TPAPs** and not UPI-based apps operated by banks. The guidelines do not clarify why the two entities are treated differently.

A2A interoperability: **Competition & Innovation for UPI(2/2)**

Encouraging developments and recent interventions:

For Participating FSPs

- While all participating banks are allowed to create their own UPI apps, NPCI introduced the BHIM as a **"reference" app** with the support of the iSPIRT (an open source developer community) allowing smaller banks with limited resources to allow their customers to **access the UPI facility without having to develop their own app** thereby streamlining customer experience. However, the need for NPCI to institute multistakeholder standard-setting processes for the UPI have also been raised.

For Non-bank entities:

- While non-banks were not originally allowed to become direct participants in UPI, the regulator intervened and **allowed KYC-compliant PPIs to act as Payment Service Providers (PSPs) on UPI**. The regulator recognises that bringing banks and non-banks together is essential for inclusive growth and development. Non-banks such as PPI and NBFC-MFIs cater to unbanked populations that remain underserved, are low on digital and formal literacy and it is essential for these entities to be able to offer innovative payment solutions to their customers.

For the scheme operator

- Beyond setting up NPCI as an umbrella organisation for operating retail payments and settlement system in India, RBI continues to lead, support, and facilitate the interoperability dialogue between market participants to keep suboptimal market outcomes (including monopoly) in check such as allowing PPIs to act as Payment System Providers (PSP) in the UPI and inviting applications to develop New Umbrella entities (NUEs), encouraging competition and reducing concentration risk for NPCI.

CICO interoperability: Aadhaar enabled Payment System

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BACKGROUND: AePS is a bank-led model which allows online interoperable transactions at PoS (MicroATM) through the Business correspondent (BC) of any bank using Aadhaar authentication.

- The AePS platform empowers a bank customer **to use Aadhaar as his/her identity** to access his/her respective Aadhaar enabled bank account and perform basic banking transactions like balance enquiry, cash withdrawal and deposit through a BC of any bank.
- The primary objectives of AePS are to **enable bank customers to do basic banking transactions through a BC** in places where having a bank branch is not viable, subserving the goal of furthering financial inclusion in the country. AePS facilitates interoperability across banks, helps with disbursement of government subsidies (transferred into a beneficiary's bank accounts through APBS) using Aadhaar authentication, and supports electronification of retail payments.
- Many agents also support "card based+PIN" withdrawal either through a POS or a mobile POS terminal** and (just like a MicroATM) cash is handed out by the agent from his till.
- Agent networks in India are largely managed either by banks directly or through BCNMs (Business Correspondent Network Managers). As of 2017, banks managed 31% of agents directly, while BCNMs managed the remaining 69%.
- While new players have emerged, public sector banks continue to lead agent networks in India e.g SBI agents make up 38% of total agents. Public sector banks dominate the rural areas, with a total of 83% of the market share.
- *Although supported by AEPS, this may have been stopped by NPCI in some places mainly owing to "round-tripping" concerns (agents make money when they just do cash in-out repeatedly). Another concern is that , banks are not incentivised to accept deposits from customers of another bank (effectively passing the deposit on to the other bank) without charging the customer. In some cases, the destination (issuer) banks may be compensating the recipient (acquiring agent) bank for conducting a cash deposit transaction.

AePS product offering:

- *Cash Deposit**
- *Cash Withdrawal*
- *Fund transfer*
- *Balance enquiry*
- *Mini Statement*

Source: NPCI

CICO interoperability

BFA GLOBAL

AGENT: Agent interoperability for Cash in Cash out services exists through Aadhaar enabled Payment System (AePS) however agents remain exclusive to a bank; NPCI implements control measures that promote interoperability while balancing interests of member banks

- Interoperable cash-in/cash-out system for BCs are enabled through AEPS (Aadhaar Enabled Payments System, however, BCs remain exclusive to a bank limiting the bouquet of additional services that can be made available at a BC for multiple banks and limiting the commissions that an agent can earn.
- Exclusivity ensures there is still incentive for financial service providers to roll out an agent network even if agent interoperability is required. In India, interoperable agents not only facilitate CICO, remittances, bill payments and balance inquiries on behalf of other banks but provide a richer suite of services for the acquiring bank e.g open a bank account, sell insurance etc
- AePS encourages shared infrastructure which reduces the cost to serve the end consumer. However, to compensate for the infrastructure cost, the (account) issuer bank currently pays an interchange fees to the (transaction) acquirer bank. The acquirer bank shares some portion of this fee with the BC as a commission for facilitating the transactions with evidence suggesting that interoperability leads to higher revenues for agents. However, some BCs were splitting one transaction into multiple transactions to earn more commissions. The NPCI then intervened **recommending issuer banks to implement limits on the number and value of transactions** based on their "risk appetite" while following RBI's guidelines.
- Soon banks came up with their own limits based on their BC network to mitigate financial risks in the system. However, NPCI realised that the lack of a standard limit may deny customers access to the service when in need and a year later in March 2020 another circular **mandated a standard monthly limit of minimum 10 transactions in a month and a monthly limit of Rs. 50,000** (whichever is reached earlier) for all member banks.

Source: BFA interviews (2020 -2021)

CICO interoperability

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BUSINESS MODEL: Possible alternatives to agent exclusivity can be tested for improved outcomes for customers and agents

- BCs remain exclusive to a bank. BC Network Managers (BCNMs) argue that there is some **need for agent non-exclusivity to be introduced** such that the agent is able to provide services like selling financial products (deposits, insurances) for multiple banks. This will not only be significantly beneficial for the customers as it promotes choice but also make the business more profitable and sustainable for the BCs by enabling additional commissions.

- However, our research indicates that introducing agent non-exclusivity may also introduce some risks in the system:
  1. **Liquidity challenges**: An agent is not a bank branch and the cash which he hands to the customer from his till is personal. Working for multiple banks may therefore introduce liquidity challenges such as cash constraints and maintaining multiple floats, as well as security risks for the agent.
  2. **Mis-selling**: It is also important to ensure that the agent is well-informed and does not encourage adverse selection of customers based on the commissions he earns.
  3. **Grievance redressal:** When partnering with multiple banks, it is also important to determine which bank will be responsible for the agent's non-performance or poor services to customers and where can the customers go for grievance redressal.

- A possible alternative to agent non-exclusivity is to **allow the BCNMs to migrate to a multibank model** such that they can connect to multiple transactional 'pipes' with different banks, rerouting their transactions through a secondary bank if the principal bank is unable to process the request thereby reducing failure rates. A similar solution has already been implemented for UPI and may be tested for BCs.

Source: BFA interviews (2020 -2021)

CICO interoperability

PERFORMANCE: BCs have greatly contributed to bringing banking services to the last mile. However, raising awareness of the interoperable services available to the customer can further enhance usage and increase trust in the system

- An average of 45.7% transactions conducted in 2020 were interbank, with the number of interbank transactions rising from 33.6% in January 2020 to 49.4% in January 2021.
- **Addressing cash-in/cash-out interoperability has had a direct impact on improving financial inclusion outcomes for disadvantaged groups and has the potential to create a bridge to transition onto digital payment platforms.** In order for interoperability to be truly inclusive, addressing cash-in/cash-out interoperability is a critical and important foundational step towards self-service digital payments (remittances, merchant payments, bill payments). Particularly for low-income groups who earn and spend in cash, seamless enabling of cash to digital and digital to cash may create the confidence to transition onto digital payment platforms.
- **Increasing trust and awareness**:
    - Limited awareness regarding the interoperable services available at the BC agents may limit the number of such requests that agents receive in reality.
    - Lack of trust amongst customers that are low on digital, financial and general literacy may still hinder usage of interoperable transactions where customers may worry that his/her money will get 'lost' in the web of integrated banking systems. Raising awareness regarding what is available to a customer can help further the objective of bringing financial services to the last mile through a BC.

Source: BFA interviews (2020 -2021)

Answers to Research Questions

Research question 1: Why interoperability? - Is interoperability necessary for full financial inclusion?

Interoperability in India exists across various payment instruments, networks and infrastructure of the payment systems enabled through interoperability of ATMs, PoS, Mobile Banking, PPIs, QR codes, BBPS.

Interoperability has improved payment choices for people enrolled with a formal account and with a modicum of digital familiarity but financial inclusion in India has been achieved through a combination of efforts and not by interoperability alone.

Research question 1: Why interoperability? - Is interoperability necessary for full financial inclusion?

- While account ownership in India grew from 53.1% in 2014 to 79.9% in 2017, both Findex and FII surveys agree that the **Pradhan Mantri Jan Dhan Yojana (PMJDY) was the principal driver in getting financial services to the last mile** by boosting account ownership among unbanked adults using Aadhaar biometric identification. Business Correspondents offering basic interoperable services including deposit and withdrawal have added impetus to financial inclusion efforts as banks can rely on BCs to reach the unbanked regions of the country. Interchange fees and switching fees across all payment mechanisms in the country are also kept low to boost interoperability and market acceptance.

- The primary objective of UPI was to increase digital payments adoption by building a solution that would be **mobile first, provided immediate money transfer 24*7, simple to use, and interoperable across banks**. UPI has successfully delivered on these objectives - the interoperable interface and underlying payments infrastructure, standardized message and value interchange across financial institutions keep ease of use at the core of its design. Consequently, digital payments in India have witnessed constant growth over the past 10 years with UPI witnessing exponential jumps in volume over the past four years of its launch.

- However, Immediate Payment Service (IMPs) is the leader with regards to values transferred largely brought in by cash remitted at PPI agents networks by unbanked users such as migrant workers and other underserved users who remain excluded from formal financial systems and consequently from digital payment mechanisms.

- While interoperability through UPI has allowed for increased competition, innovation and reduced costs, **deepening digital payments usage and adoption remains limited to a segment of the population that is banked and has access to a smartphone**. Despite the presence of a USSD channel, several issues limited its uptake excluding unbanked customers who do not own a smartphone from the UPI ecosystem.

- While evidence points to digital payments being well entrenched in Indian households across income groups, **there is scope for innovation to offer digital payment products for non-smartphone users** and for enhancing UPI use cases to offer accessible payments services to the unbanked.

Research question 2: What are the effective policy levers for achieving interoperability success?

Providing vision:

- The RBI has guided a conversation on interoperability by outlining strategic priorities through vision statements, payment system strategies, and other policy documents.
- Backing up the vision with material support: Policy makers in India used a variety of incentives to drive change.
  - In order to convene the National Payments Corporation of India (NPCI) as an umbrella organisation for operating retail payments and settlement systems in India, the RBI tasked the India Bankers Association to recruit banks willing to invest in the not-for-profit entity.
  - RBI also contributed to the economic stability of NPCI by **transferring the NFS/ Euronet switch to NPCI at a cost**, which along with the task of operating the Cheque Truncation System (CTS) constituted the main revenue source for NPCI (Cook and Raman 2019).
  - The government further supported NPCI by making the organization **a key actor in the distribution of social protection payments** through the Aadhaar enabled payments system (AePS) and by promoting the BHIM app.
  - Additional push by the government to allow account opening at BC agents using only the Aadhaar card and the mandatory linkage of Aadhaar to existing bank also contributed to accelerating the transition into Aadhaar based banking services.

Keeping up with change and fostering innovation over time:

- RBI has also mandated non-bank PPI issuers to participate in IMPS and over time in UPI in an interoperable manner to promote digital payments adoption amongst a wider audience.
- Last year, RBI also **invited applications to set up new umbrella entities to boost retail payments** in the country. Additionally, the RBI has **set up a framework for a regulatory sandbox**, which allows FinTechs from India to test their products within a controlled environment. In August 2020, RBI also announced setting up a Reserve Bank Innovation Hub (RBIH) to promote innovation across the financial sector by leveraging on technology and creating an environment which would facilitate and foster innovation.

Oversight - Consumer protection & managing risk:

- Overall, RBI has appeared as a forward thinking body that, beyond supporting the initial establishment of independent bodies that largely operate retail payments and settlement systems in the country, continues to monitor the retail payment space to ensure that innovation is not halted while guarding the interest of the customer and minimising risk in the system.

Research question 3:

When should the foundation or policy-makers advocate for interoperability - from the beginning or let it evolve over time?

- In India, interoperability has been at the core of the design for both UPI and AePS since the beginning and has been constantly monitored and enhanced to ensure it is incorporated across various payment instruments, networks and institutions.

- Overall, the India story tells us that while an underlying backbone and infrastructure is required from the beginning, continuous upgrades focussed on how the market is evolving are needed over time to ensure interoperability is retained and enhanced.

Other highlights to consider: **A2A interoperability Recommendations**

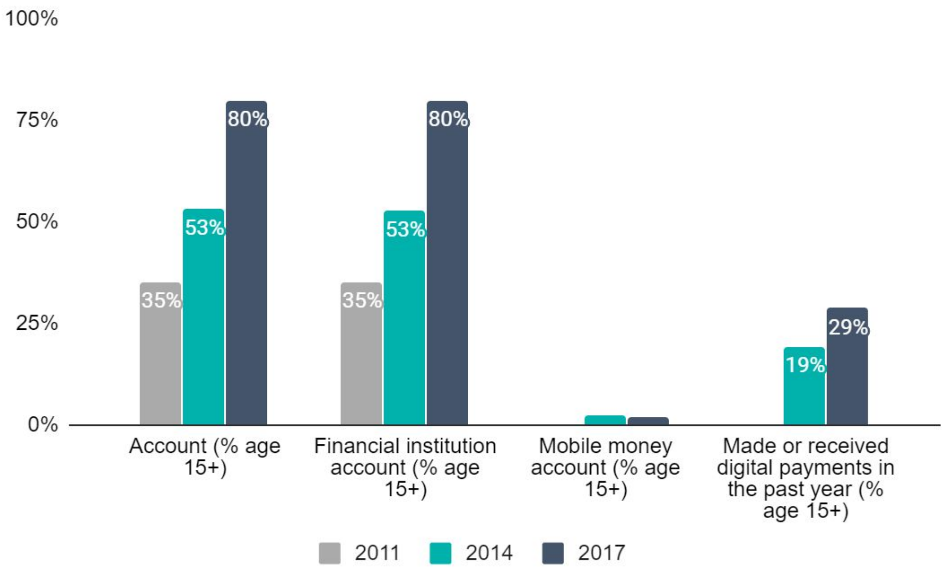
- **In consumer interest, regulators have to constantly lead, support, and facilitate the interoperability dialogue** between market participants who often have divergent commercial interests that can lead to suboptimal market outcomes (including monopoly) when left unchecked. **Regulators must stay vigilant and intervene** with policies that lower interoperability scheme entry barriers for participants so as to foster greater competitiveness which in turn spurs ongoing innovation.

- **Better outcomes prevail when regulators and policymakers consciously cede operational control as well as pricing decisions of interoperability schemes to participants.** Regulation must aim to incentivise participants/providers to improve customer outcomes and commit investments to support smooth functioning at scale. Suitable penalties must also be put in place to encourage system design that lowers failure rates and improves handling of failures.

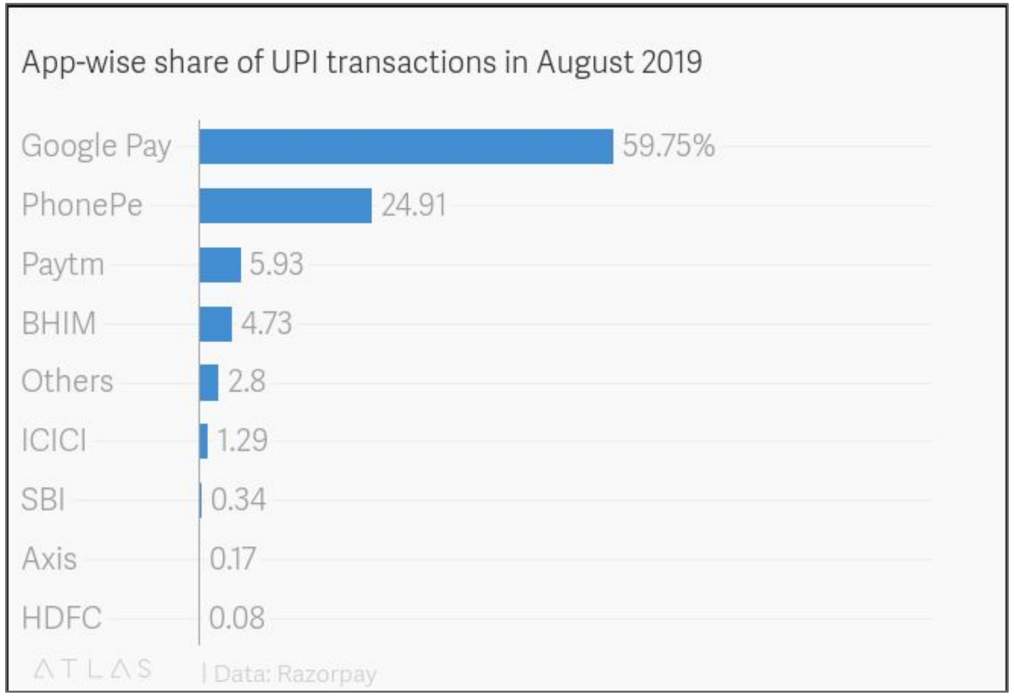
- **Providers must be allowed to retain the flexibility to exercise choice to build or partner, particularly when it comes to technologies and user experience design.** Providers who design meaningful solutions to address varying customer use cases are more successful in attracting customers as well as discovering revenue generating business models. (For example a feature for recurring payments, use of past transaction data to pre-populate fields to reduce customer data entry overheads for repeat payments, simple and clear messages about the transaction outcome and so on).

Additional Context

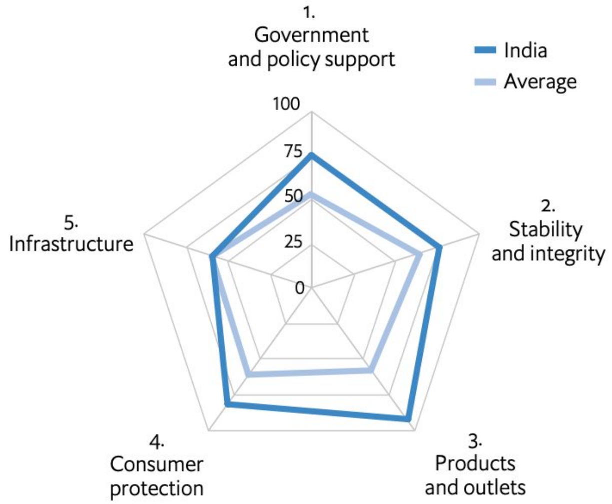
Country **context**



Source: FINDEX 2017

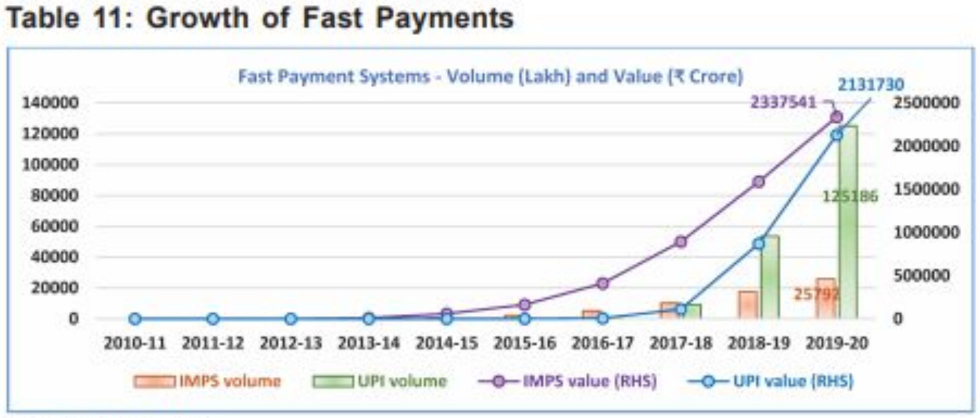


Quartz 2019



Rank	5
Score	71
Average score	52

Source: EIU Microscope 2019,



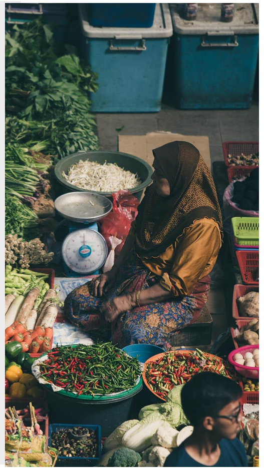
Source: RBI Data

Source: [RBI data]

A2A country **timeline**

Industry initiative initiated and strongly backed by the regulator to create industry solutions and achieve financial inclusion

1990s-2000 In 1990s Senior figures at RBI began to question how far the country's systems were far from global standards triggered an incremental process of policy reforms. In 2000, RBI formed an Advisory Group on Payment and Settlement Systems to explore these issues. Their findings, documented in the Advisory Group's report and later in RBI's Vision Document for 2005-2008, found that "it is only in very few countries that central banks operate retail payment system", among other regulatory gaps.



2007: The 2007 **Payments Act provided the legal basis for a new entity to manage retail payments** – the National Payments Corporation of India (NPCI). The Payments Act required that the organization be majority owned by public-sector banks.

2010: The **NPCI begun operations** in Jan 2010. The RBI tasked the India Bankers Association with forming the new organisation on a voluntary membership basis. Ten leading banks were recruited as shareholders: Six public-sector banks. two private domestic banks and two foreign banks to represent a cross-cutting base of Indian consumers. Although all the banks contributed about USD14 M to hold a 10% share in NPCI, RBI provided support in the form of subsidized start-up capital i.e., NFS switching infrastructure which processed majority of card transactions along with check clearing operations which all provided a revenue stream for NPCI from day one. NPCI also did not have to pay taxes on its earnings. The ownership model that began with 10 shareholder banks has expanded to 56 bank shareholders today. (CGAP 2020 & CGAP 2019)

2010: While NPCI began with core payment services it soon moved into interbank instant payments. **The Immediate Payments System (IMPS) launched** as a product for banks in 2010. However, the solution relied on a Mobile Money ID (MMID) – a unique identifier for account addressing – and was underused in the market.

2013: **In search of ways to make its growing list of products** (including IMPS) **fit together** better (become interoperable) , the NPCI team traveled to developed markets, such as the United Kingdom, to understand global best practices, but design a customised solution that meets local needs. At the same time (2013), India got a champion in the first Central Bank governor with extensive experience outside the country. He came into RBI pushing the types of faster payments solutions he had seen in markets like the United Kingdom.

Late 2014: NPCI introduced **a single USSD channel for India to promote interoperability** for feature phone owners to transact through the NPCI infrastructure regardless of the telecommunications provider.

2016: NPCI worked with iSPIRT, an open source volunteer developer community, to define and **develop the Unified Payments Interface (UPI)**. UPI standardized these messages to allow for seamless interoperable real-time mobile payments among institutions, including banks and nonbanks; channels, including web, smartphone apps, and USSD; and financial addresses, including mobile numbers, bank account numbers, and email-like virtual payment addresses. Like other products, UPI is considered a separate scheme. However, because it is an aggregation of other products that have their own scheme rules, scenarios can arise where several rules apply. The sending provider selects the scheme rules that will govern the transaction. Soft pilot was launched in April followed by the launch in August (NPCI 2016).

2016: Under an initiative driven by RBI in late 2016, NPCI and the international card schemes (Visa, Mastercard, and American Express) worked together to create **common messaging standards for QR codes in India.** These standards support QR-based transactions riding over the AePS rails for biometric authentication or over the UPI rails for non-biometric authentication.

A2A country **timeline**

2017: With support from iSPIRIT, **a common app, BHIM**, that runs on UPI rails, can be branded by any financial institution and used as its own was launched. BHIM was developed to ensure that varying qualities of banking apps do not to degrade the user experience and thus provide a standardized experience, and also incentivized a wider array of banks to be on the UPI as it lowered their investment costs. SInce then other companies, including Google Pay, PhonePe, Paytm and Mobikwik, have also launched their own UPI based apps. Banks are welcome to promote a proprietary app in addition to BHIM, but regulators watch carefully to ensure banks are putting sufficient weight behind the use and promotion of BHIM.

Aug 2018: On 16 August 2018, NPCI launched **UPI 2.0** with several new features, including an overdraft facility enabling customers to link their overdraft accounts to the payments system (Mint 2019), as well as a one-time feature allowing customers to pre-authorise a transaction and pay at a later date, and the invoice-in-the-box feature allowing customers to check the invoice sent by merchants before making a payment. The signed intent and QR feature enabled customers to check the authenticity of merchants while scanning the QR codes. Fintechs cannot use 2.0 yet.

Oct 2018: As of October 2018, RBI published **guidelines paving the way for Prepaid Issuers (PPIs) to connect directly to NPCI rails** which was previously limited to banks. Other wallet providers must continue to connect through a bank. Also, as of Oct, NPCI was processing 48% of all electronic payments transactions in India (CGAP 2019).

2019: Today, over 1,400 banks are members of NPCI. Around 160 of these are on UPI. Although this is a small percentage, these banks serve 95 percent of the country's banking customers. Many of the country's small banks that are not yet on UPI have not joined because of their limited technical capacity, but more banks are steadily coming online.

Jan 2020: The Finance Act of 2019 provided that no bank or system **provider should impose any charge on a payer using electronic modes such as RuPay powered debit cards, UPI and BHIM UPI and QR code-based UPI payments.** Subsequently, in a circular issued on December 30, 2019, the Central Board of Direct Taxes (CBDT) clarified that any charge including the **merchant discount rate (MDR), shall not be applicable on or after January 1, 2020** on payments made through electronic modes (ETtech 2020). It is expected that banks are duty-bound to provide for payment infrastructure through their cash management savings. MDR charges were earlier charged by banks subject to a cap of 0.60% of card-based transactions for payments over Rs 2,000. As for transactions below the threshold, the digital cost was borne by the ministry of electronics and information technology (MeitY). Moreover, **every business with a turnover above Rs 50 crore is to provide the option of digital payments** through UPI, RuPay card and QR code to all customers (Financial Express 2020). Non-compliance results in fines.

Feb 2020: NPCI agreed to revise the UPI interchange and payment service provider fees to "zero" for all domestic UPI merchant (P2M) transactions with retrospective effect from January 1, 2020. The abolition of the fees was made for an interim period until April 30, 2020. The move to do away with these transaction fees came after the abolishment of the Merchant Discount Rate (MDR) by the Ministry of Finance. The banking industry requested NPCI to zero rate interchanges, switching fee, and payments service provider fees as these could not be sustained without an MDR being in place (CNBC 2020). In July, NPCI CEO noted they are trying to get MDR restored due to negative effects the zero-rating has had on the industry (Entrackr 2020).

July 2020: **UPI channel clocked an all-time high volume of 1.5 billion transactions in July** (ETtech 2020). Digital payments using UPI QR are approximately over 250 million on a monthly basis (Entrackr 2020).

A2A country **timeline**

Jan 2020: In its three years of operations, UPI has seen tremendous growth on the back of the presence of homegrown as well as overseas players in the segment. If we compare the number of transactions UPI processed on a year-on-year basis (2018-19), it has recorded 187% or ~ 3X jump aggregating 10,787.54 million or 10.8 billion transactions in 2019, according to data sourced from NPCI (Entrackr 2020b).

Aug 2020: The National Payments Corporation of India (NPCI) has set up an **international subsidiary to sell the technology behind its RuPay network and Unified Payments Interface (UPI) to other countries.** The NPCI says several countries have "displayed an inclination" to build real-time payment systems and domestic card schemes inspired by the UPI and RuPay. In response, NPCI International Payments Limited (NIPL) has been set up, led by former Mastercard and Visa exec Ritesh Shukla, who is charged with developing a business strategy to make money by deploying NPCI's technology in international markets (Finextra 2020).

Aug 2020: RBI releases framework for authorisation of a new pan-India Umbrella Entity for Retail Payments who could be a promoter or promoter group who has three years of experience in the payment ecosystem, as a Payment System Operator (PSO) / Payment Service Provider (PSP) / Technology Service Provider (TSP). The objective of creating New Umbrella entities is to set-up, manage and operate new payment system(s) especially in the retail space; operate clearing and settlement systems ;develop new payment methods, standards and technologies; monitor related issues in the country and internationally; take care of developmental objectives like enhancement of awareness about the payment systems

Nov 2020: The National Payments Corporation of India decided to impose a cap on the share of Unified Payment Interface transactions that a single payment application can process. Per the NPCI circular, starting January 2021, initiated through Third Party Application Provider (TPAPs) shall not exceed 30% of the overall volume of transactions processed in UPI during the preceding three months (on a rolling basis). The TPAPs who were live at the time of the circular were given a period of two years from January 2021, to comply with the same in a phased manner.

CICO country **timeline**

CICO Interoperability exists in its truest form. BC technology serves customers of different providers

2006: As an initiative for increasing banking outreach and ensuring greater financial inclusion, **RBI issued guidelines in January 2006 t**o enable banks to use intermediaries in providing financial and banking services through the use of **Business Facilitator and Correspondent models** (RBI 2006). Banking agents in India provide a range of services to customers. They are allowed to conduct basic transactions such as: account opening, cash-in/ cash-out, bank transfer, recurring deposit, fixed deposit, loan repayment etc. They also provide services for extended products like insurance and pension. Depending on the type of BC, they can help the banks in creating awareness about basic financial products, and collection of applications and documents for the products. BCs in India can also provide services for registration under various government schemes, utility bill payments, and mobile phone top-up. (MicroSave 2020)

2008: A committee headed by former Executive Director of the RBI, R. B. Barman, recommended a framework for Electronic Benefit Transfer (EBT) for government-to-person (G2P) payments through banks and BCs. Different state governments began pilot-testing digitization of G2P payments. BC and agent networks were also expanded to remote rural areas with the EBT initiative. with the EBT initiative.

2009: Initially, banks were not allowed to collect any charges from the customers for providing services through BC, close to the location of the customers. Subsequently, **banks were allowed in November 2009 to collect reasonable service charges for BC services** from customers in a transparent manner under a Board-approved policy.

2010: RBI allowed **for-profit organizations to become BC agents.** Retired employees and Common Service Centers (CSCs) were also allowed to become BC agents. Also, **RBI permitted a BC to be a BC for more than one bank.** (RBI 2010)

In March 2012, conditions were further relaxed and **interoperability at the retail outlets or sub-agents of BCs (i.e. at the point of customer interface) was allowed**, provided the technology available with the bank, which has appointed the BC, supports interoperability, subject to stipulated conditions: a) The transactions and authentications at such retail outlets or sub-agents of BCs are carried out on-line; b) The transactions are carried out on Core Banking Solution (CBS) platform; and c) The banks follow the standard operating procedures to be advised by the Indian Banks' Association (IBA). (RBI 2012)

2014 The national mission for financial inclusion Pradhan Mantri Jan Dhan Yojana (PMJDY) led to a scale-up of the BC model. BCs were renamed "**Bank Mitr**" (bank friend) after the launch. It improved their business case and sustainability.

2020: In a circular, issued on March 16, the National Payments Corporation of India directed all member banks to enable cash withdrawal services at merchant locations using the UPI platform from June 1, 2020 onward. (BloombergQuint 2020)

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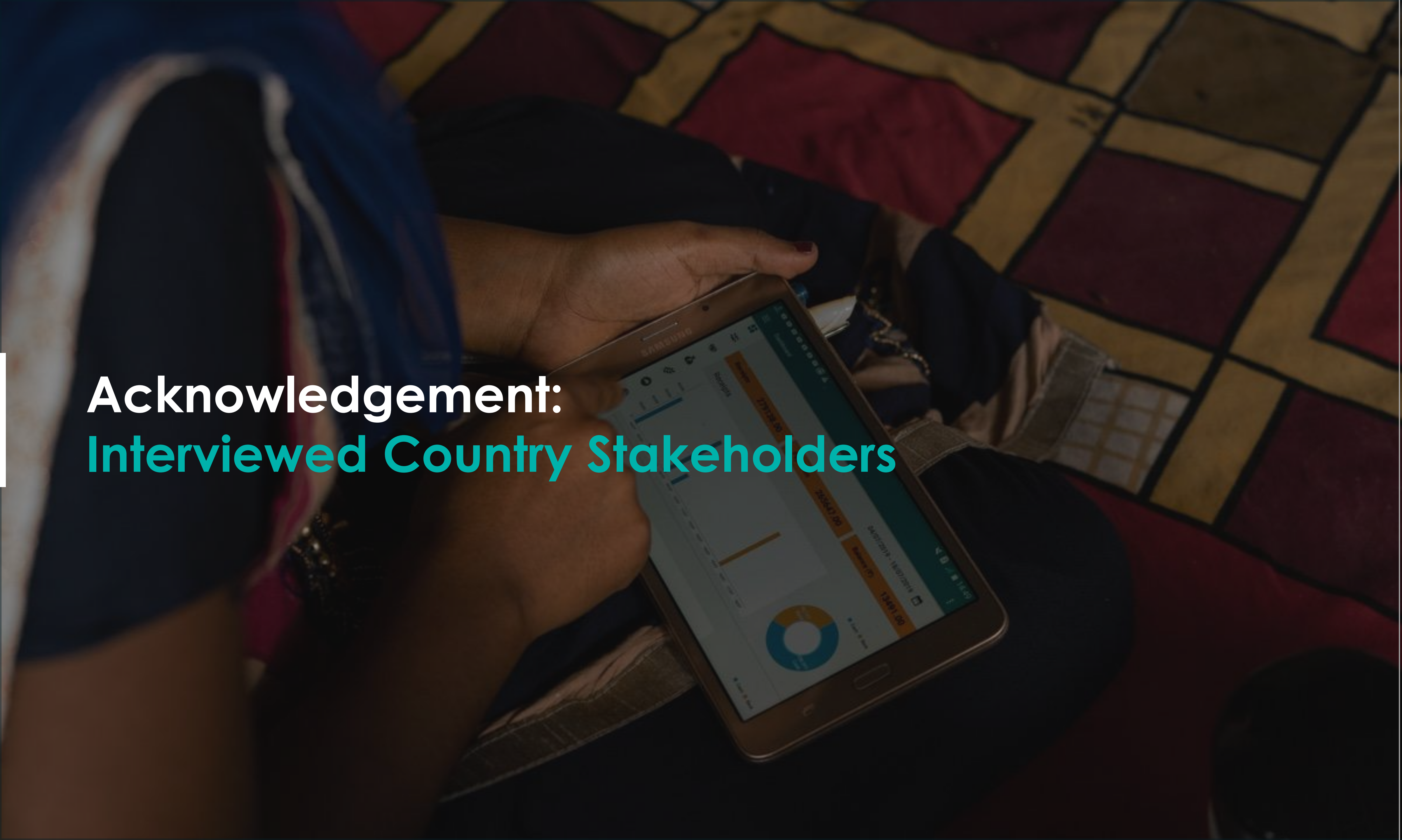

Acknowledgement:
Interviewed Country Stakeholders

Acknowledgements to India Stakeholders:

BFA GLOBAL

Name	Position	Organisation
Regulators		
Gopalaraman Padmanabhan	Former regulator	Reserve Bank of India (RBI)
Vijay Chugh	Former regulator	Reserve Bank of India (RBI)
Participants		
Anand Bajaj	Founder & CEO	Nearby Technologies
Abhinav Sinha	Co-founder	Eko India financial services
Confidential	Policy Director	Third Party App Provider (anonymous)
Payment Experts / Other Ecosystem Players		
Anand Raman	Payments Expert	CGAP
Rajesh Bansal	Payments Expert	Reserve Bank of India & Unique Identification Authority of India (Previous org.)
Naveen Surya	Founder and Director	So Hum Bharat Digital Payments