



Digital Payments in India: A US\$10 Trillion Opportunity

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Founded in December 2015, PhonePe has become a homegrown success story, with its meteoric growth powered by India's emerging digital ecosystem, particularly in the Unified Payments Interface (UPI) space. The company builds products and offerings tailored for the Indian market and has emerged as India's largest payments app, enabling digital inclusion for customers and merchants alike. With 380 million registered users, one in four Indians are now on PhonePe. We have also digitized 30 million offline merchants spread across Tier 2,3,4 and beyond, covering over 99% pin codes in the country. PhonePe is proud to help lead India's country-wide digitization efforts and believes that UPI and PhonePe is a powerful public private collaboration that has made the Indian digital ecosystem a global exemplar.

PhonePe Pulse

PhonePe Pulse highlights trends and insights on digital payments in India. PhonePe Pulse was launched in September 2021 with the aim to demystify data on the Indian digital payments landscape and give back to the ecosystem. Pulse is a novel interactive platform that is India's go-to destination for accurate and comprehensive data on digital payment trends. With over 46% market share, PhonePe's data is representative of the country's digital payment habits. With its rich repository of trends, insights, and in-depth analysis, Pulse showcases India's beat of progress in the digital payment landscape.

Preface

This report is a joint initiative of Boston Consulting Group (BCG) and PhonePe.

As part of the collaborative efforts, BCG has brought to bear its deep industry expertise in payments and fintech domain globally. PhonePe has brought its deep insights & expertise as the market leader in Indian digital payments and has also leveraged its extensive Pulse database providing top digital payments trends in India.

Together, BCG and PhonePe look forward to engaging with you on the exciting subject of what the future holds for the digital payments space in India and ascertain the factors and enablers that will unlock the massive growth potential we foresee.



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Executive summary

India's digital payments landscape has transformed dramatically over the past five years. Today, 40% of payments (by value) are digital, contributing to a US\$3 trillion digital payment market on account of rapid expansion in digital infrastructure, UPI-led migration to digital, pandemic-led acceleration of shift in customer preferences, growing merchant acceptance network and disruptive innovations by fintechs.

Despite this explosive growth, certain segments of the market remain underpenetrated with considerable room for growth. The next wave of growth is likely to come from Tier 3-6 locations, as evidenced in the past two years wherein Tier 3-6 cities have contributed to nearly 60-70% of new mobile payment customers.

Expanding merchant acceptance, digitization of value chains, and establishment of financial services marketplace in underpenetrated segments are the primary factors that will spur the rapid growth of digital payments in India. The emergence of embedded payments via 5G and the Internet of Things (IoT), and the launch of India's sovereign Digital Rupee are, together, expected to provide further impetus.

India's digital payments market is at an inflection point and is expected to more than triple from US\$3 trillion today to US\$10 trillion by 2026. As a result of this unprecedented growth, digital payments (non-cash) will constitute nearly 65% of all payments by 2026 i.e., 2 out of 3 transactions (by value) will be digital.

India will become a digital payment economy and merchant payments will emerge as the most powerful

driver of this growth especially in the offline segment due to growing QR code deployments. We expect that merchant payments will soon outpace person-to-person fund transfers.

As we see digital payments get embedded in all forms of commerce, we will also witness the progression from embedded payments to embedded finance. As more merchants begin to accept digital payments, it will unlock a significant change in access to credit for small merchants due to creation of a digital transaction trail. With 35-40% of MSME lending demand unmet today, increasingly more and more merchants will have access to formal credit.

A key challenge facing payment players across the board today is thin margins, which prompts players to increasingly transition to high-margin offerings while doubling down on digital payment growth. These players have built a large captive customer base with access to rich customer data and purchasing behavior patterns and can diversify existing payment revenue streams by foraying into lending and investment facilitation among other avenues. Thus, super app ecosystems will emerge!

Unlocking the US\$10 trillion opportunity requires certain enablers. There is a continued need to build customer trust through a comprehensive approach to address fraud management, simplify digital onboarding and KYC, reduce strain on tech infrastructure of banks, allow better economics for payment players and, finally, strengthen the country's digital infrastructure.

Chapter 1:

Explosion of digital payments



Explosion of digital payments

The Indian payment ecosystem has undergone a paradigm shift in recent years, especially in the past two years with the Covid-19 pandemic forever changing how users transact. Our estimates show that 2 out of 5 transactions¹ are digital today amounting to approximately US\$3 trillion²; their distribution across transaction types is shown in Exhibit 1.

Rapid expansion of digital infrastructure

The combination of bank account penetration through the Jan Dhan Yojana program³ with 440 million bank accounts opened so far, 1.25 billion Aadhaar-based unique identification numbers enabling KYC, over a billion mobile devices and low-cost internet accessed by more than 750 million users have acted as the foundation for the relentless growth in digital payments, collectively called the JAM trinity (Jan Dhan, Aadhaar, Mobile).

We believe five key factors have revolutionized digital payments in India:

- 1** Rapid expansion of digital infrastructure
- 2** Accelerated migration to digital led by UPI
- 3** Shifting customer preferences for contactless driven by the pandemic
- 4** Increased merchant acceptance of digital payments
- 5** Tech disruptions and enablement by big tech and fintech

Exhibit 1 - 2021 Digital Payment Transactions of ~USD 3 Tn

2021 digital txn values (in USD Tn)



Source: BCG and PhonePe Pulse analysis.

¹ Includes only SME transaction and not large corporates

² Excludes financial services

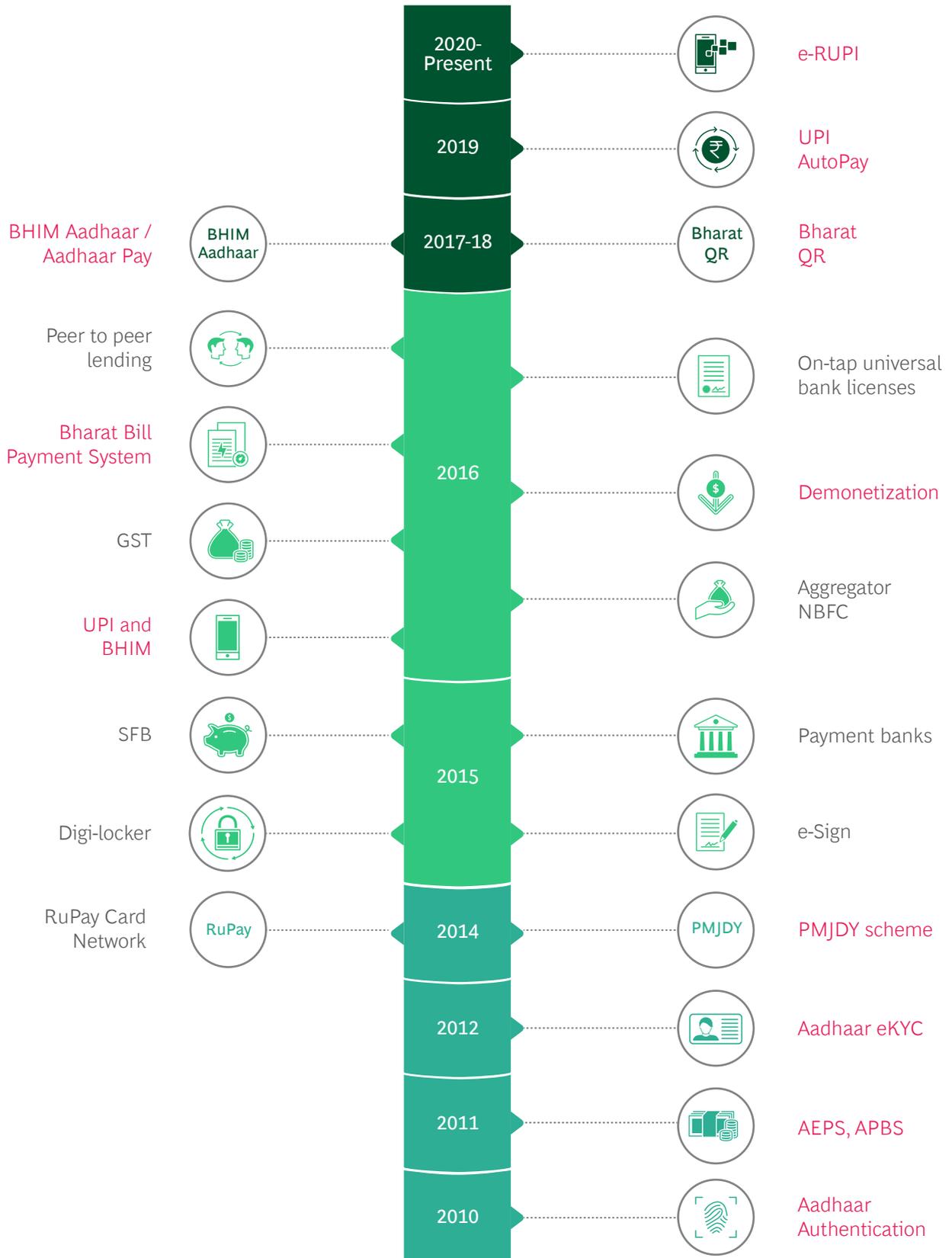
³ Currently G2B and G2G kept out of scope due to limited mobile uptake in future

¹ Approx 40% transactions digitized today by value of transactions

² Excludes financial service, large corporate B2B, G2B and G2G payments

³ PMJDY (Pradhan Mantri Jan Dhan Yojana) was launched in India in 2014 to drive financial inclusion with universal access to banking facilities, providing zero balance accounts and interest on deposits

Exhibit 2 - Series of Digital Enabled Initiatives have Revolutionized India's Financial Service Landscape



Source: India Stack website, ispirit presentation.

● High impact initiatives

As shown in [Exhibit 2](#), India Stack infrastructure and creation of UPI has opened doors to endless opportunities to spur innovative offerings and services to users. While UPI has revolutionized digital payments with interoperability and mandates, other rails such as the Bharat Bill Payment System (BBPS) have made the onerous task of bill payments a thing of the past, and the National Electronic Toll Collection (NETC) has digitized toll collections across the country. Moreover, QR code standardization has played an equally pivotal role to simplify merchant acceptance infrastructure providing uniform user experience for users and merchants alike.

Adoption of these protocols and public goods by private players such as third-party application providers (TPAPs) and wallets has made digital payments a public-private partnership (PPP) success story. Market creation by these private players has catalyzed the adoption of digital payments. For example, PhonePe has made deep investments in technology infrastructure (e.g., self-managed data centers in Mumbai and Bangalore), network connectivity (e.g., direct connectivity with NPCI, partner banks, and BBPS), and merchant acceptance

infrastructure (e.g., 30Mn+ offline merchant acceptance points) to significantly drive adoption of digital payments.

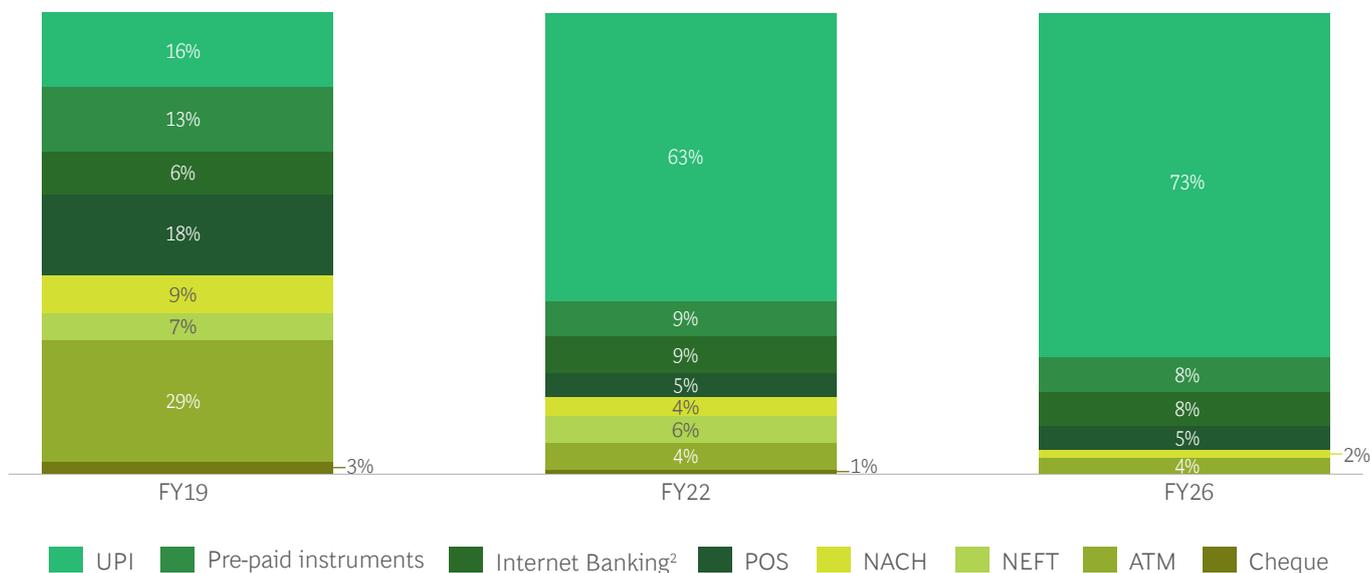
Accelerated migration to digital led by UPI

The UPI system has supercharged India’s transition to non-cash payments, especially in person-to-person (P2P) fund transfers and low value merchant (P2M) payments. Not surprisingly, UPI saw about 9x transaction volume increase in past 3 years, increasing from 5 billion transactions in FY19 to about 46 billion transactions in FY22; accounting for more than 60% of non-cash transaction volumes in FY22.

Led by an open and interoperable architecture with direct payments linked to a bank account without the need to top-up wallets, UPI transactions are at approximately 9x of credit and debit card transactions today in volume terms in FY22. Yet, this is just the beginning of the journey; UPI is estimated to grow and drive ~75% of total digital transaction volumes in five years as depicted in [Exhibit 3](#).

Exhibit 3 - UPI Adoption Expected to Rise

Volume of non-cash transactions¹



Source: RBI data, NPCI, BCG Analysis.

¹ Non-cash transactions excludes cash transactions and cash transactions at branches includes cash transactions at ATMs

² Internet transactions include RTGS, AePS, ABPS, NETC, and IMPS financial transactions. ATM includes financial transactions only

Note: Total may not sum to 100 because of differences due to rounding off

Shifting customer preferences for contactless driven by the pandemic

The pandemic has been a watershed moment for disruptions in customer behavior, ushering irrevocable changes to the way we live, play and work.

A key outcome of the many significant shifts in customer behavior was an acceleration of digital payments in India. Customers switched to e-commerce and contactless modes of digital payment to minimize contact and infection risk. More than a 50% jump was observed in monthly transaction volumes across UPI, BBPS, Immediate Payment Service (IMPS) over 6 months following the imposition of lockdown in March 2020.

The BCG Center for Customer Insight's (CCI) Covid-19 Consumer Sentiment Survey conducted in July-August 2020⁴ showed a marked decrease in cash usage among 50% customers, with more than 60% customers shifting to UPI and digital wallets as compared to pre-covid times. Furthermore, 60% of surveyed customers showed a strong likelihood of continued use of digital payments in the future, a trend that is evident in the recent increase in digital payments.

Increased merchant acceptance of digital payments

The past few years have witnessed rapid merchant onboarding to digital payments driven by the ease of

use and low setup and maintenance costs associated with QR codes. Moreover, fintech players have played a crucial role in driving the off-take of QR code placement at merchant point of sale (POS).

QR payments are accepted by more than 30 million merchants, a 12x increase from just 2.5 million merchants accepting QR payments five years ago. However, growth in total number of POS machines, approximately 6 million in FY22 (including one merchant having multiple POS machines), has remained stagnant in comparison. QR code acceptance has also penetrated amongst 75% business to consumer (B2C) merchants⁵. This has driven merchant payments, increasing from about 12% share in UPI volumes in 2018 to more than 45%⁶ in 2021, based on PhonePe Pulse transaction trends data, as seen in Exhibit 4.

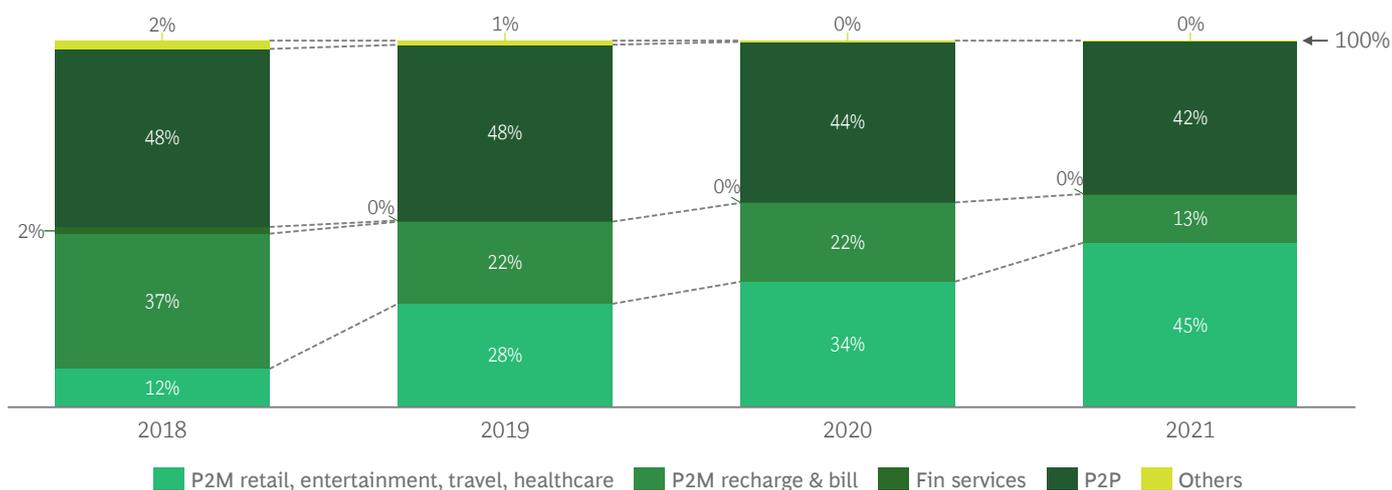
Tech disruptions and enablement by big tech and fintech

India saw substantial startup funding with customer payments players witnessing investment flows to the tune of US\$1.4 billion in 2021⁷.

The digital payments ecosystem has been positively disrupted by the entry of multiple new players with diverse offerings such as TPAPs driving payments at scale, and niche players offering value added services through Buy Now Pay Later (BNPL) options or new gen credit scoring with payments data.

Exhibit 4 - Digital Merchant Payments' Share Growing Sharply

Share of volumes (%)



Source: PhonePe Pulse, NPCI data, RBI, BCG analysis.

⁴ Question text: "In the last 3-4 months, which channels have you started using for the first time as a result of Covid-19?", "Once the lockdown opens up, how will your usage behavior change as compared to before the lockdown?"; BCG COVID-19 Consumer Sentiment Survey 20 Jul-2 Aug 2020 (N = 3,000)

⁵ Total MSME merchants at ~63 Mn, of which B2C merchants expected at 40 Mn

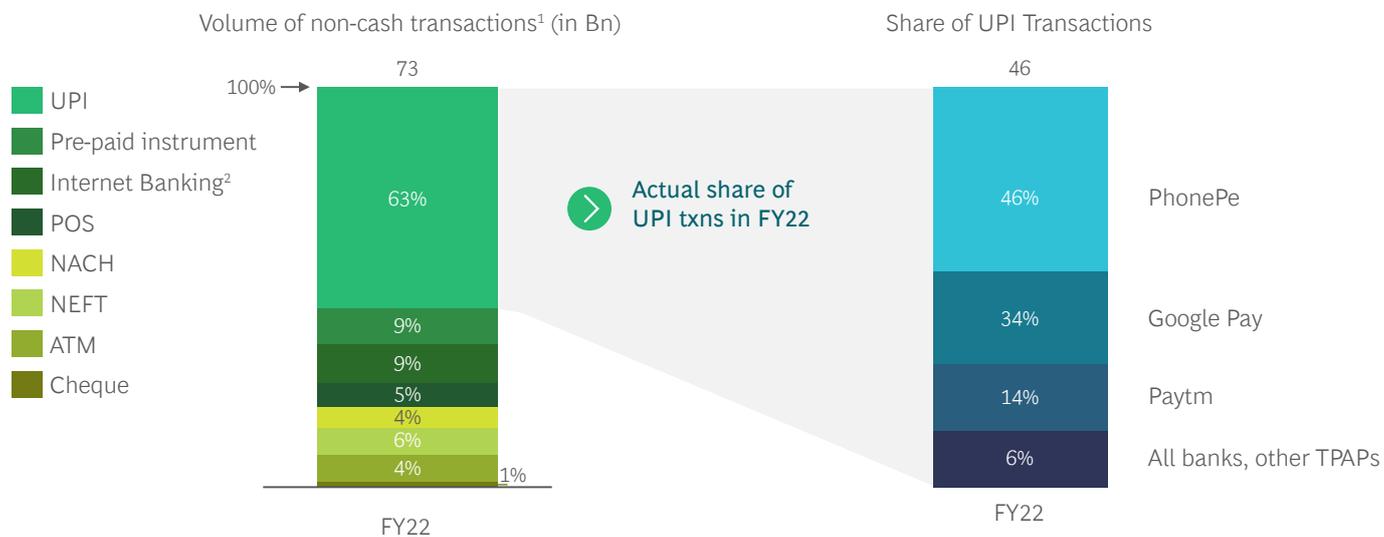
⁶ Merchant payments including online and offline merchants

⁷ Data from Venture Intelligence as of 31st Dec 2021; 2019-2021 funding CAGR of 15% excluding IPOs, 2020 funding impacted due to Covid

Tech giants and leading Indian fintech players have thus been key drivers of UPI adoption in India among end users and merchants with user-friendly transaction

interfaces and innovative offerings; furthermore supported by an open API ecosystem, as depicted in [Exhibit 5](#).

Exhibit 5 - Fintech and Big Tech as Major Drivers of UPI Adoption



Source: RBI data, NPCI, BCG Analysis.

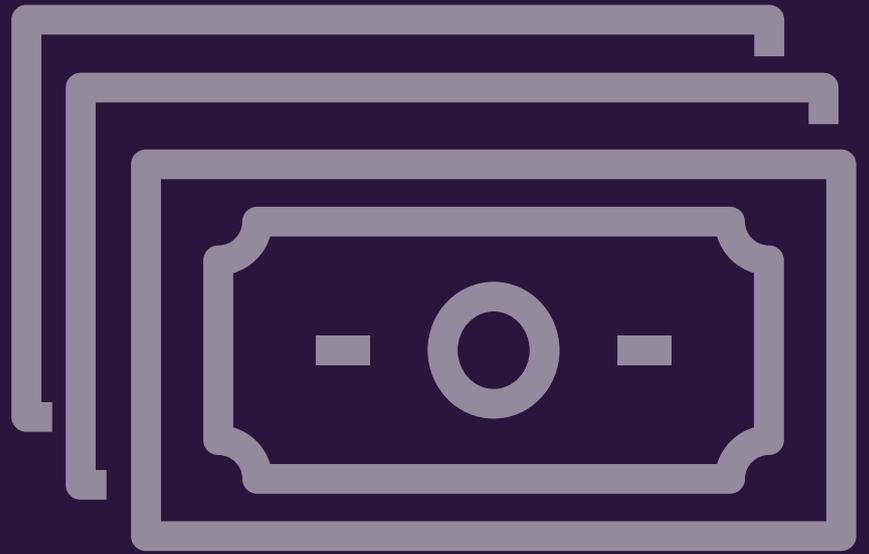
¹ Non-cash transactions do not include cash transactions at branches

² Internet transactions include RTGS, AePS, ABPS, NETC, and IMPS financial transactions. ATM transactions include financial transactions only

Note: Total may not sum to 100 because of differences due to rounding off

Chapter 2:

Cash will no longer be king



Cash will no longer be king

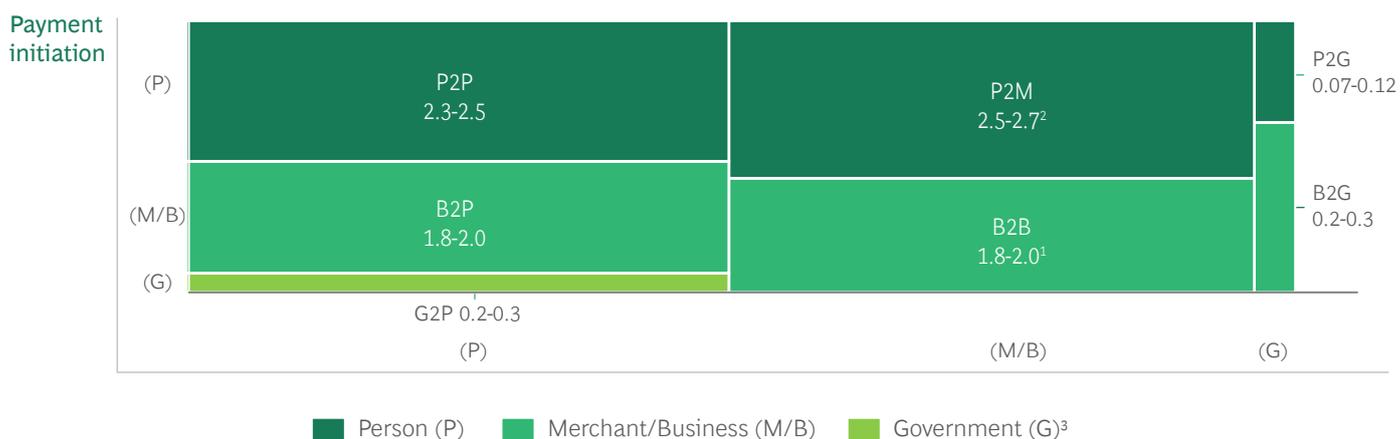
The digital payments landscape in India has developed significantly over the past decade and we expect digital payments market to more than triple to US\$10 trillion by 2026, as seen in [Exhibit 6](#).

We expect that 2 out of every 3 payment transactions would be digitized by 2026; thus inverting the digital

(non-cash) contribution to payments by value from approximately 40% today to about 65%, as seen in [Exhibit 7](#). The major contribution for the digital payments' growth would be from merchant payments, that are expected to significantly digitize in the next five years, increasing from 20% digital penetration by value today to about 65% by 2026, a 7x growth from US\$0.3-0.4 trillion digital merchant payments today to US\$2.5-2.7 trillion by 2026, as seen in [Exhibit 7](#).

Exhibit 6 - 2026 Digital Transaction Sizing of ~USD 10 Tn

2026 digital txn values (in USD Tn)



Source: BCG and PhonePe Pulse analysis.

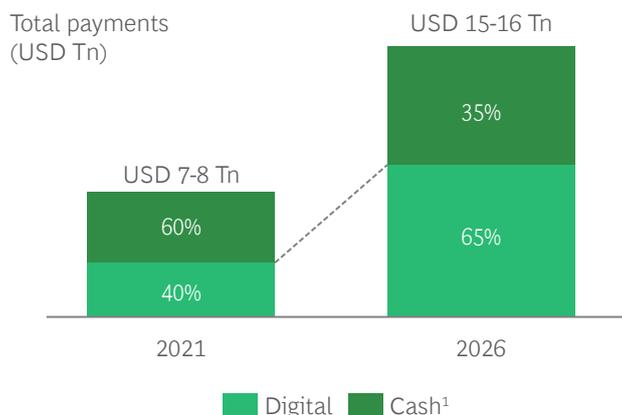
¹ Includes only SME transaction and not large corporates

² Excludes financial services

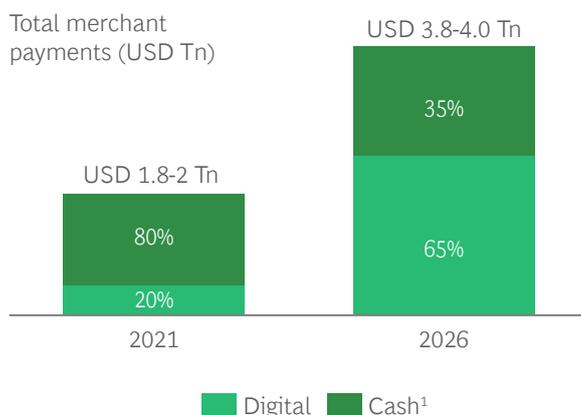
³ Currently G2B and G2G kept out of scope due to limited mobile uptake in future

Exhibit 7 - Merchant Payments to be Major Driver of Digital Payments by 2026

65% of overall payments to be digital by 2026²



Digital merchant payments expected to be 65% by 2026



Source: BCG and PhonePe analysis.

¹ Includes non-digital paper instruments

² Values exclude financial services, B2B payments for large corporates, G2B and G2G

Furthermore, digital customer expenditure on merchant payments has already begun to outpace P2P fund transfer, based on trends observed via PhonePe Pulse data in [Exhibit 8](#); and this trend is expected to continue with digital merchant payments growing approximately 2x faster than digital P2P fund transfers.

Expanding merchant acceptance

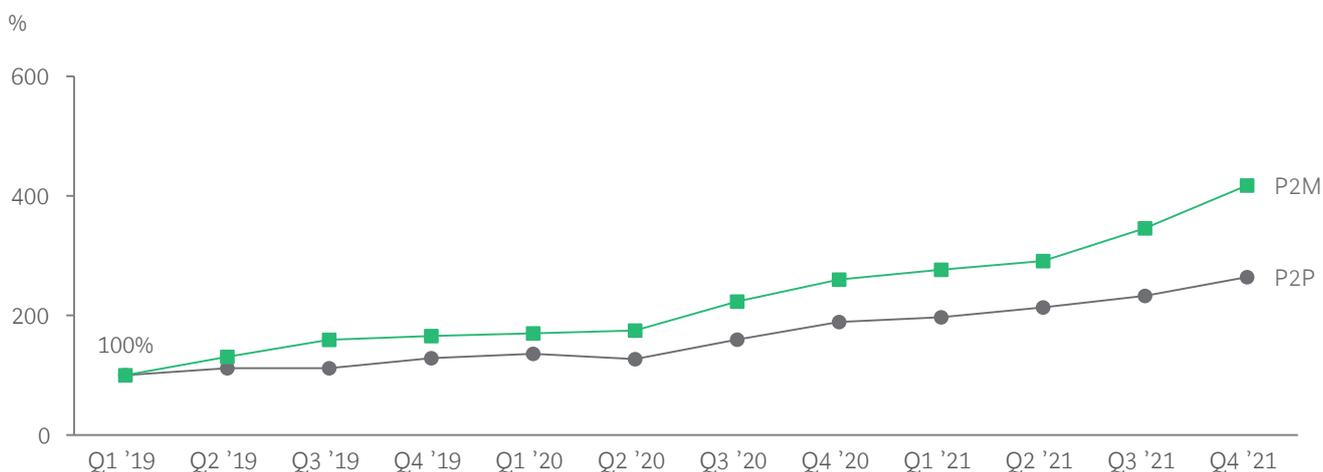
Although the cost of accepting digital payments has significantly decreased today, led by zero MDR in UPI and Rupay debit cards, a few pockets of small and micro merchants still favor cash-based payments. Among some of the most important factors to onboard such underpenetrated merchant segments is rapid deployment of low cost QR codes and engagement through integrated POS solutions.

The growth in digital payments will be driven primarily by four factors:

- 1 Expanding merchant acceptance
- 2 Infrastructure push and set up of a financial services marketplace driving growth in underpenetrated regions
- 3 Digitized value chains increasing digital payment adoption
- 4 IoT, 5G and CBDC lending further impetus

Exhibit 8 - Digital Customer Spend for P2M Merchant Payments Outpacing P2P Fund Transfer

Digital customer spend = total payment value / active customers (indexed at Q1 '19)



Source: PhonePe Pulse data.

• Rapid deployment of QR codes at offline merchants

We expect the offline segment to account for about 75% of all digital merchant payments, primarily due to increased use of QR based payments at POS, as seen in [Exhibit 9](#).

There are currently about 30 million B2C merchants who accept QR code payments at POS and this number

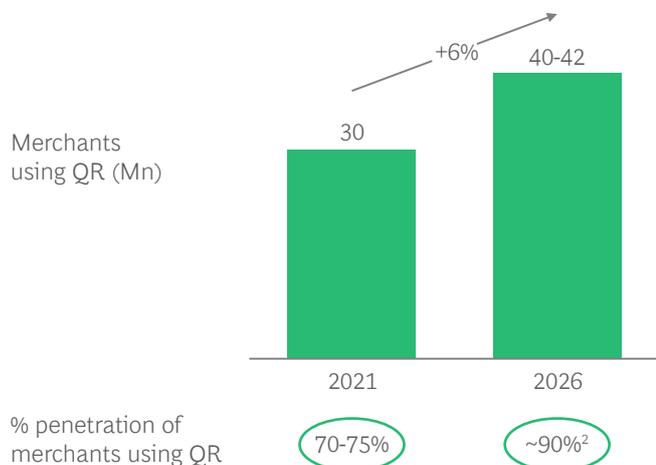
is poised to increase to cover about 40 million merchants. The offline unorganized segment will be the major driver of merchant payment digitization with QR codes, with the remaining coming from organized offline and online merchant payments, including bill payments and recharges.

Moreover, the higher cost of accepting cash could drive the merchants to shift to digital payments. While a merchant accepts cash for free at point of sale due to

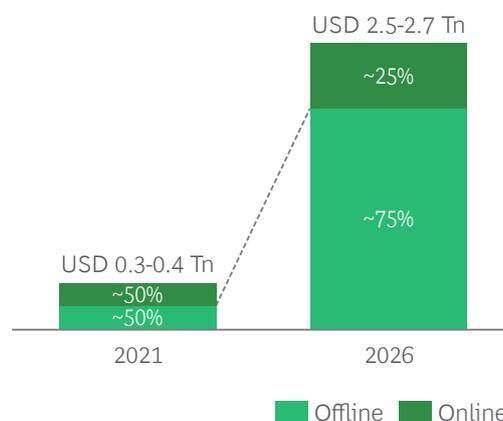
Exhibit 9 - Rapid QR Deployment to Drive Digital Merchant Payments in the Offline Segment

~40 Mn merchants expected to adopt QR based payments by 2026

Hence, driving digital payments in the offline merchant segment



Digital merchant payments (USD Bn)¹



Source: Government of India MSME annual report 2020-21, BCG and PhonePe Pulse analysis.

¹ Values exclude financial services

² Considering B2C merchants; excludes ~20 Mn B2B merchants

absence of merchant discount rate (MDR), there are several indirect costs of cash acceptance, such as secure transportation & depositing cash at bank, cost of theft & handing errors, and labor costs to collect & reconcile cash payments. The low cost of QR code installation and maintenance with sustainable MDR (currently zero for UPI) would drive merchants to adopt digital payments.

- **Greater merchant engagement through integrated POS solutions**

The engagement of merchants could be further increased by offering solutions that meet vertical needs, such as POS terminals embedded with supply chain accounts payable and receivable management, inventory management and customer relationship management (CRM) tools. Integrated POS solutions could allow merchants to manage their activities and payments on a single platform, automate supplier payments and receivable collection, and drive footfall with targeted loyalty services to customers.

Infrastructure push and set up of a financial services marketplace driving growth in underpenetrated regions

There is no doubt that India has come a long way in digital payments. However, Tier 3 cities and beyond and India's vast rural heartlands remain underpenetrated, with significant scope for growth, driven by steadily expanding payments infrastructure and the development of a financial service marketplace.

- **Digital payment penetration is skewed in India**

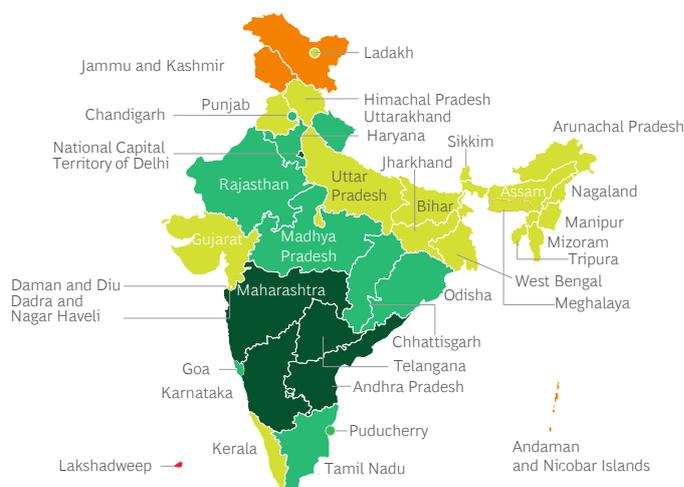
An extrapolation of the India transaction trends from PhonePe Pulse data tells us that digital payments penetration in India was much lower in 2018, especially in the North, North-East, and Central states. However, over the past three years since then, penetration has significantly increased, albeit unevenly, as seen in [Exhibit 10](#). States like Maharashtra, Telangana, Andhra Pradesh and Karnataka are up ahead.

Exhibit 10 - Digital Transaction Penetration has Grown Unevenly Across States; Higher Penetration in Southern and Western India

Digital transaction volume penetration 2018



Digital transaction volume penetration 2021



Lower 5 txn per 100 Higher 1300 txn per 100

Source: PhonePe Pulse, BCG analysis.

Note: Heat map basis volumes of transaction per adult population per month (15-65 yrs age), Q4 numbers taken across years

At a granular level, Tier 1-2 cities, have already seen high penetration of digital payments, with a major share of digital savvy users, easy access to information on use of digital payments and ubiquitous presence of QR codes at merchant POS. In comparison, penetration in Tier 3-6 cities show headroom for growth. Basis PhonePe user trends, over the past two years, 60-70% of new users have come from Tier 3-6 locations. The next wave of growth is expected to continue being driven by these locations.

• Access to reliable internet and inexpensive mobile data

Digital payments penetration is correlated with access to low-cost and reliable internet, which ensures successful transactions and enhanced customer experiences. Infrastructure enabled by comprehensive 4G coverage, access to stable and low-cost internet, and smartphone use will be the key to ensure that segments with low penetration are able to catch up and join India's digital payments revolution.

• Building a marketplace crucial to enable participation of rural users

Building a financial services marketplace in underpenetrated regions will be crucial to enable participation of rural customers in financial activities; driven by financial literacy with guidance on getting started and using digital payments.

As proposed by the Honorable Finance Minister in her 2022 Budget speech, a financial services marketplace could be developed by the large network of post offices that would be linked to the core banking system and the Digital Banking Units (DBUs) set up by the banking ecosystem. This would help set the required marketplace to offer a bouquet of banking services tailored for a semi-urban and rural ecosystem.

Additionally, to unlock adoption of digital payments at scale, it would be imperative to drive innovative instant payment services such as UPI 123Pay to digitize payments among customers using feature phones.

Through UPI 123Pay, the feature phone user could undertake payments using a pre-defined IVR (Interactive voice response) number, payments via missed call, through app developed for feature phones or proximity sound-based payments.

Digitized value chains increasing digital payments adoption

Cash driven value chains can limit digital payments both for the merchant and the customer.

- **Supply chain digitization for merchants**

Despite QR codes placed at POS, certain merchants prefer to accept cash from customers, majorly because the merchant’s supplier or vendor payments are cash driven. Digitizing the end-to-end supply chain would drive merchants to make supplier or vendor payments digitally; furthermore, driving digital payment acceptance from customers at POS.

Herein ONDC (Open Network for Digital Commerce) will help enable democratization of small merchant digitization. ONDC aims to provide an open network for all aspects of digital trade which will promote digital inclusion among small merchants and democratize digital commerce with standardized

operations and logistical efficiencies. Merchant onboarding to ecommerce and accepting digital payments will become seamless and cost-effective by removing the need to work with multiple platforms, as seen in [Exhibit 11](#).

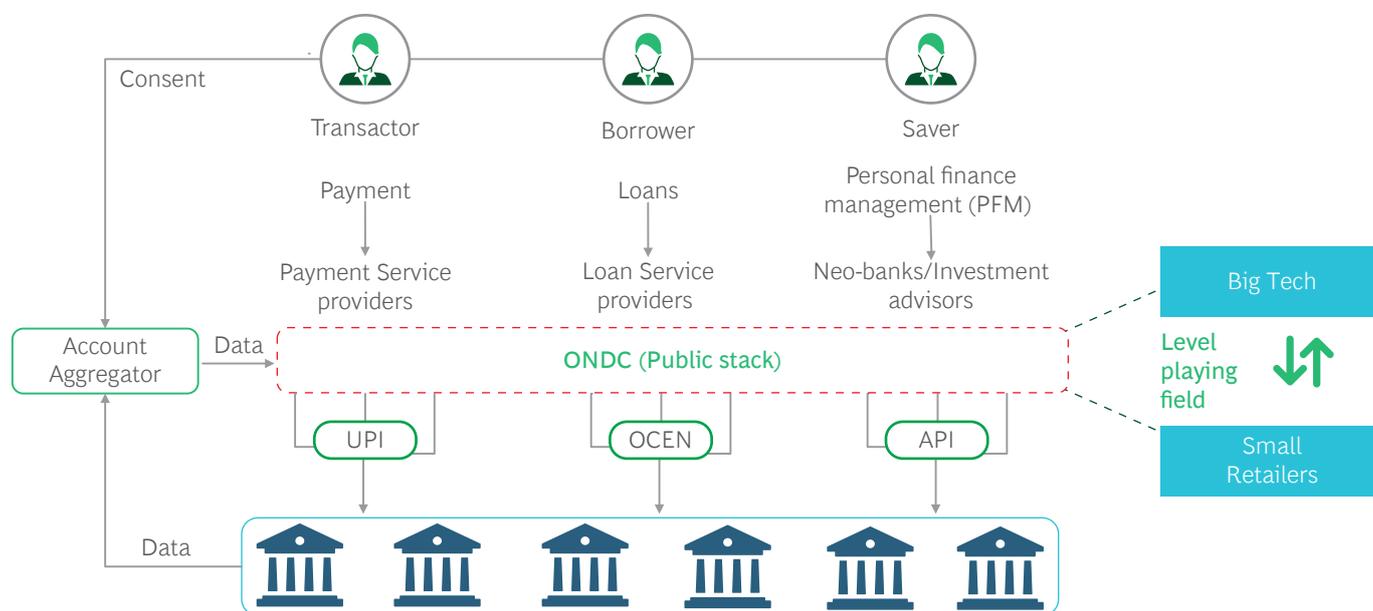
Moreover, online merchants could benefit from potentially lower merchant discount rates with competitiveness induced by the open network. Furthermore, this will enable merchants to build credit histories and reduce customer acquisition costs by gaining access to users over a single platform.

Additionally, support from the government in the form of incentives to seller platforms and/or the underlying payment gateways would be crucial, as this would drive platforms to offer low-cost payment services to smaller merchants. This would be similar to UPI where the government has announced incentives for financial institutions to potentially make up for some of the lost revenues due to zero MDR in UPI merchant payments.

- **Digitization of customer at last mile**

Limited avenues to spend digitally discourages customers from adopting digital payments, especially in digitally underpenetrated areas. It would be imperative to digitize customers’ daily lives, thus

Exhibit 11 - ONDC to Boost Small Merchant Digitization and E-commerce Scale



Source: BCG analysis.

creating an ecosystem where the customer could spend digitally for every activity.

As evident in toll collections across India, the launch of FASTag—a Radio Frequency Identification (RFID) technology linked electronic toll collection system—accelerated digital collections of toll payments, significantly reducing cash handling.

Since the launch of FASTag in 2017, aided by a mandate from the Ministry of Road Transport & Highways (MoRTH) for all vehicles to use FASTag, about 49 million tags have been issued processing more than 2.4 billion transactions in FY22. This is already playing a critical role in digitizing payments in the mobility sector and contributing to a broad-based growth of digital payments in the country.

Another recent example is the traction seen by BBPS offering an interoperable and accessible bill payment service to millions of customers enabling multiple modes of payment while providing instant payment confirmation.

Similar digitization could be applied to other sectors such as e-commerce in rural areas offering last-mile deliveries, pick up and drop services. This could be extended to deliveries of essential medicines with on-demand video and audio doctor consultations in local languages. Furthermore, aggregating agri-services such as on-demand labor for harvesting, farm equipment rentals, warehouse space for storage would spur the digitization of rural and agri-focused customers.

IoT, 5G and CBDC lending further impetus

Next generation payment methods such as M-to-M (machine to machine) will be enabled by 5G and IoT, driving seamless payment experience and embedding digital payments as part of daily routine. Additionally, the launch of Digital Rupee, a CBDC (Central Bank Digital Currency) in India, could help in addressing few pain points such as security concerns over digital payments, transparency and traceability of transactions.

• Emergence of M-to-M payments

Embedded payments allow making purchases and completing transactions to be an invisible and non-time-consuming part of any activity, thus reducing time, effort, and manual interventions required today to initiate, authenticate, and complete a transaction.

The most compelling case for IoT enabled payments is in the B2B (business to business) payments space, where payments will increasingly become embedded into core activities. Supply chain activities such as inventory management, including restocking and reordering that were earlier fragmented, will converge into one functionality with embedded payments solutions to facilitate transactions. For example, 5G enabled smart vending machines placed at malls or airports would sense the items that need to be reordered and issue a restocking order. On completion, the smart machine would initiate the payment on behalf of the company.

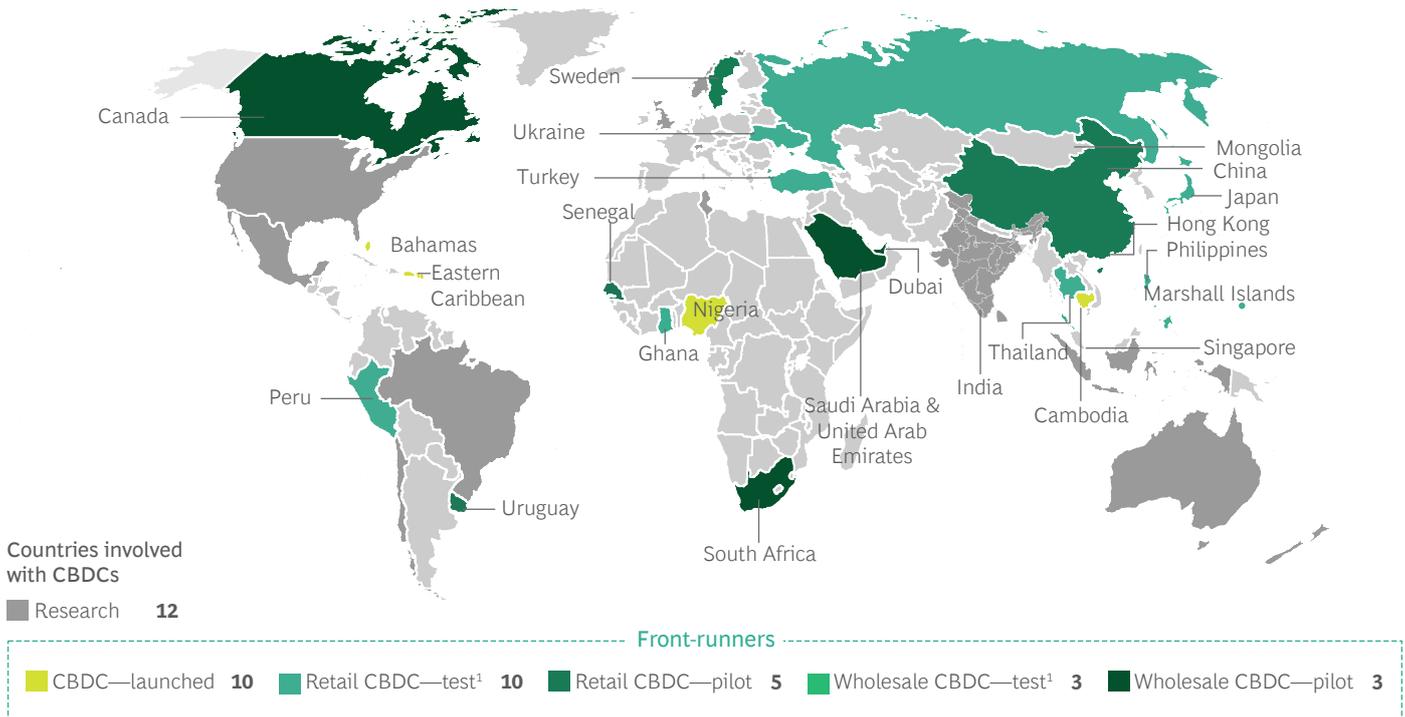
• Launch of Digital Rupee

Digital currencies have become increasingly popular in the past decade and India is joining the global push now with the proposed launch of the Digital Rupee. More than 40 countries have already researched CBDCs (Central Bank Digital Currency), as seen in [Exhibit 12](#), on account of two reasons: driving real-time settlements, and improving transparency.

The Digital Rupee that the RBI is expected to introduce will enable real-time settlement across use cases. Real-time settlement would significantly improve cross-border transactions by minimizing foreign exchange risk and augment B2B payments by minimizing counter party risks as potential for payment default and fraud would decrease. There could also be reduced settlement risk due to use of blockchain technology in CBDCs.

Additionally, the traceability and transparency linked with CBDC transactions could aid in improving reversal and refund processes, which currently are primarily manual and time consuming, thus hampering user experience and trust.

Exhibit 12 - Emerging Markets are the Front-runners in CBDC Development



Source: CDBC Tracker, Press articles, central bank reports, BCG analysis.

Note: Eurozone assessed as one entity

¹ Proof of concept

Chapter 3:

Embedded payments to embedded finance



Embedded payments to embedded finance

Today, we are observing a paradigm shift towards embedded finance as digital payments become ubiquitous in the Indian economy.

Digital payments fueling embedded finance

A seamless payment journey embedded across e-commerce has become an obvious outcome of increased participation and engagement in digital payments with several benefits to users and merchants. This has led to not only payments enabling financial services (embedded payments) such as UPI enabling equity and mutual fund investments but also, progression from embedded payments to embedded finance with the advent of BNPL where financing is embedded during the payment stage at check-out.

• Seamless payments journey in investment sphere

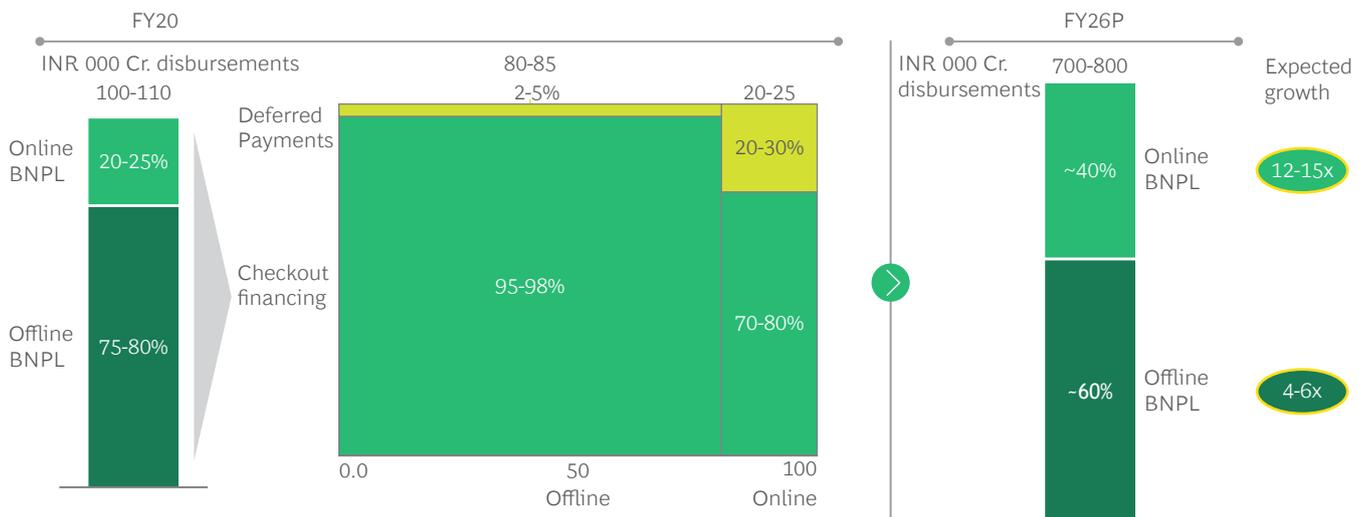
Equity and mutual fund investments have seen rapid growth in FY21. There are about 73 million demat accounts currently active, more than doubling from 36 million three years ago. Simultaneously, the equity market has witnessed more than 8x jump in retail investor base from 12 million four years ago to about 100 million investors today. However, despite this growth, the Indian population is still underpenetrated. Only 7-8% of the population participates in the stock market, which is significantly low compared with

countries like the USA (55%) and the UK (33%). Currency and deposits dominate the savings space in India, but equity and mutual funds are expected to grow and capture 25% of savings by 2025.

The UPI-based autopay today facilitates Systematic Investment Plan (SIP) from payment platforms and offers three primary benefits. First, there is increased awareness through active promotion by TPAPs. Second, autopay offers greater convenience, ensuring on-time payment of SIPs without intervention and helps avoid late fees. Third, it allows the customer to customize their investment choices and determine the frequency and amount for each mandate based on the requirement. The total mandates executed via UPI have increased by 5x just in the last 6 months, reaching approximately 32 million mandate transactions in March 2022⁸.

Similarly, the UPI IPO mandates have lent impetus to investment growth in India. The IPO mandate executed via UPI has jumped 3x just in the last 6 months of 2021. Top 5 remitter banks have seen 30-70% growth in their IPO volumes processed through UPI. This can be primarily attributed to UPI attracting a wider demographic that is not necessarily limited by net banking access. It has simplified the process for enabling prospective investors through existing mobile applications. TPAPs provide an additional boost as they are incentivized by companies to promote subscriptions.

Exhibit 13 - BNPL Market Dominated by Checkout Financing, Online is New Growing Segment



Online refers to all eCommerce deferred payments and EMI transactions; Offline refers to Brick and Mortar POS financing (e.g., Pine Labs) and paper financing (e.g., Bajaj Finance)

Source: Expert discussions, Motilal Oswal, Macquarie Report, BCG analysis.

Note: P=projected

⁸ Total mandate execution transactions include bill payments, subscriptions, mutual funds, SIPs among others

- **Integration of payments and lending with advent of BNPL**

As the payment space continues to grow, increased interest and funding in platforms is expected to overshadow valuation profiles of digital payment platforms as noted by BCG at FIBAC 2021⁹.

Buy-now-pay-later, or BNPL, enabling deferred payments has emerged as the intersection of payments and lending demonstrating immense potential, and is expected to grow at 35-40% over the next 5 years led by rapid growth in consumerism and online spending, shifting preference of GenZ and millennials buying on credit due to the simple and fast customer journey, apart from the low, less than 5%, credit card penetration in India. As customers shift their focus from savings to consumption, the addressable market for BNPL is large and growing fast. There will be a rapid rise of ecosystems where credit will get embedded within the digital payments journey. For example, ride hailing company Ola in India has introduced postpaid pay later option to keep its customers captive on the platform.

In India, two broad BNPL variants are popular: deferred payments and check-out financing (EMI). The BNPL market is currently dominated by offline BNPL through check-out financing, which has captured 95-98% of the offline BNPL market, as in [Exhibit 13](#). It also holds relatively higher ticket spending (usually in EdTech, electronics, travel, etc.), and the credit limit is anywhere between US\$65 and US\$1,300¹⁰. Deferred payments have smaller high-velocity tickets (usually in food delivery), and the credit limit is usually lower than US\$130. Online BNPL services represent only 20-25% today of total BNPL gross merchandise value, although it is expected to become the new growth segment holding 40% of the market by FY26.

BNPL has gained popularity among both merchants and customers. This integrated BNPL model has expanded the value accruing for merchants through increased customer conversion and higher average order value.

Enabling greater access to merchant credit

Globally, there has been a seismic shift by financial institutions in the way they leverage massive payment and transaction data for new generation credit assessment. Greater access to credit will drive further formalization of the economy and kickstart a virtuous cycle of credit availability, where a digital trail created by digital payments will enable access to credit empowering the merchant to invest in business opportunities, thus driving potentially higher earnings, which could further create wider access to credit for the merchant. Additionally, transparency due to digital payments could enhance tax compliance and GST collections.

- **Credit worthiness increasingly dependent on payments data**

The relative weightage of transaction data in credit assessment has changed from ~10% to ~50% due to transaction data facilitating granular analytics-based insights into purchases and cash flows, as seen in [Exhibit 14](#). The new generation digital assessment of credit worthiness of merchants using transaction data will become increasingly relevant with growth in P2M payment digitization.

- **Fintechs better poised to meet the unmet lending demand**

Financial institutions in India are increasingly looking to adopt transaction data driven credit assessment. This would generate access to credit to merchants that were historically excluded from lending services as more and more transactions migrate to digital payment methods. The unmet demand in MSME lending today is estimated at about 35-40% of total lending potential amounting to US\$250-260 billion¹¹. Earlier payments and financing were majorly bank led, however, currently more than 90% of UPI digital transaction volumes are led by TPAPs. The lending trajectory is expected to follow a similar trend where financing services would be driven by fintechs by utilizing payments data. Hence, incumbent lenders, the traditional banks would need to innovate their offerings to attract and retain these customers.

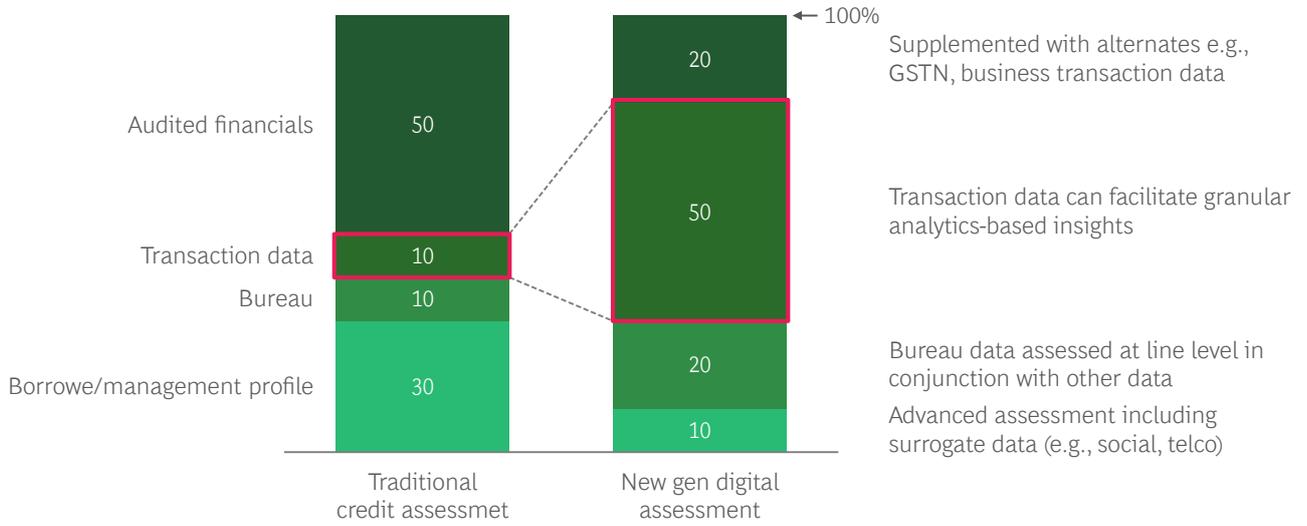
⁹ Annual banking conference held on December 22-23, 2021; BCG in continued association with Federation of Indian Chambers of Commerce and Industry (FICCI) and Indian Banks' Association (IBA)

¹⁰ Exchange rate INR: USD = 75

¹¹ IFC Financing to Micro, Small and Medium Enterprises; Numbers for have been projected based on FY21 data

Exhibit 14 - Primary Sources of Credit Insight Beginning to Change

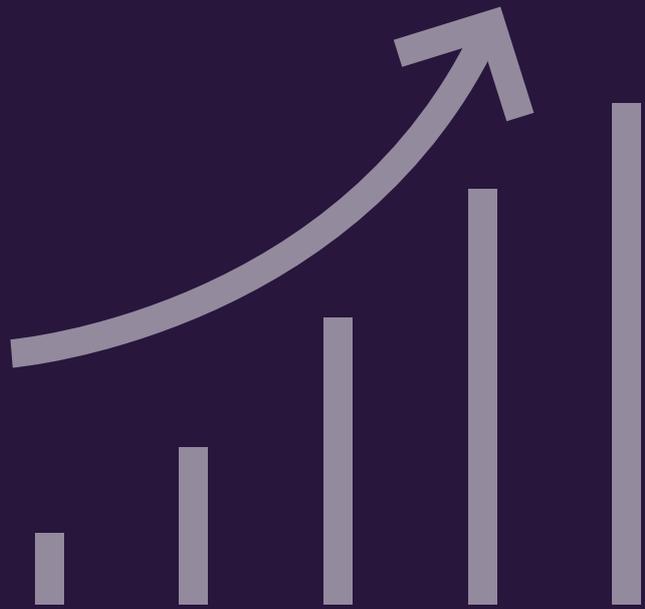
Relative weight of metrics in credit assessment



Source: BCG case experience, expert interviews.

Chapter 4:

Providers expanding beyond payments



Providers expanding beyond payments

Payments players are increasingly looking beyond traditional payments to not only offer high margin services but also make the most of lucrative commercial outcomes of the unprecedented digital payment growth in India.

Beyond highly competitive market and regulatory pressure forcing low transaction charges, there are four other drivers behind the emergence of super apps.

- 1 Payments apps are increasingly becoming an attractive solution for mobile-first customers who do not prefer using multiple apps
- 2 An integrated super app ensures rich customer behavior data through one application that helps payments players offer hyper-personalized services

3 With a super app, merchants only need to integrate with one app to access a large customer base of highly engaged users on a single platform

4 Potential rationalization of customer acquisition cost for payments players by offering new services to existing captive user base

Owning the customer with a “super” app

Globally, super apps have evolved over time from different starting positions and now include entire ecosystems, as seen in Exhibit 15. For example, Alipay started off as an e-wallet and now includes ridesharing, travel, messaging, banking & insurance, food and groceries, and e-commerce services.

Similarly, in Indonesia, Gojek evolved as a ridesharing platform and now offers a suite of services, including e-wallet, travel, banking & insurance, food and grocery delivery, e-commerce, and loyalty.

Exhibit 15 - Super Apps have Evolved from Different Starting Positions to Develop Entire Eco-system

Geo	App	Ride Sharing	Travel	Messaging	E-Wallet	Banking & Insurance	Food	E-Comm	Grocery Delivery	Loyalty
	WeChat	✓	✓	Starting Point	✓	✓	✓	✓		
China	Alipay	✓	✓	✓	Starting Point	✓	✓	✓	✓	
	Meituan	✓	Starting Point		✓	✓	✓	✓	✓	✓
South East Asia	Grab	Starting Point	✓	✓	✓	✓	✓	✓	✓	
	Gojek	Starting Point	✓		✓	✓	✓	✓	✓	✓
	Ovo				✓	✓				Starting Point

✓ Core-Offering
 ✓ MiniApp
 Starting Point

Source: App Annie, Statista.

Moreover, globally, fintech firms such as financial advisory, loans and lending platforms, digital payments and investment platforms have seen highest investor interest, receiving a lifetime investment of US\$84 billion, as seen in [Exhibit 16](#).

Use cases beyond payments such as lending platforms, investment platforms and financial advisory services have seen high acceptance and growing investor interest as depicted in [Exhibit 17](#) (clusters seeing high investment amount and events) and could be prioritised by payments players as they look to move beyond payments.

Harness the power of data with personalized offerings

A prominent lever in the growth of the digital payment landscape has been the network effect, as showcased by UPI. The number of registered UPI users grew by >10x from 20-25 million in FY19 to 250-300 million in FY22, driving more than 100% YoY growth in transaction volumes since FY19. This network effect is expected to amplify going forward as a greater number of users board platforms such as UPI. This would be enabled by curated customer journeys and hyper-personalized offerings that monetize data.

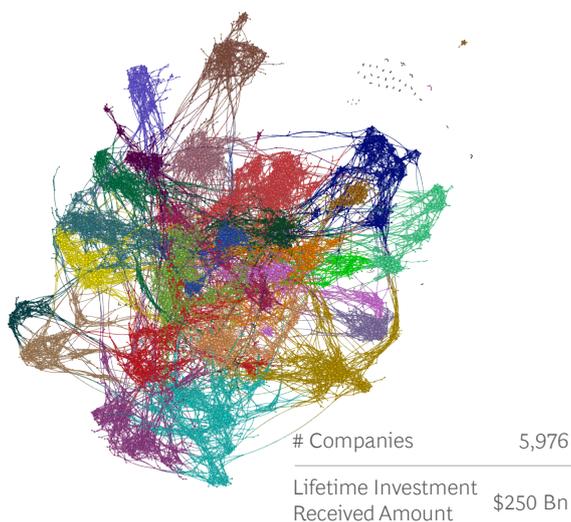
• Customer journey curation

TPAPs and wallets are increasingly curating customer journeys to ensure customer stickiness to digital payments. Customer stickiness is driven by taking users through a set of different use cases to develop a habit and ensure user transitions from low spend, low frequency to high spend, high frequency segment. The customer acquisition and engagement journeys are specially curated to pursue this objective, with gamification of payments and prompts.

• Hyper-personalized offerings

Hyper-personalization of user journeys and experiences is an important driver of retention and engagement, wherein rich payments data is analyzed at a segment of one to provide hyper-personalized services at the individual customer level. Hyper-personalized data drives payments players to provide users with targeted services, offers, and deals, which in turn can encourage users to rely on the app for other services instead of limiting themselves to just payments.

Exhibit 16 - Within Fintech Space, Financial Advisory, Loans & Lending Platforms and Digital Payment Platforms have seen Highest Investor Interest



	#Investment Events ¹	\$Inv. Amt. (Bn USD) ²	#Companies
Loans & Lending Platforms	943	19.2	344
Banking Services & Financial Advisory	864	23.9	444
Digital Payment Platforms	807	16	331
Investment Banking & Trading Platforms	595	25	299
Industrial Automation & Security Solution	550	10.2	351
E-commerce Platforms	522	7.7	214
Online Marketplace & Retail Platforms	544	20	226
Insurance & Healthcare Platforms	423	13.9	195
Online Food Order & Delivery Platforms	403	16.9	150
Property Insurance & Reinsurance Services	114	44.5	67

Each node is a company | Colored by clusters | Sized by degree of relevance

Source: Quid, Preqin, BCG Center for Growth & Innovation Analytics.

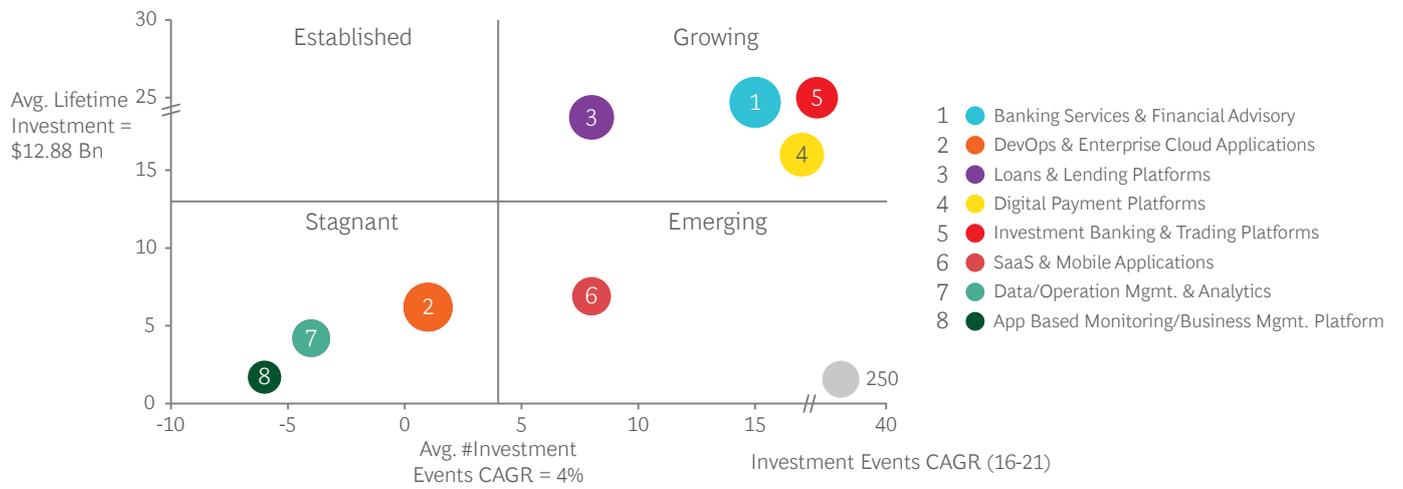
Note: ~6K companies related to 'Information Technology' and 'Financial & Insurance Services' from emerging economies were considered for the analysis. Companies were allowed to cluster based on (Business Descriptions) i.e., similar products, technology, customers, service offerings etc. Quid OPUS Analysis using PE & VC investment data from Preqin.

¹ Lifetime Investment Events.

² Lifetime Investment Amounts (\$Bn USD).

Exhibit 17 - Beyond Core Payments, Banking Services/ Financial Advisory, Investment Mgmt. and Lending "Growing" Investment Clusters

Lifetime Investment Amount (\$Bn)



Source: Quid, Preqin, BCG Center for Growth & Innovation Analytics.

Note: ~6k companies related to 'Information Technology' and 'Financial & Insurance Services' were considered for the analysis. neighbors of Digital Payments were considered for deep dive. Quid OPUS Analysis using data from Preqin. Investment Amounts includes all types of investments (PI, M&A etc.).

Chapter 5:

Continued push and support required



Continued push and support required

In what is an extremely dynamic Indian digital payments space, driving digital payments growth and innovative business models would require support and investments from both the authorities (Government and RBI included) and the payments players. We have identified five enablers crucial to spur growth of digital payments:

- 1 Simplify onboarding with CKYC
- 2 Build customer trust and awareness
- 3 Allow sustainable economics for facilitators
- 4 Reduce strain on bank infrastructure
- 5 Strengthen national digital infrastructure

Simplify onboarding with CKYC

Currently, KYC is one of the key bottlenecks discouraging merchants and customers from signing up for digital platforms and e-wallets. While digital KYC means of OKYC, VKYC are enabled for many players, they still come with friction when it comes to end digital KYC. Full KYC requires either a video call or a physical touch point with a biometric device.

CKYC (Central KYC) can be instrumental to overcome this hurdle. The KYC of the customer would be done through KYC documents verified and stored in the CKYC registry, a centralized repository of KYC records, following uniform standards. Thus, the customer would need to complete KYC only once to interact with various financial institutions.

Although RBI has introduced CKYC to simplify onboarding, the adoption of CKYC has been limited by a couple of challenges. First, the lack of awareness among users and the lack of training of on-ground staff that educates these users. Secondly, CKYC not being accessible to non-banking institutions, thus limiting the benefits to only a few ecosystem players.

To enable digital payments to scale rapidly, non-banking players such as PPIs, insurance and investment firms could also be allowed to access central KYC for seamless customer onboarding and minimize customer inertia.

Build customer trust and awareness

Data privacy and transparency are at the core of modern-day communication. It is necessary to educate users about the data collected and their ability to manage the same. To promote transparency, financial institutions and payments players, complemented by the necessary regulatory support, should look to provide consumers with an accessible and transparent platform that allows them to give, withdraw, review, and manage their consent at any time.

Customer education and awareness through meaningful methods can reduce potential fraud. Cyber threats are rising exponentially and as a result spending on cybersecurity has also increased. Today, Indian banks spend anywhere between 0.07% and 0.4% of their annual revenue on cybersecurity, compared to global benchmark of 0.5%. Thus, there is likelihood of higher cybersecurity spending by Indian banks in the future¹².

Social engineering along with lack of payment flow awareness leads to frauds such as collect call/account takeover and identity theft. There is an urgent need to spread awareness about fraud mitigation and financial safety practices to drive trust and reduce digital hesitancy among consumers. It is necessary to take proactive measures to mitigate fraudulent initiatives, such as the RBI introducing mandatory specific card tokenization across all major card networks, increasing safety as actual card details are not shared with the merchant. Other measures that can be taken include:

- Real-time tracking of transactions with automated decisions and blocking fraudulent transactions when identified
- Ensuring customer education and awareness through meaningful SMS and emails sent at regular intervals to mitigate customer vulnerability
- Integration of fraud reporting onto the platform as well as tools that provide users and managers with insights that improve the robustness of existing models
- Introduction of multifactor authentication (MFA) with integrated biometrics to ensure the user account is not hacked or used by others without user consent
- Introduction of default transaction limits for new users so that minimum velocity controls can reduce the damage caused to an individual

¹² Cyber spends include total spends by bank to get protection from cyber crimes such as phishing, stalking, spamming, spoofing, hacking, ransomware attacks, and other physical and digital frauds that compel individual banks to secure their network and servers

Customer research conducted by PhonePe shows that such measures can lower cybersecurity threats and go a long way in ensuring that customers trust financial institutions more. Moreover, ensuring ethical use of data and preventing the possibility of abuse of information will aid in building customer trust.

With increased trust and transparency, usage of digital payment services will also increase.

Allow sustainable economics for facilitators

Payment facilitators so far have pricing models that enable revenue generation across use cases, albeit with thin margins. While revenue potential exists in merchant payments through wallets, debit and credit cards, except RuPay, the commercials for UPI merchant payments have largely been immobilized because of zero MDR, to drive adoption.

Incentives for financial institutions through sustainable MDR would be critical to encourage them to drive merchant acquisition and engagement and digital payments growth. A sustainable MDR is crucial to this pursuit.

Introducing an MDR of 0.2-0.3% of the transaction value for small tickets can allow banks, payment

players and the overall ecosystem to run sustainable businesses.

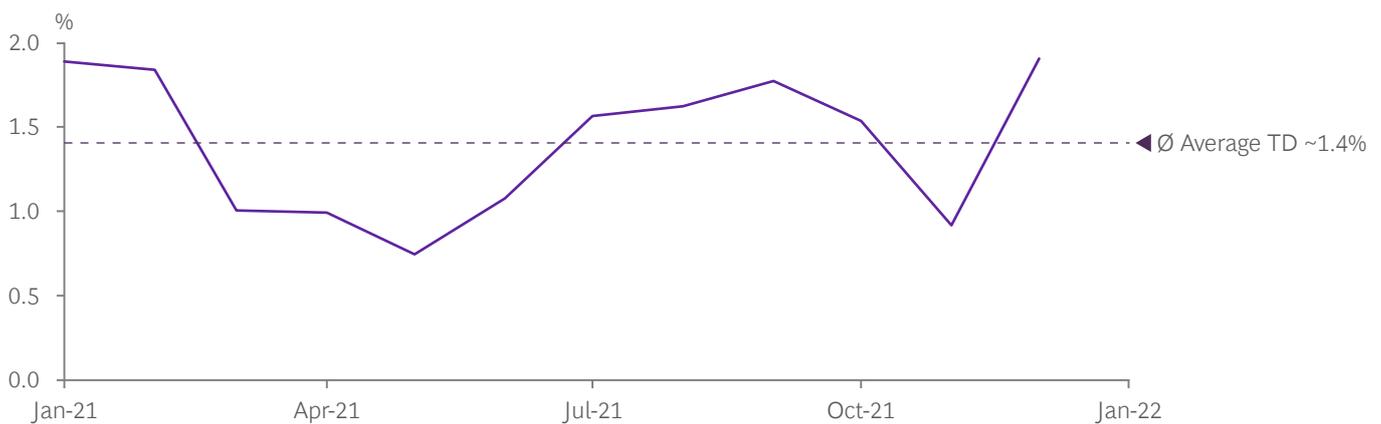
Considering 200-220 average transactions per merchant per month, INR 300 average ticket size, INR 500-600 merchant acquisition cost, the MDR needed to cover acquiring cost over a 6-month period would be 0.1-0.2%. Considering an additional 0.1-0.15% interchange, we believe that an MDR in the range of 0.2-0.3% may be useful in building a sustainable business. For a merchant with average monthly digital sales of INR 60,000, the MDR would amount to a small amount of INR 120-180 every month.

Reduce strain on bank infrastructure

Exponential rise in digital transactions are increasing pressure on bank systems. The inability of some banks to handle demand spikes is a key reason for UPI transaction failures. On average, banks and NPCI face about 1.4% of technical declines in UPI transaction volumes, as seen in Exhibit 18, due to unavailability of systems and network issues given the unprecedented UPI growth. Banking platforms have limited scalability and room to improve on service quality. Banks need to solve for this by evaluating options outside core banking including cloud.

Exhibit 18 - Weighted average technical decline (TD) as a % of total UPI transaction volumes at banks and NPCI

Weighted average technical decline (TD) of UPI transaction volumes at banks and NPCI



Source: NPCI, BCG analysis.

It is possible to promote the migration to cloud infrastructure by incentivizing infrastructure upgrades. Service quality can be improved by reducing core system interactions such as by managing transactions outside the core system and marking net ledger entries at the end of the day. Thereafter, authorities can also ask banks to adopt transaction success rate thresholds.

Moreover, UPI Lite which will allow offline debit for small-value payments primarily less than INR 100 will hit core banking in batch mode and not real time, thus reducing core banking interactions for banks.

Strengthen national digital infrastructure

Enabling low-cost and stable internet access to all would be key to unlock digital payments potential in many

underpenetrated regions. It would be imperative to ensure successful transactions, driving trust in digital payments and enhanced customer experience.

However, the high-speed enabled by the 5G network would also be crucial to bring to reality few of the hyper-personalized, embedded payment solutions such as payment acceptance deployed onto customer handsets with cloud-based solutions, voice and sound enabled payments and merchant interactions. Moreover, effective and timely fraud monitoring and prevention would also be enabled by 5G speed.

Although the rapid transformation to 5G enabled high-speed and embedded transactions ecosystem will need to be done in a secure manner, ensuring customer and merchant trust at every step of the journey.



Glossary

BBPS: Bharat Bill Pay System, developed by NPCI, is a centralized platform integrating billers, aggregators, and financial institutions facilitating bill payments

BNPL: Buy-now-pay-later enables deferred payments and/or checkout financing for online and offline payments

CBDC: Central Bank Digital Currency is digital form of fiat currency issued by the Central Bank

CKYC: Central KYC is completing customer KYC using the documents that are verified and stored in a CKYC registry, a centralized repository of KYC records, following uniform standards

FASTag: A Radio Frequency Identification (RFID) technology linked electronic toll collection system developed by NETC

IMPS: Immediate Payment Service, developed by NPCI, is an interbank electronic fund transfer system that allows real time fund transfer from one bank account to another

IoT: Internet of Things is when physical objects embedded with sensors and other technology interact and transfer data between each other over the internet

IPO: Initial Public Offering is when a private corporation offers its shares to the public in a new stock issuance

MDR: Merchant Discount Rate is the fee paid by merchant to the acquiring financial institution

MFA: Multi-factor authentication is when the user provides two or more verification evidence to access resources

M-to-M: Machine-to-machine payments is when smart internet enabled devices drive automated payments

NETC: National Electronic Toll Collection, developed by NPCI, is an interoperable toll payment collection and clearing solution

NPCI: Umbrella organization operating retail payments and settlement systems in India; an initiative of Reserve Bank of India (RBI) and Indian Banks' Association (IBA)

ONDC: Open Network for Digital Commerce is an open network model providing open source standards for E-commerce; similar to UPI in payments

POS: Point of Sale is where the customer pays the merchant at the checkout counter

PPI: Pre-paid instrument facilitating payments against value stored on the instrument

SIP: Systematic Investment Plans that allow consumers to invest in a pre-determined and periodic format, typically into mutual funds

TPAP: Third Party Application Providers participating in UPI via payment service provider banks. E.g., PhonePe, Gpay



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