



Impact of DIGIDHAN Mission on India's digital payments ecosystem

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Foreword

The Government of India launched the Digital India programme with the vision of transforming India into a digitally empowered society and a knowledge-based economy, by ensuring digital access, digital inclusion and digital empowerment while bridging the digital divide.

The DigiDhan Mission was set up under the Ministry of Electronics and Information Technology (MeitY) with the objective of promoting a less cash economy and to facilitate seamless digital payment experience for all citizens in June 2017.

Under the DIGIDHAN Mission, the payment ecosystem in India witnessed several innovative initiatives such as a Digital Payments Dashboard for reporting and monitoring of digital transactions; digital payment awareness and capacity-building initiatives; digital payments incentive schemes etc. MeitY worked collaboratively with several ecosystem players such as NPCI, Banks, FinTechs, and other Ministries, to ensure increased awareness, access, and adoption of digital payments by all types of user segments.

The six-year journey of the DIGIDHAN Mission has propelled the growth of digital payments significantly. It has contributed to sustainable user habit formation for digital payments by building customer-centric use cases such as payments through UPI123 for feature phone users, toll tax payments through FASTag, DBT payments through AePS, or bill payments through BBPS. The Mission has allowed convenience, saving of time and cost for consumers, more transparency, and less leakages for the government.

With the large reach of the DIGIDHAN Mission, I am pleased to share the 'Impact of DIGIDHAN Mission on India's Digital Payments Ecosystem' – an assessment report co-developed by MicroSave Consulting (MSC). It covers mission's impact at the user, merchant, and ecosystem levels and analyzes the growth in payment systems so far. The report also highlights the way forward by noting the challenges to scale up and ensuring a strong and secure payment ecosystem.

Place: New Delhi

Dated: 12.02.2024

(S. Krishnan)





Preface

The implementation of the Digital India Programme since July 2015 resulted in the creation of a robust digital public infrastructure and enabled provision of digital services to the citizens. The promotion of digital transactions particularly digital payments was a natural extension of the Digital India Programme. The promotion of digital payments was envisaged as a major means of financial inclusion and formalization of the Indian economy. Accordingly, the Government had launched the DigiDhan Mission in June 2017 for promoting and overseeing the establishment, growth and sustenance of a robust, secure and inclusive National digital payments ecosystem.

Several initiatives were initiated by the Government under the DigiDhan Mission including setting digital payments transaction targets to banks, expansion of the payment infrastructure, development of the Bharat Bill Payment System, National Electronic Toll Collection programme, development of new digital payment modes, awareness campaigns across the country, improving digital & computer literacy through PMGDisha, implementation of incentive schemes for banks & fintechs. As a result of these measures, digital transaction volume increased exponentially from 2,071 crore in 2017-18 to 13,462 crore in 2022-23. For the current financial year till 31.1.2024, already 14,888 crore transactions were recorded.

After implementing the Mission for 6 years, it was felt necessary to initiate an assessment study to understand the impact of the DigiDhan Mission on various stakeholders including customers, merchants and overall economy. Accordingly, the current study was assigned to MicroSave Consulting (MSC). This study report covers the growth of digital payments in India, how digital payments have impacted the users, way forward in addressing challenges and further promoting the journey toward a formal & less-cash economy.

Place: New Delhi

Dated: 12.02.2024

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Executive summary

The retail digital payment sector has shown a remarkable surge and has grown at a CAGR of 50.84%¹ in transaction volume from 2017 to 2023. It covers retail credit transfers, debit transfers and direct debits, PPI and card payments, as per RBI data. India clocked ~368.82 million² daily digital transactions in FY 2022–2023. The country surpassed 100 billion (116.6 billion) digital transactions in FY23-24 as of 11th December 2023.³ Many factors have contributed to this growth—the key among these are advancements in the payments infrastructure, breakthroughs in information and communications technology, and the implementation of a dynamic regulatory framework. The Government of India showcased its commitment to promoting financial inclusion and improving digital payments.

India's digital payments journey gained significant momentum when the RBI established the National Payments Corporation of India (NPCI) in 2008. The NPCI introduced pivotal products, such as IMPS, RuPay, and, notably, UPI in 2016. The introduction of the India Stack in 2010 significantly expanded the reach of financial services in the economy. The Digital India campaign further bolstered this transformation through a focus on digital infrastructure, governance, and citizen empowerment. However, several challenges acted as barriers to the growth of digital payments—digital literacy and financial literacy among the population were still low, digital payments were largely limited to card payments while UPI was still picking up, acceptance infrastructure was limited, and MDR on card payments served as another deterrent.

Hence, the Government of India decided to support digital payments under a mission mode and launched the DIGIDHAN Mission in 2017 with the Ministry of Electronics and Information Technology (MeitY). It seeks to promote and oversee the establishment, growth, and sustenance of a robust, secure, and inclusive national digital payments ecosystem.

The Mission undertook several initiatives. It set digital payment transaction targets for banks, expanded the payment infrastructure, developed the Bharat Bill Payment System and the National Electronic Toll Collection program, developed new digital payment modes, conducted awareness campaigns across the country, improved digital and computer literacy through PMGDISHA, and implemented incentive programs for banks and FinTechs.

The Mission launched a comprehensive DIGIDHAN dashboard, promotional and educational campaigns, such as DIGIDHAN *Melas* and DigiVAARTA, an artificial intelligence-driven platform for multi-lingual support—*Bhashini*, and several incentive programs for users and merchants. The introduction of UPI 123Pay expanded digital payment access to feature phone users and underscored the Mission's inclusive approach. With such vast scale and multi-sector involvement, the DIGIDHAN Mission emerged as an enabler for the growth of digital payments in the country. Hence, it is imperative to understand the DIGIDHAN Mission's impact on the ecosystem.

This report highlights the impact of the DIGIDHAN Mission and the growth of the digital payments sector on India's ecosystem. It looks at the country's digital payments journey, major events that contributed to this journey, the various programs and initiatives along the way, and the impact on users' quality of life. It also covers the key drivers for users to onboard on the digital payments ecosystem and persisting barriers. Based on these, the report highlights the opportunities various stakeholders can use to position India as a global leader in digital payments, and foster financial inclusion and economic growth.

The research framework and methodology

MeitY commissioned MSC (MicroSave Consulting) to assess the growth of digital payments and the impact of the DIGIDHAN Mission on the Indian ecosystem. MSC conducted informant interviews with 17 stakeholders to gauge their efforts to boost the usage and performance of the digital payments ecosystem. Stakeholders included government and allied bodies, regulators and policymakers, payments infrastructure providers, and FinTechs, among others on



the supply side. MSC also conducted qualitative (80) and quantitative research (2,100) with a nationally representative sample in nine states. The respondents included multiple user segments across various demographics and focused on rural locations, merchants, and female customers.

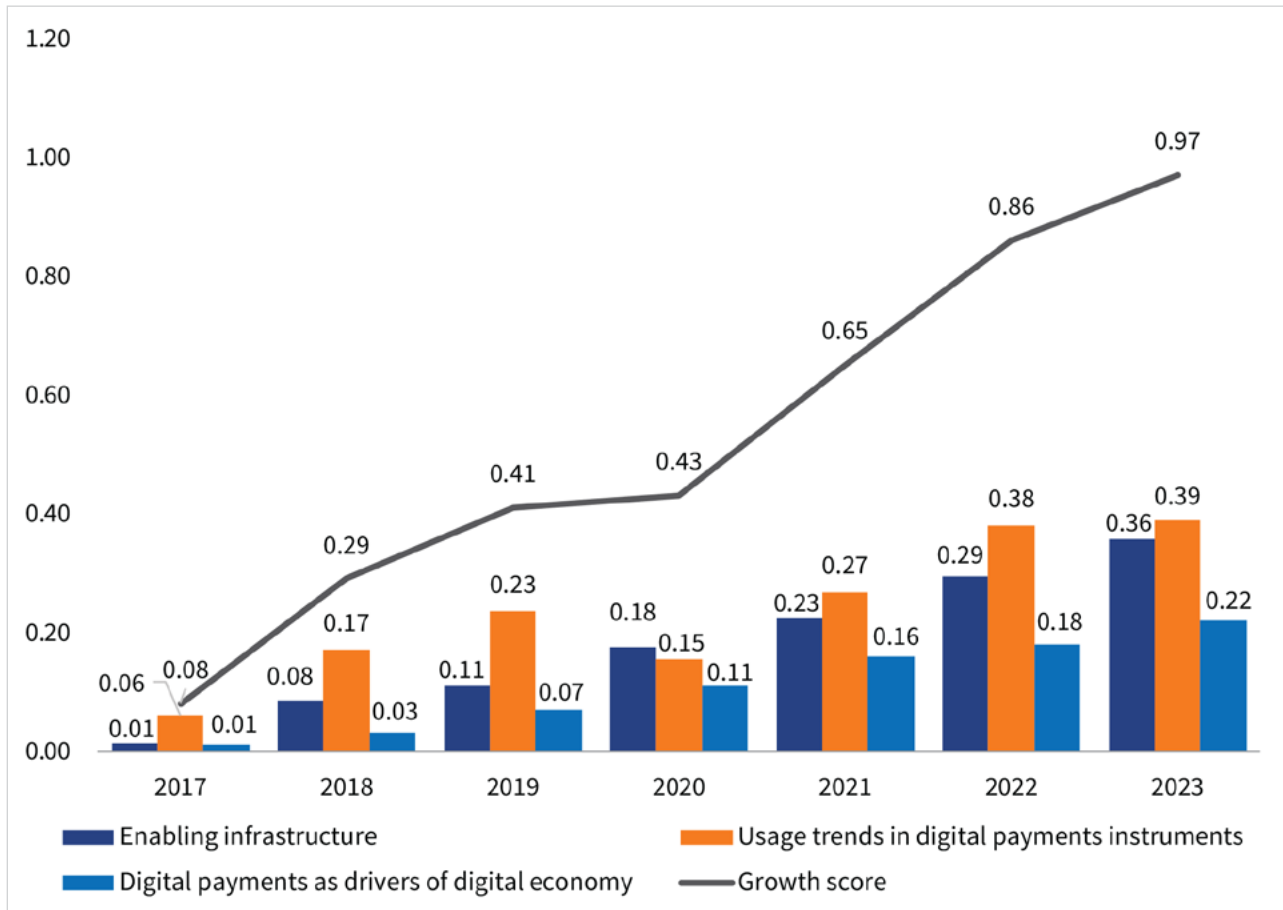


These parameters were amalgamated to build a framework that assesses the Mission's impact. The framework used two key inputs: i) Initiatives for digital payments done by government and private players and ii) Drivers for the uptake of digital payments. Both components contribute to the overall outcomes and are likely to increase digital payment adoption rates, a broader acceptance among merchants and users, and an enhanced user experience that encourages sustained digital payment usage. Hence, the impact of digital payments is assessed by analyzing: i) How the digital payments ecosystem has grown by developing the growth score and ii) How digital payments have impacted users' lives. Both these outputs form the overall impact of the DIGIDHAN Mission on the country's landscape.



How the digital payments ecosystem has grown

The growth in the digital payment ecosystem has been measured by building a growth score from three pillars: i) Enabling infrastructure, ii) Usage trends in digital payment instruments, and iii) Digital payments as the drivers of the digital economy. The growth score has been scaled between 0 and 1 (the minimum value being 0 and the maximum being 1). This scaled value is multiplied by each parameter's weight to get the desired score. **As per MSC analysis, India's digital payments ecosystem has grown 11 times between 2017 and 2023 after the DIGIDHAN Mission's launch.** It has exhibited a CAGR of 42% in these six years and highlighted the advancement of digital payments and their increasing influence in related sectors.



- The first pillar, **enabling infrastructure for digital payments**, which measured the countrywide adoption of the infrastructure to facilitate digital payment, has grown by 29 times between 2017 and 2023. It highlights the increase in infrastructure that facilitates digital payments, such as devices, *Aadhaar*, internet subscribers, and QR codes, which has significantly deepened digital payment adoption across India.
- The second pillar, **usage trends of digital payment instruments**, measured the uptake of various digital payment instruments. It has grown by 5.5 times from 2017 to 2023, which emphasizes the high customer preference for UPI payments, card usage, *Aadhaar* payments, and mobile wallets.
- The third pillar, **digital payments as a driver of the digital economy**, measured the growth in complementary sectors, such as savings, insurance, bill payments, and health indicators along with the growth in digital payments. It demonstrated the interplay of digital payments with economic growth through enhanced efficiency and expansion of services to underserved populations. This pillar grew by 17 times from 2017 to 2023.

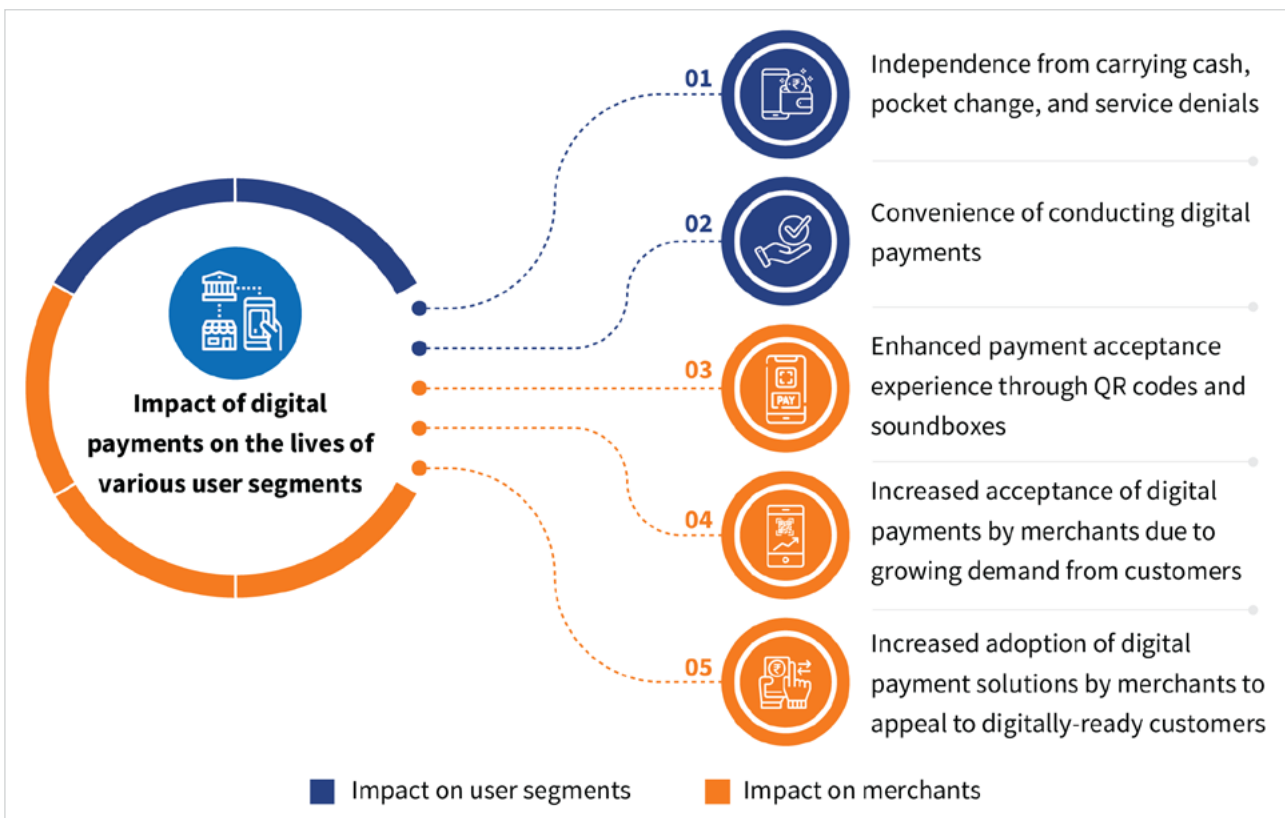


How digital payments have impacted the user's life

MSC's nationwide research has revealed that digital payments profoundly impact various user segments. Consumers have started to accept them with open arms, along with cash. As of December 2023, India boasts a digital payment user base of 300 million,⁴ which is 36% of the adult population. While much more needs to be done to include the remaining 64% of the Indian adults, the initiatives so far have been going in the right direction. The research looked at the digital payment user segments to arrive at the impact on their lives. As per the MSC study, 88% of user segments that are aware of digital payments actively use them for the efficiency, convenience, and freedom they offer. Similarly, about 85% of merchants in the study accepted digital payments, mostly through UPI QRs, followed by PoS machines.

- **Independence from carrying cash, pocket change, and service denials**

The study observed, a significant acceptance of digital payments as 94% of digital payment users appreciate the elimination of cash handling. Digital methods, such as UPI, PPI wallets, and debit and credit cards have notably improved the transaction experience by resolving the need for exact change, which has increased satisfaction for both customers and merchants. Notably, 95% of female digital payment users feel that digital modes have reduced their dependencies on other family members to withdraw cash for household expenses or make bill payments.



- **Enhanced user experience and convenience to conduct payment transactions**

The convenience of digital payments is underscored by user-friendly interfaces, inclusive experiences, and greater reliability due to reduced transaction failures. As per the study, 79% of digital payment users admire the ease and convenience digital payments bring over cash. Even rural areas have seen a sustainable shift toward digital payments, with 27% of digital payment users relying on digital models, such as UPI, PPI wallets, and cards, to handle most of their monthly expenses.

- **Enhanced payment acceptance experience through QR codes and sound boxes**



The integration of UPI QR codes and the introduction of QR sound boxes, used by 14 million⁵ merchants, have made payment processes more efficient and less dependent on manual monitoring. As per the MSC study, 94% of rural merchants who accept digital payments reported a significant improvement in their payment collection process. They now receive payments directly in their bank accounts, which has eliminated the need to deposit cash regularly in the bank branch.

- **Merchants have pivoted to accept digital payments due to demand from customers**

The simplicity of digital payments has propelled their adoption and increased customer demand to conduct digital transactions at offline retail outlets. Nearly nine out of 10 merchants who accept digital payments in the study revealed that their customers urged them to opt for card or QR code payments following the cash shortage at ATMs and bank branches post the demonetization in 2016. Even female merchants felt the need to accept digital payments, and 88% of them adopted UPI QR due to motivation from their customers.

- **Merchants have adopted digital payments to showcase savviness, inclusivity, and digital readiness**

Between demonetization and the onset of COVID-19, approximately 26% of the study's merchants adopted digital payments through cards and UPI. The remaining merchants cautiously observed the digital payments landscape and found that their customers gravitated toward competitors and other merchants that accepted digital payment methods. Hence, more merchants started to accept digital payments out of fear of losing business.

The PM SVANidhi program by MoHUA also accelerated street vendors' adoption of digital payments. As per the MSC study conducted for MoHUA, street vendors are estimated to conduct 3 billion digital transactions per month, out of which 20% are done by PM SVANidhi vendors.

Initiatives undertaken for digital payments

Under the DIGIDHAN Mission, many private and public players launched initiatives and programs that propelled the adoption of digital payments. These programs are bucketed into three focus areas—generate awareness, improve access, and increase usage.

- **Initiatives to generate awareness**

The low levels of financial literacy in India called for awareness generation initiatives by public and private players in the country. Many of these initiatives were led by MeitY, the Reserve Bank of India, the Ministry of Home Affairs, and private players, such as Google Pay, Paytm, and HDFC Bank.

MeitY⁶ undertook several initiatives that showed remarkable outcomes. “DigiShala,” a TV channel launched to educate rural and economically disadvantaged segments, has reached 20 million families with multilingual content since 2016. The PMGDisha program, introduced in 2016, successfully bridged the digital divide by training more than 63.5 million individuals out of 73.6 million enrollees, with an emphasis on digital payments. During the “Azadi ka Digital Mahotsav,” campaigns, such as “Digital Payments Utsav” and “Digital Payment Sandesh Yatra” were initiated. “DigiVAARTA,” which used the CDFI's *Samwad* platform since September 2018, has reached more than 12 million citizens to improve financial literacy. These efforts collectively contribute to India's push toward digital financial inclusion and the creation of a cash-light society.

- **Initiatives to improve the accessibility of digital payment products**

Several initiatives were launched to ensure the accessibility of digital payment products during the DIGIDHAN Mission. The RBI's Payment Infrastructure Development Fund (PIDF), established in June 2020, focused on deploying a mix of physical and digital payment solutions, notably PoS terminals and QR codes. By November 2023, 820,000 physical



and 271 million digital devices⁷ were deployed. Concurrently, initiatives, such as the “75 Villages Digital” program continue to support more than 150,000 villagers to boost digital payment literacy and infrastructure. Significant strides were made through the contributions of private players, such as Razorpay’s drive to digitize SME operations and HDFC Bank’s Offline Pay, which facilitates network-independent transactions. Furthermore, linking RuPay credit cards to UPI and the advent of “UPI 123Pay” for feature phone users have broadened digital payment access.

- **Initiatives to increase the usage of digital payment products**

The policy initiatives and technological advancements have catalyzed a marked shift toward digital payments in India and addressed consumer and merchant needs across varied sectors. The Zero-MDR initiative, launched in 2020, eliminated transaction charges for RuPay and UPI, and significantly increased PoS terminal deployments by 95% within a year. Efforts to digitize fuel transactions through cashback and loyalty programs have seen 40% of petrol pump payments⁸ go digital in 2022. Additionally, the BHIM Incentive programs for banks, with a financial outlay of INR 26 billion⁹ in 2023, have further promoted low-value digital transactions.

Drivers for digital payments’ uptake

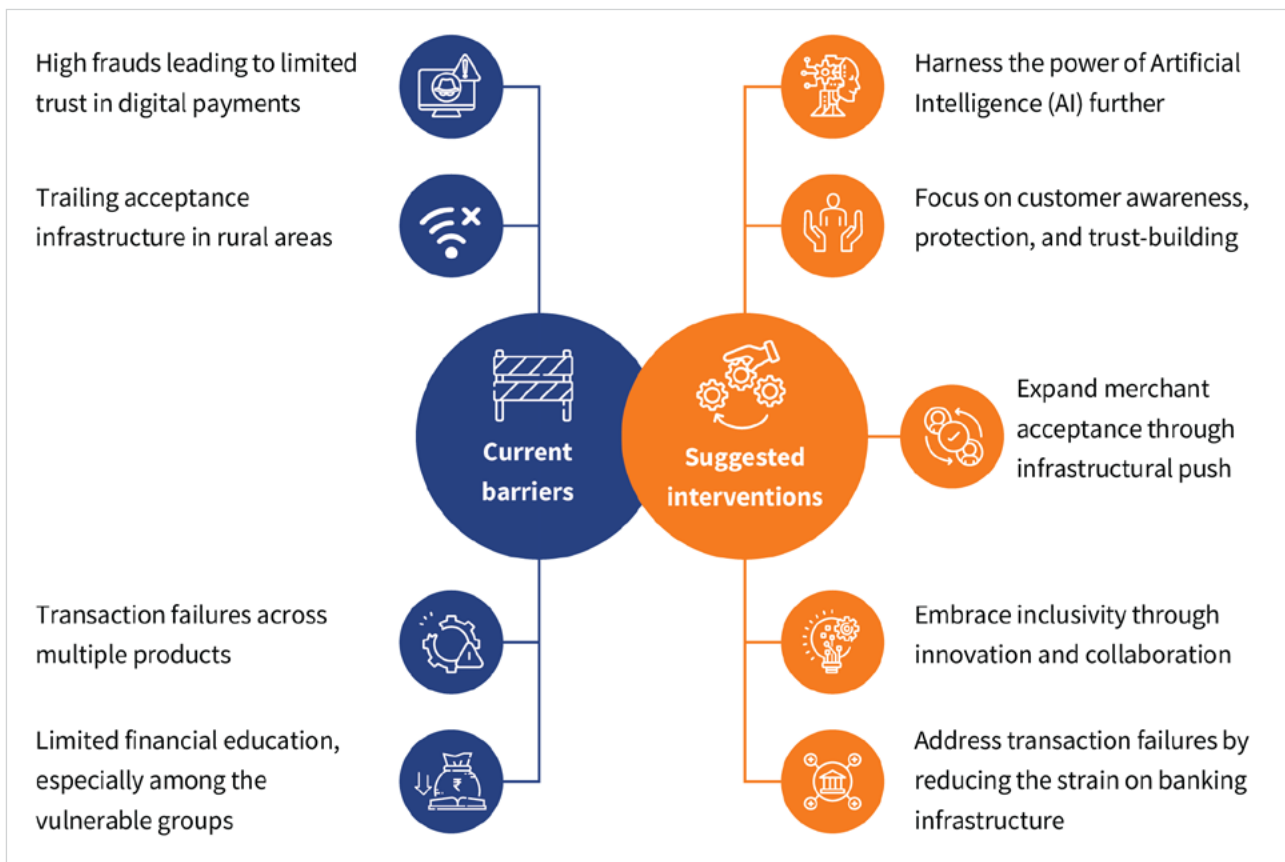
The drivers of digital payment adoption are identified through the model “Unified Theory of Acceptance and Use of Technology-II” (UTAUT-II). The model highlights the key factors that influence user attitudes toward digital payments and provides empirical insights into the impact of digital payments on user segments:

- **Performance expectancy:** Refers to the reduction in transaction failures through the efforts undertaken by PSPs and the NPCI. 90% of the digital payment users from the MSC study highlighted that their experience of digital payments became seamless over the years. 84% of the merchants from the same study who use digital payments are more motivated to accept digital payments than before, since transaction failures have reduced significantly. Performance expectancy has also increased due to the interoperability between the PSPs and QR codes.
- **Effort expectancy:** The MSC study indicates a significant adoption of digital payments among users and merchants during the COVID-19 pandemic, with a notable preference for UPI and digital wallets. Approximately 65% of users and more than 60% of merchants embraced digital transactions during this period, with young adults adapting more rapidly due to their digital savviness. Most use these platforms for peer-to-peer payments and retail purchases. At the same time, around 60% of female users, primarily homemakers, prefer BBPS for bill payments. This preference stems from the convenience of being self-reliant in managing bill payments from the comfort of their homes, without the need to depend on others.
- **Social influence:** Marketing and promotional activities significantly impact digital payment adoption. 57% of respondents were swayed by institutional promotions, 49% were influenced by social circles, and 36% by social media influencers. Notably, 79% remember campaigns by NPCI and PSPs, such as Paytm, PhonePe, and Google Pay across digital platforms, which highlights the effectiveness of initiatives, such as “UPI Chalega” and “Digital India” to raise digital payment awareness.
- **Facilitating conditions:** The digital payments expansion was marked by a significant increase in PoS machines from 1.7 million in 2016 to 8.3 million in 2023. The introduction of P2PM payments by NPCI, has crucially empowered small merchants and street vendors to embrace digital transactions. Furthermore, cashback and rewards have emerged as pivotal incentives, which motivated 71% of users toward digital payment adoption.
- **Price value:** Initiatives, such as zero customer charges on UPI and digital wallet payments and zero MDR on RuPay cards and UPI, have made digital payments lucrative for price-sensitive Indians. Further, the reducing cost of digital payment acceptance in infrastructure, UPI QR code and sound box with monthly rental of INR 125¹⁰ have made merchants increasingly adopt UPI payments. The war between various PSPs to attract customers has given rise to additional cashbacks and rewards on digital payments.



Way forward: Challenges and opportunities for growth in India’s digital payments ecosystem

India has traditionally been a cash-led economy. While the prevalence of cash to GDP is still high, the cash growth rate has been declining since FY '18 (~37% YoY growth in FY '18 to 7% YoY growth in FY '23).¹¹ This indicates a growing usage of digital payments. BCG¹² estimates that the value of digital payments in India will triple to reach INR 830 trillion by 2026, which would constitute about 65% of all payments. Industry stakeholders increasingly agree that the next set of low-income users from these regions will drive the country’s future growth of digital payments. These low-income users vary drastically regarding their financial needs, preferences, and usage. They even face different challenges regarding access to financial services, which drive account inactivity in several cases. (35% of account owners are inactive).¹³ Hence, key barriers and suggested interventions to the adoption of digital payments are:



Suggested interventions

- **Harness the power of Artificial Intelligence (AI) further:** Use AI driven models for hyper-personalization for customer retention and engagement. Through real-time analysis of transactions, anomaly detection, and biometric authentication, AI models can help build trust among users, mitigate fraud-related concerns, and ensure the safety of digital transactions. Financial service providers can also use AI for targeted outreach to the vulnerable and underserved segments.
- **Focus on customer awareness, protection, and trust-building:** Rising instances of fraud through digital payments have led to a loss of trust and reduced customer confidence in digital payments. Financial entities need to streamline their products and services to ensure customer protection. Adopting a physical + digital or “phygital” model can help customers conduct digital transactions in an assisted manner until they are digitally savvy and capable of conducting transactions independently.



- **Address transaction failures by reducing the strain on banking infrastructure:** Banks and financial service providers should reinforce the existing payment infrastructure by using cloud-based storage, emergency payment systems, such as the lightweight payment and settlement system (LPSS), and other asset-lite infrastructure models.
- **Expand merchant acceptance through infrastructural push:** Financial service providers should move beyond metros, Tier 1, and Tier 2 cities to capture the next set of merchants in Tier 3 and below regions. Offline payment solutions are anticipated to contribute approximately 75%¹⁴ of all digital merchant payments, and providers should use this opportunity by adding more QR-based solutions. Subsidized smart PoS devices and basic infrastructure, such as stable Internet connectivity can further push up digital merchant payments.
- **Embrace inclusivity through innovation and collaboration:** Collaboration is crucial to ensure innovation flourishes. Regulators are critical in fostering a conducive environment for these collaborations to thrive. Recent updates to the UPI ecosystem have opened up a unique opportunity to bring millions into the formal financial services space. These include the linkage of credit cards to UPI, credit lines on UPI, and international transactions through UPI.

As outlined above, the future of digital payments in India hinges on a strategic blend of inclusive access, technological innovation, a supportive regulatory framework, enhanced merchant adoption, and collaborative efforts. If India can address current challenges and proactively collaborate with the ecosystem, the nation can position itself as a global leader in digital payments and foster financial inclusion and economic growth. Initiatives, such as DIGIDHAN Mission, can provide the right push and collaboration possibilities for an inclusive payment ecosystem.





Section

01

Background





India's digital payments landscape has transformed remarkably over the decade. Several factors led to this transformation, which include improvements in payments infrastructure, disruptions in information and communications technology, a responsive regulatory framework, a conducive policy environment, and a greater focus on customer-centricity. Moreover, black swan events, such as demonetization and the COVID-19 pandemic, have further accelerated India's digital payments journey by spurring a behavioral shift toward digital payments among the masses.

As a result, retail digital payments have witnessed a remarkable surge and grown at 50.84%¹⁵ in transaction volume from 2017 to 2023. India clocked ~368.82 million¹⁶ daily digital transactions in FY 2022–2023. The Reserve Bank of India's (RBI) Digital Payments Index (RBI-DPI)¹⁷, which has 2018 as the base year at 100², has risen to 418.77¹⁸ in September 2023.

Concerted efforts from various stakeholders, which include the government, regulators, and financial service providers, have helped build India's digital highways. Initiatives, such as the *Pradhan Mantri Jan Dhan Yojna*¹⁹ (PMJDY) and the Direct Benefit Transfer²⁰ (DBT) mission, have created a base for universal access to accounts and subsequent continued usage—and helped further financial inclusion in the country. The “Digital India Campaign”²¹ has furthered the government's vision to transform the country into a digitally empowered nation.

Innovations, such as *Aadhaar*²² and the India Stack²³, coupled with the licensing of differentiated banks²⁴, have helped service providers offer seamless digital payment experiences to their users at much lower costs. This has brought together the famous JAM trilogy: Jan Dhan accounts for store value, *Aadhaar* for identification and authentication, and mobile for communication and self-initiated transactions.

Among these initiatives, the Ministry of Electronics & Information Technology²⁵ (MeitY), Government of India, has played a pivotal role to create an open and secure digital ecosystem and shared digital infrastructure. It has enabled interoperability and built safeguards within digital platforms. Since its inception in June 2017, MeitY's DIGIDHAN Mission²⁶ has empowered the public and private sectors to drive innovation, improve service delivery, and offer a user-centric experience for various digital payment services.

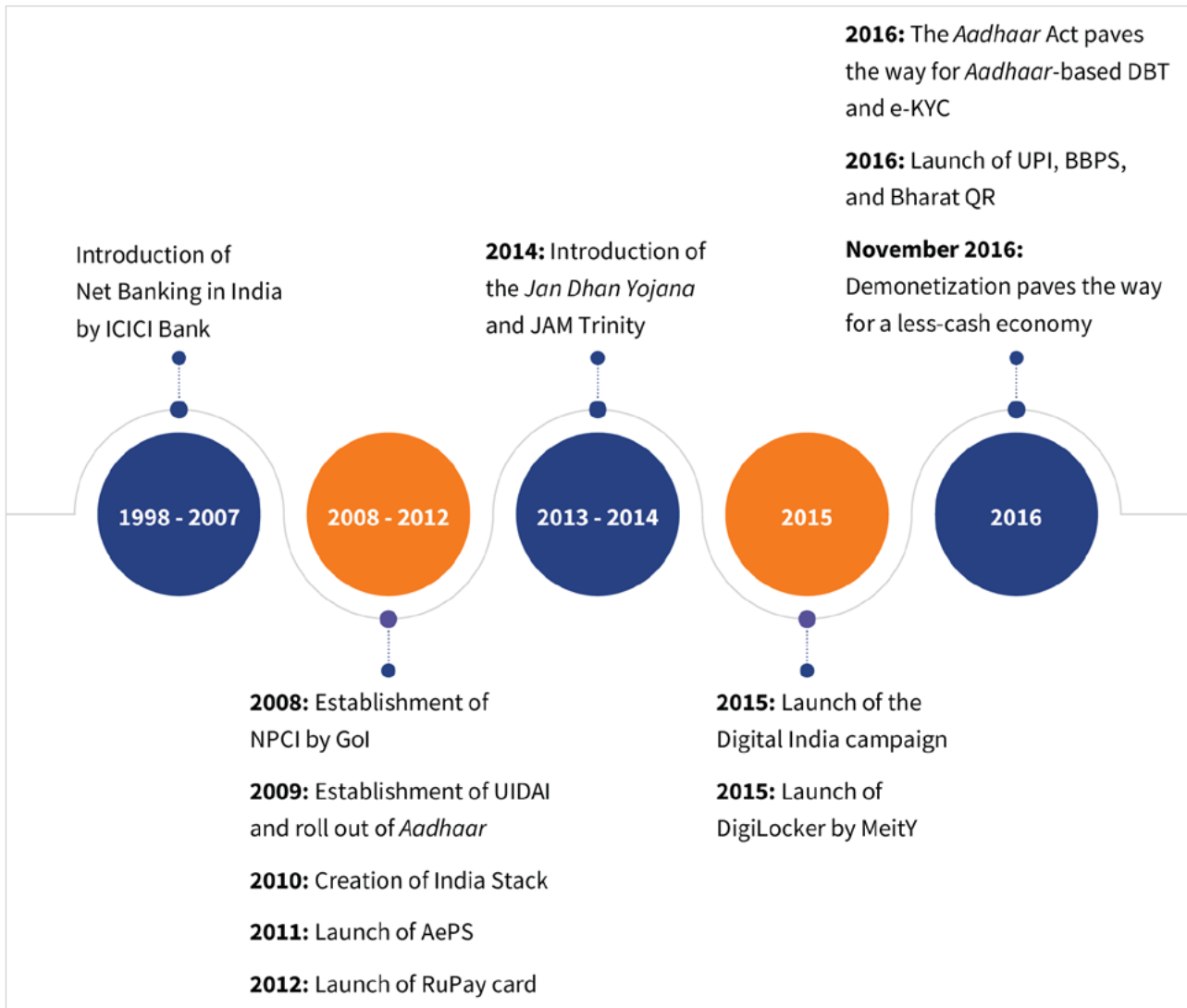
1.1: Digital payments landscape before the launch of the DIGIDHAN Mission

The push to digitize India's banking and payment services started in the late 1990s, with the creation of online banking services from several large players operational in the country.²⁷ The RBI and different payment systems operators (PSOs) facilitated the payment systems.





Figure 1: Timeline of the digital payments landscape before DIGIDHAN launch



In 2008, the RBI and the Indian Banks Association (IBA) established the National Payments Corporation of India (NPCI)²⁸ as a hub for all retail payment and settlement systems in the country. NPCI works with different stakeholders, which include regulators, banks, payment service providers, and FinTechs, to design solutions that address the mass market's needs. Starting with the National Financial Switch (NFS) in 2010, NPCI has played a critical role in pushing India toward a less-cash economy with initiatives, such as IMPS, the RuPay payment network, AePS, Bharat QR, NETC, and, most importantly, UPI.

In 2009, the Unique Identification Authority of India (UIDAI) launched *Aadhaar*, a 12-digit unique identifier, to provide a universal ID to every resident in the country. *Aadhaar* has helped create a foundational ID for more than 1.38 billion²⁹ Indians. The growth of *Aadhaar* is entwined closely with PMJDY. *Aadhaar* has enabled residents to open a bank account using the electronic repository of demographic details and photographs verifiable through biometric authentication.

India Stack, introduced in 2010, is an independent open framework that enables service providers to develop sophisticated and customer-centric products at significantly lower customer acquisition and service costs³⁰. Besides *Aadhaar*, other layers of the India Stack have transformed India's payments and financial services industry. These include the paperless layer through eKYC, e-Sign, and DigiLocker, the cashless layer through *Aadhaar*-based payments, UPI, and the consent layer.



The Digital India campaign launched in 2015 to transform India digitally and build a knowledge-heavy economy. It focused on three key areas: digital Infrastructure, governance, services on demand, and the digital empowerment of citizens. Since its launch, the campaign has significantly contributed³¹ to help build India's digital public infrastructure (DPI) for holistic financial inclusion.

In 2016, NPCI introduced the Unified Payments Interface (UPI) as a real-time interbank payment system that integrates multiple bank accounts of any participating bank into a single mobile application. It has enabled a seamless payment experience for individuals, businesses, and the government by allowing payment service providers to innovate on the existing technology infrastructure to build user-centric applications. UPI payments have now surpassed the use of credit or debit cards in India, with a penetration of 40% compared to 6% for credit cards.

Besides, unprecedented events, such as the government's decision to demonetize³² high-value currency in 2016, furthered India's digital payments journey by spurring a behavioral shift toward digital payments among the masses. Before demonetization in 2016, digital payments accounted for only about 10% of all transactions in India, which has grown to over 20%³³ in the years since.

1.2: Launch of the DIGIDHAN mission

In 2017, the Ministry of Electronics and Information Technology (MeitY) launched the DIGIDHAN Mission under the Digital India Program. Given the rise of digital technologies and the usage of mobile phones, the government identified the need for a focused initiative to establish an inclusive and robust digital payments ecosystem in India that all sections could access, regardless of education levels, rural-urban divide, and disparities. With a vision of a redefined cashless Indian economy, the mission was set up with the objective to:

- Achieve the target of 25 billion digital payment transactions in FY 2018 through digital payment modes, which include UPI, USSD, IMPS, *Aadhaar* Pay, and debit cards;
- Promote and oversee the establishment, growth, and sustenance of a robust, secure, and inclusive National Digital Payments ecosystem;
- Create requisite enabling infrastructure for the government's digital payments service delivery, Electronic Payments and Receipts (EPR), and Direct Benefits Transfer (DBT) program;
- Facilitate suitable standards for efficient, affordable, and secure digital payment services;
- Ensure the security of the digital payment ecosystem;
- Promote research and innovation, including the development of new digital payment products, platforms, services, and sustainable delivery models.

The mission had several functions. These ranged from reviews of existing legal, institutional, policy, and regulatory frameworks related to digital payments, facilitation of research and development for digital payments, proposal of measures to enhance security within the digital payments ecosystem, and formulation and regulation of financial incentive programs.

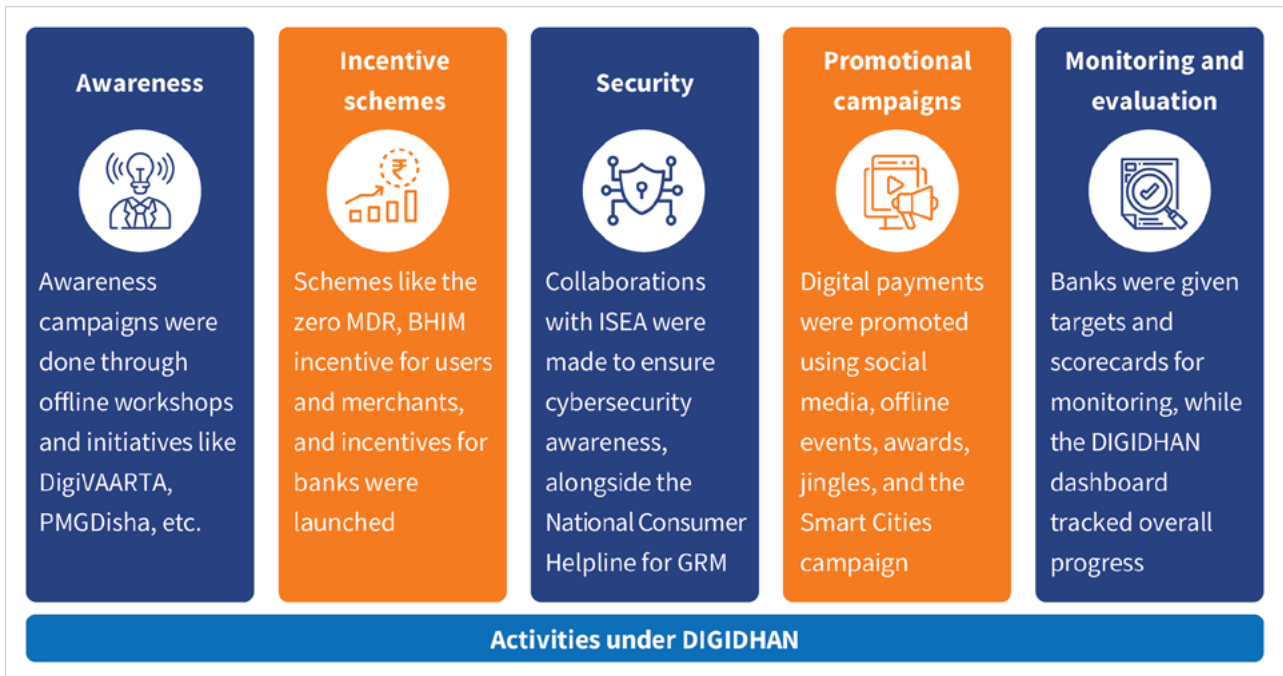
The mission has worked extensively to promote the usage and uptake of digital payments in India in terms of awareness, accessibility, and ease. At an aggregate level, the mission has helped the country achieve a record volume of ~116.6 billion³⁴ digital transactions in FY23-24, as of 11th December 2023, which surpassed the initial target of 25 billion annual transactions. The past five years, in particular, have seen a massive transformation in the country's digital payments landscape. While the UPI³⁵ hit record-high numbers³⁶, the *Aadhaar*-enabled Payment System³⁷ (AePS) has transformed the access of subsidies to beneficiaries, the Bharat Bill Pay System³⁸ (BBPS) has consolidated



the recurring bill payments industry under one payment system, and QR codes³⁹ continue to drive the merchant acceptance network.

1.3: Digital payments landscape after the launch of the DIGIDHAN Mission

Figure 2: Activities undertaken by DIGIDHAN



MeitY launched **many awareness and capacity-building initiatives** under the mission, such as DIGIDHAN *Melas*, DIGIDHAN *Vyapar Yojana*, and Lucky *Grahak Yojana*, to create a nationwide promotion of digital payments. A major initiative under the Mission was MeitY’s DigiVAARTA, which sought to promote digital payments across India through interactive two-way SMS communication. The program sought to educate the masses about various modes of digital payments and ways to use each mode, content for which was circulated in multiple languages for maximum reach. Other key events included the Digital Payments *Utsav* (Digital Payments *Sandesh Yatra*), the DIGIDHAN *Utsav*, the DIGIDHAN awards, and the Fintech *Yatra*.

The mission recognized the importance of **monitoring and evaluation** of the initiatives undertaken by various stakeholders to ensure suitable checks and balances were in place. This was done through target allocation for banks and setting a scorecard to induce a sense of healthy competition. The DIGIDHAN dashboard⁴⁰ was launched to monitor the total number of digital transactions across various modes on a single platform and promote digital payments and infrastructure to develop a cashless economy. It is the only dashboard that provides a consolidated view of 16 digital payment modes, such as UPI, IMPS, debit card, and credit card, among others, from the RBI, NPCI, 110 banks, and 100 smart cities, states, and ministries.

The DIGIDHAN Mission also launched several **incentive programs** for users, merchants, and banks to promote digital payments. Measures, such as the waiver of MDR charges⁴¹ on RuPay debit cards, UPI, and UPI QR codes, provided financial incentives to promote digital payments. Similarly, BHIM incentives, MDR reimbursement schemes for merchants, and bank annual incentive schemes (FY 22, FY23) continue to accelerate the growth of digital payments under the Mission further.

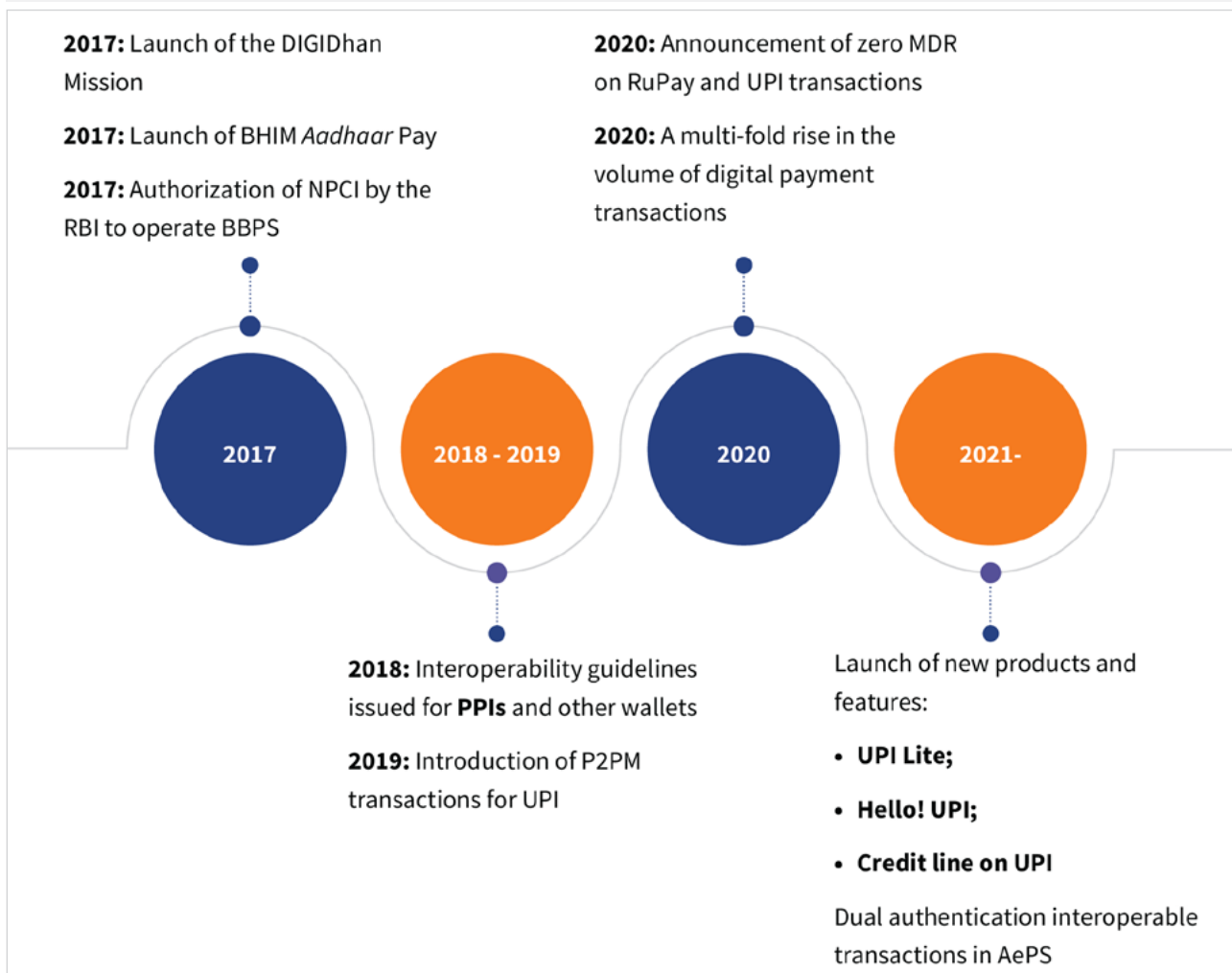
Promotional campaigns under the DIGIDHAN Mission helped increase awareness and trust in digital payments through various offline and online modes. The “*Chutki Baja Ke*”⁴² anthem helped gain tremendous traction for digital



payments. The Smart City Campaign contributed to the reach and success of the BBPS, a one-stop ecosystem for payment of all bills, which provides an interoperable and accessible bill payment service to all customers across India. Other efforts to promote digital payments included awards given to stakeholders in recognition of their work to accelerate digital payment growth, workshops through NIELIT to generate awareness of digital payment tools, and the use of social media for digital payment promotion, especially during the festive season.

MeitY undertook several steps to ensure awareness of safe digital payment transactions. It carried out awareness programs on safe digital payment transactions on a routine basis through the Information Security Education and Awareness (ISEA). It also promoted the National Consumer Helpline (NCH) as a single platform for users to register grievances and standardize the GRM process alongside all major financial service providers.

Figure 3: Timeline of the digital payments landscape after the DIGIDHAN launch



Consequently, several initiatives took off, such as the launch of UPI 123Pay in 2022 to create a provision for feature phone users to use UPI payments service securely. Similarly, P2PM⁴³ transactions allowed small-sized merchants and street vendors to accept digital payments if they had a savings account. Such changes in the digital payments space have exponentially amplified the reach and penetration of digital payments' usage among various target segments in the country. Other initiatives focused on innovation for the population segments that were historically excluded from traditional modes of digital payment. These initiatives include e-RUPI disbursement for education scholarship fee payments and product launches under the DIGIDHAN Mission.

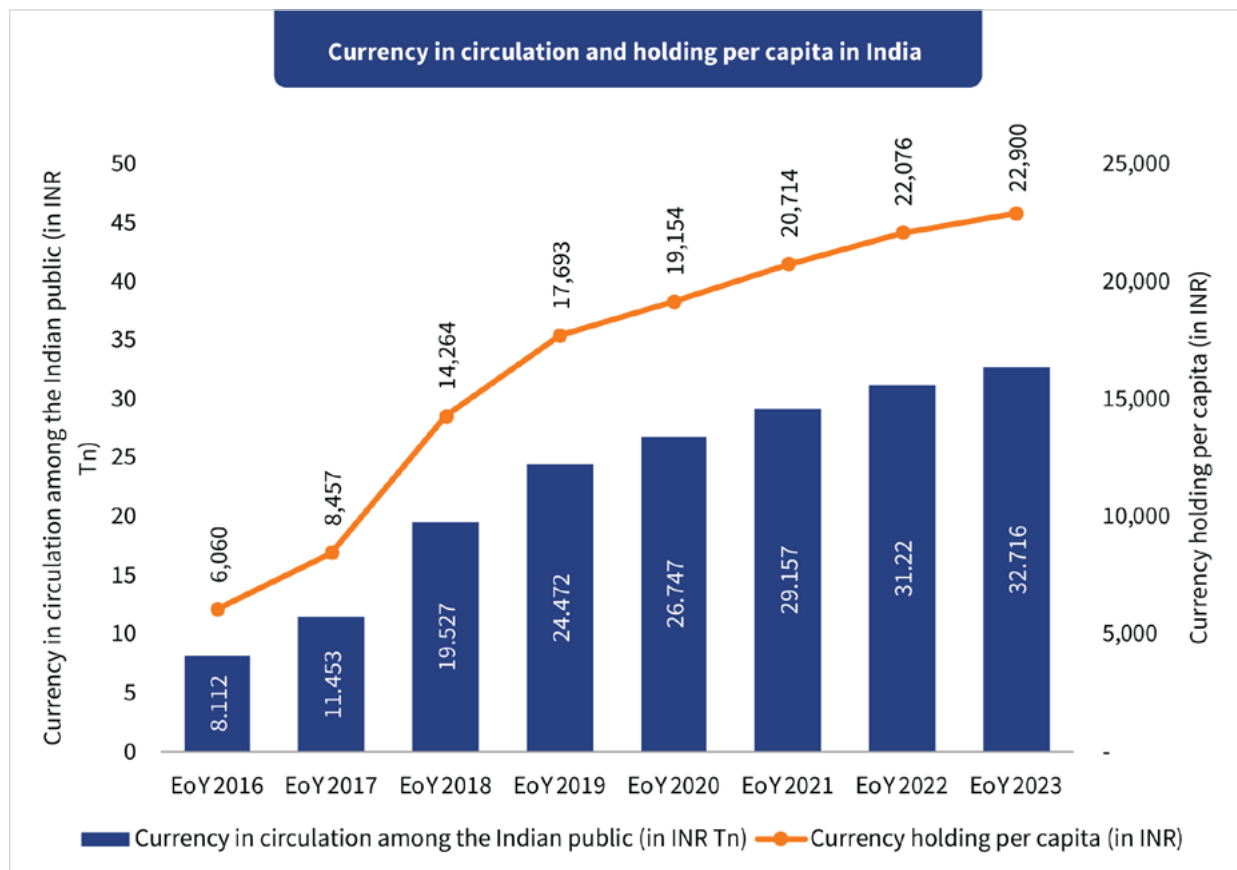


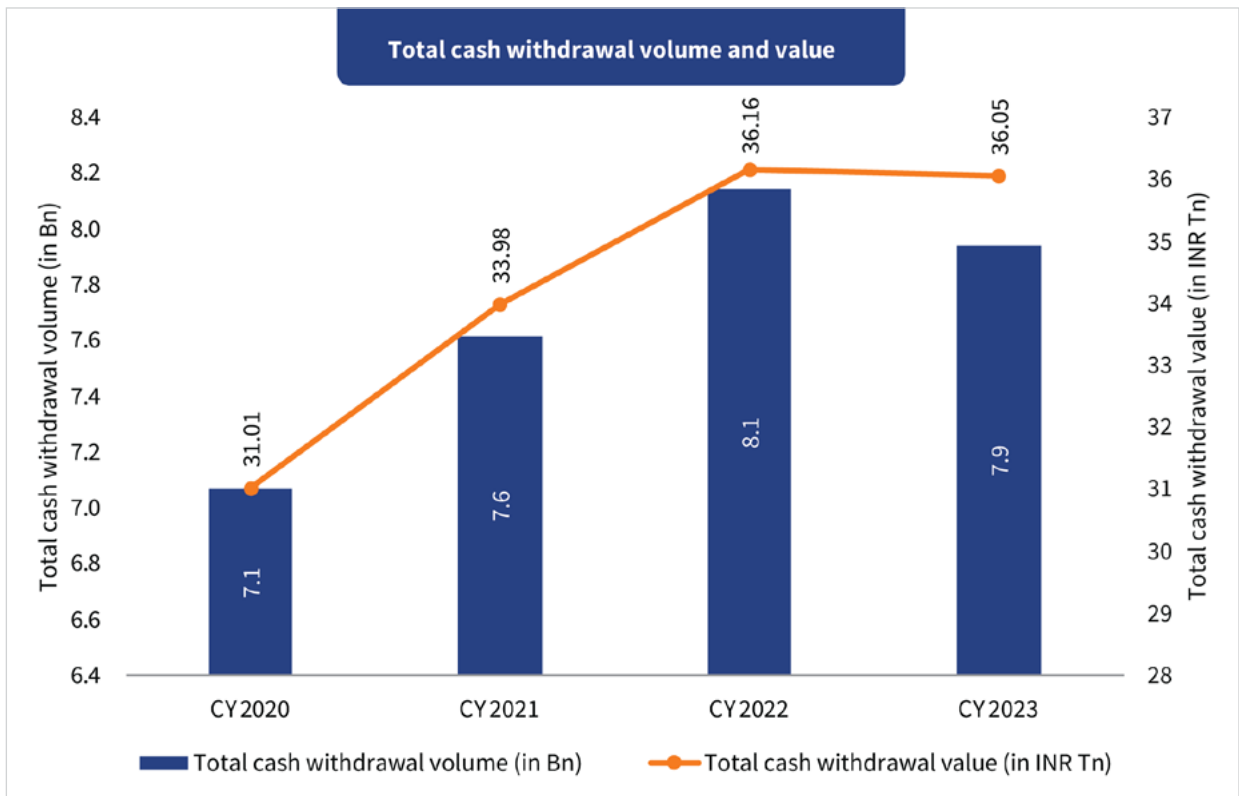
However, given the expanse of the growth of digital payments and its subsequent impact, it becomes imperative to analyze the growth of digital payments under the DIGIDHAN Mission and its impact on the payments ecosystem. Such insights will help to gauge how to grow digital payments, make policy and infrastructure changes to catalyze this growth, and build a financially inclusive digital payments ecosystem as it expands.

Cash in circulation has been increasing, mainly as a store of value and not as a payment mode

The digitalization of India’s payment systems continues to influence the economy markedly. This influence is seen in the shift from cash to digital transactions, as India accounted for more than 46% of all global digital payments in 2023.⁴⁴ While the adoption of digital payments has been widespread, the relevance of cash for payments and settlement remains significant. Cash in circulation as a GDP percentage has grown from 8.7% in FY17 to 12.7%⁴⁵ in FY23. A study undertaken by the RBI⁴⁶ suggests that this growth in cash could be attributed to several factors, chief among which is its function as a “store of value.” Other reports, such as by CMS India, observe that among key factors that keep cash relevant are demographic factors, such as limitations from the unbanked and underbanked population, low digital literacy, and low internet penetration.

After the demonetization in Nov 2016, the cash-in-circulation (CIC) to GDP ratio declined sharply from 12.1% (average) to 8.68% in FY 2017. Subsequently, the CIC to GDP ratio has moved from 10.7% to 14.39% between FY 2018 and FY 2023.⁴⁷ However, as per the RBI data, cash withdrawals at ATMs reduced, while cash velocity slowed down, which indicates that the CIC represents the “precautionary” emergency savings people tend to stock in households rather than looking at it from a payment preference perspective. This is evident from the increased share of large-denomination banknotes relative to the stagnant growth of smaller notes and coins that reflects retail spending patterns, as typically, change is returned in cash transactions.





While India has witnessed increased digital payments, cash will coexist and remain relevant for a section of society. This is due mainly to factors, such as a precautionary store of value, a sizeable underbanked population, cultural influence, infrastructure challenges, and a slower pace of financial and digital literacy.





Section

02

The approach for impact assessment of the DIGIDHAN Mission





This report assesses the progress of different initiatives under the DIGIDHAN Mission and their overall impact to shape India's digital payments ecosystem.

2.1: Impact assessment approach

We sought to assess the impact of digital payments and the overall DIGIDHAN Mission through interviews with supply and demand stakeholders, revealing insights into their initiatives, challenges, and implementation strategies. Comprehensive interviews with 17 stakeholders were conducted to gauge their efforts to boost the usage and performance of the digital payments ecosystem. The stakeholders included government and allied bodies, regulators and policymakers, payments infrastructure providers, and FinTechs, among other supply-side stakeholders.

Qualitative and quantitative research was conducted in nine states with a nationally representative sample of more than 80 and 2,100 respondents, respectively. The respondents included multiple user segments across various demographics, and the research focused on rural locations, merchants, and female customers. The quantitative research provided a first-hand view of the trends in awareness, access, and usage of digital payments among customers and merchants. In-depth qualitative interviews complemented the quantitative research to understand the behavioral insights, challenges faced, and motivating factors behind respondents' adoption of digital payments.

These parameters were amalgamated to build a framework that assesses the mission impact. The framework used two key inputs – i) initiatives for digital payments taken by government and private players and ii) drivers for the uptake of digital payments. Both components contribute to the overall outcomes and will likely increase digital payment adoption rates, bring about a broader acceptance among merchants and users, and provide an enhanced user experience to encourage sustained digital payment usage. Hence, the impact of digital payments is assessed by analyzing i) how the digital payments ecosystem has grown by developing the growth score and ii) how digital payments have impacted users' lives. Both these outputs form the overall impact of the DIGIDHAN Mission on the country's landscape.

Initiatives for digital payments: This input details the extrinsic efforts made to increase digital payment usage and focuses primarily on the role of government policies and programs designed to promote digital transactions. Additionally, it considers the various supply-side initiatives by banks, FinTechs, and payment service providers (PSPs). These initiatives are evaluated based on their effectiveness to increase awareness of digital payments, improve access to these services, and ultimately drive usage among diverse user groups and merchants.

Drivers for the uptake of digital payments: This input explores the intrinsic factors that have influenced the increase in digital payments. It highlights the improved user experience and convenience digital payments provide as significant factors in their adoption. It highlights the increased usage among the various user groups due to standardization efforts and implies that a unified approach to digital payments has made them more accessible and user-friendly.



Figure 4: Impact assessment framework



How the digital payments ecosystem has grown: This outcome covers the growth of the digital payments ecosystem from the launch of the DIGIDHAN Mission to the current levels (2017 to 2023). It maps the growth of 44 parameters over this period and their contribution to the growth of the digital payments ecosystem. These parameters are categorized into key enablers—infrastructure and digital payment instruments and their effects through the uptake of digital payments in socioeconomic factors. Information from secondary sources and stakeholder interviews have been used to develop this growth score.

How digital payments have impacted the users' lives: This outcome covers the impact of digital payments on the daily lives of users and merchants and the convenience it has brought over cash transactions. Through primary interviews with users and merchants, it analyzes the triggers for change in consumer behavior and drivers for its sustainability. It also examines the vital digital payment products and their prominent use cases. It will also help identify challenges that remain in digital payments and need focus for higher adoption.

The subsequent sections cover these outcomes and inputs.





Section

03

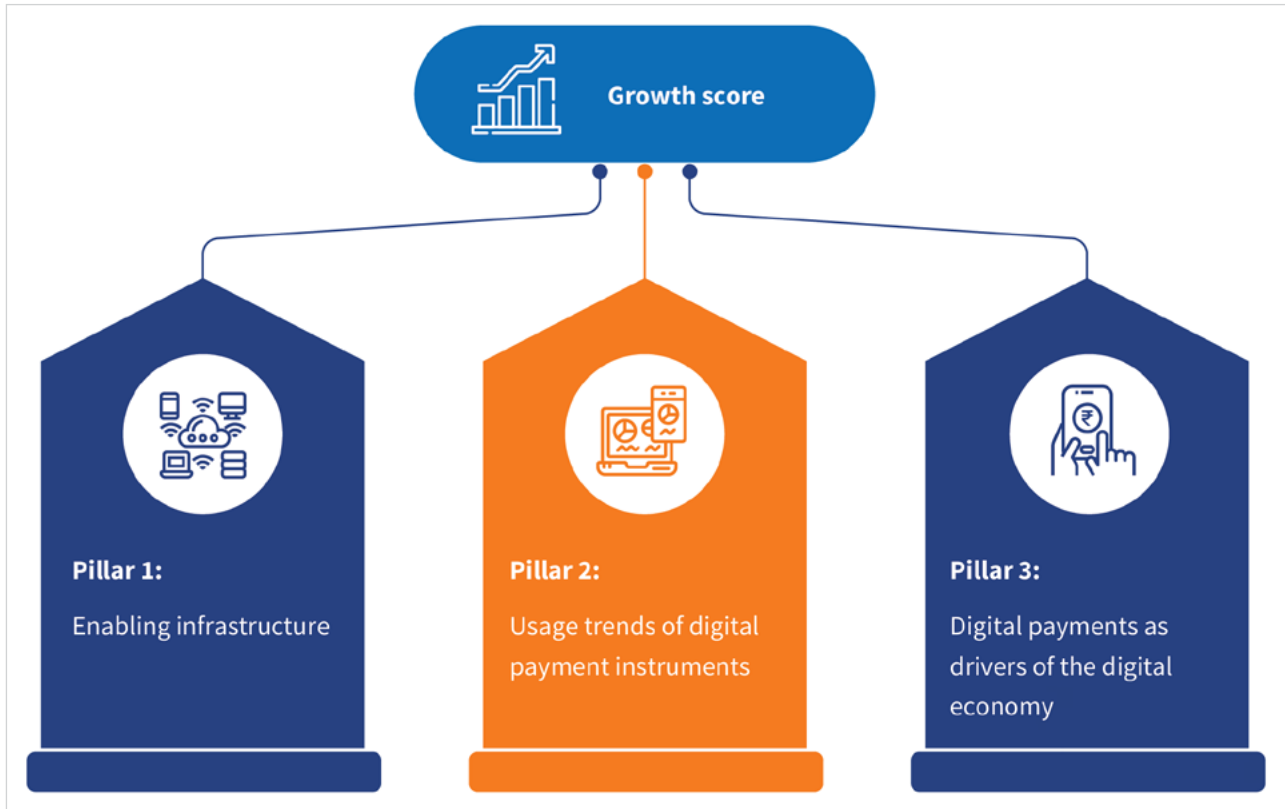
How the digital payments ecosystem has grown





The DIGIDHAN Mission surpassed its objective to achieve a target of 25 billion digital payment transactions in 2017-18 through digital payment modes, including UPI, USSD, IMPS, and BAP. It empowered the public and private providers to drive innovation, improve service delivery, and offer a user-centric experience for various digital payment services. On a broad scale, the mission significantly contributed to the country's accomplishment of 116 billion digital transactions in FY23-24 as of 11th December 2023⁴⁸.

Figure 5: Key inputs to determine the growth score for the digital payments ecosystem

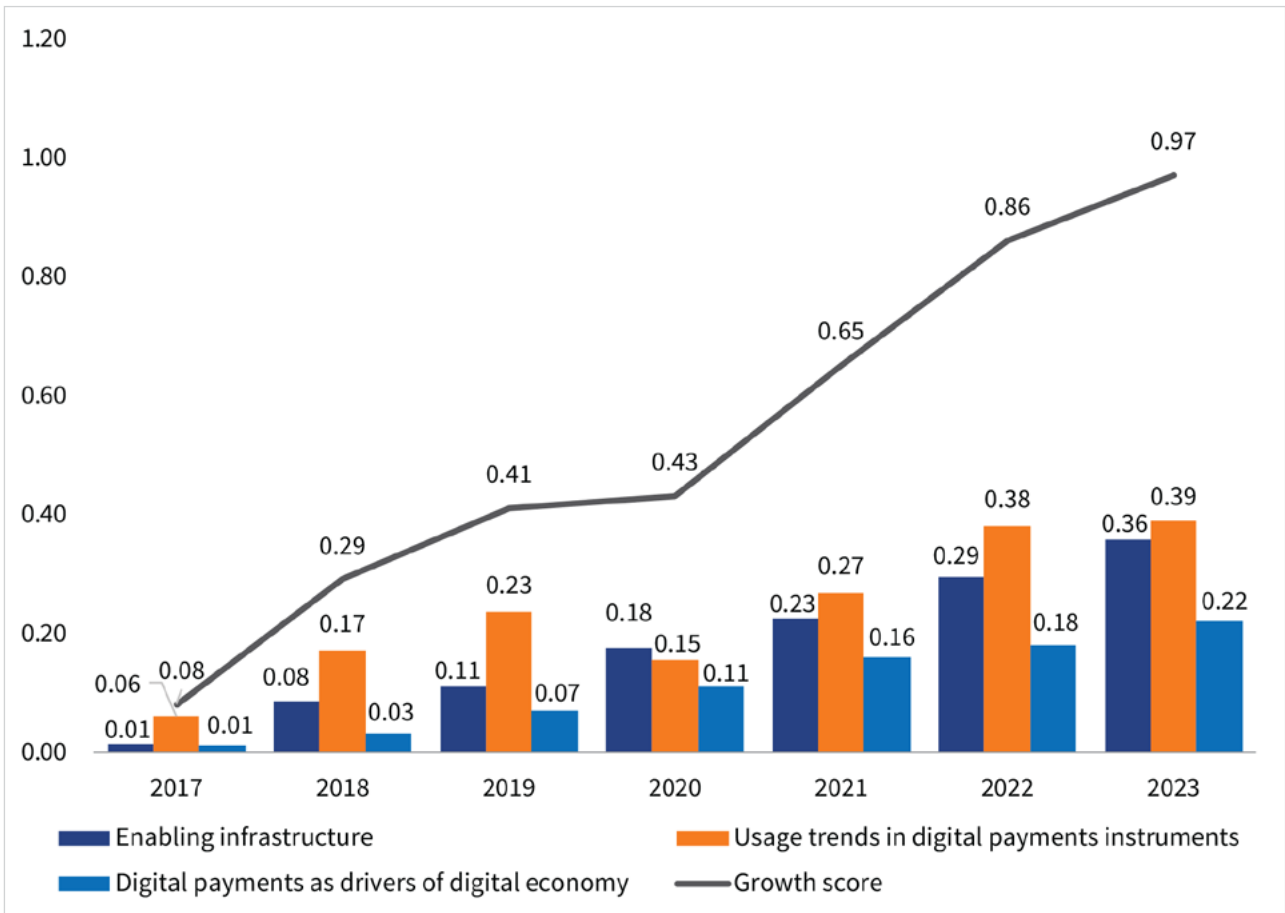


As per our analysis, India's digital payments ecosystem has grown 11 times between 2017 and 2023 after the DIGIDHAN Mission's launch. This section traces this growth in digital payments by measuring the improvement of three pillars related to the digital payments' ecosystem as drivers of the digital economy—infrastructure, digital payment instruments, and digital payments. The ecosystem's growth is measured through a growth score for 2017 to 2023 against different parameters included in the three pillars.

The growth score has been scaled between 0 and 1 (minimum value being 0 and maximum being 1). This scaled value is multiplied by each parameter's weight to get the desired score. The annexes provide more details on the methodology to calculate the score.



Figure 6: Growth score for digital payments in the past seven years



The analysis presented here indicates that the growth score derived from an evaluation of the three pillars exhibited a CAGR of 42% between 2017 and 2023. The robust growth rate underscores the advancement of digital payments and their increasing influence during this period.

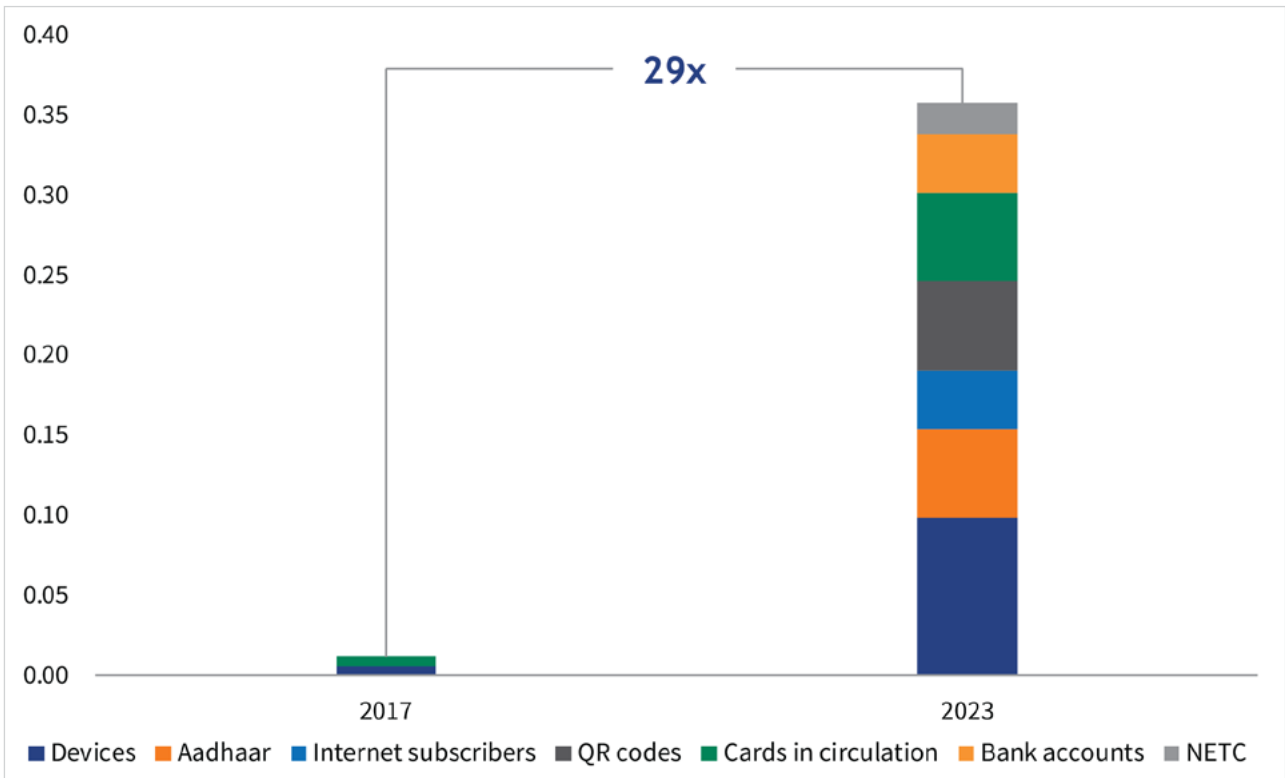
3.1: Enabling infrastructure for digital payments

The enabling infrastructure pillar measures and estimates the countrywide growth and adoption of the infrastructure that facilitates the usage of digital payment instruments. The pillar registered a score of around “0.01” in 2017, the year the DIGIDHAN Mission was launched. In contrast, it registered a score of “0.36” in 2023, which shows a growth of around 29 times during this period.

As shown in the figure, the sub-indicators that comprise the enabling infrastructure for digital payments in the country have grown significantly, with devices such as smartphones and PoS showing the highest growth. Several new parameters, such as FASTag and QR codes, were added over this period.



Figure 7: Growth in infrastructure pillar

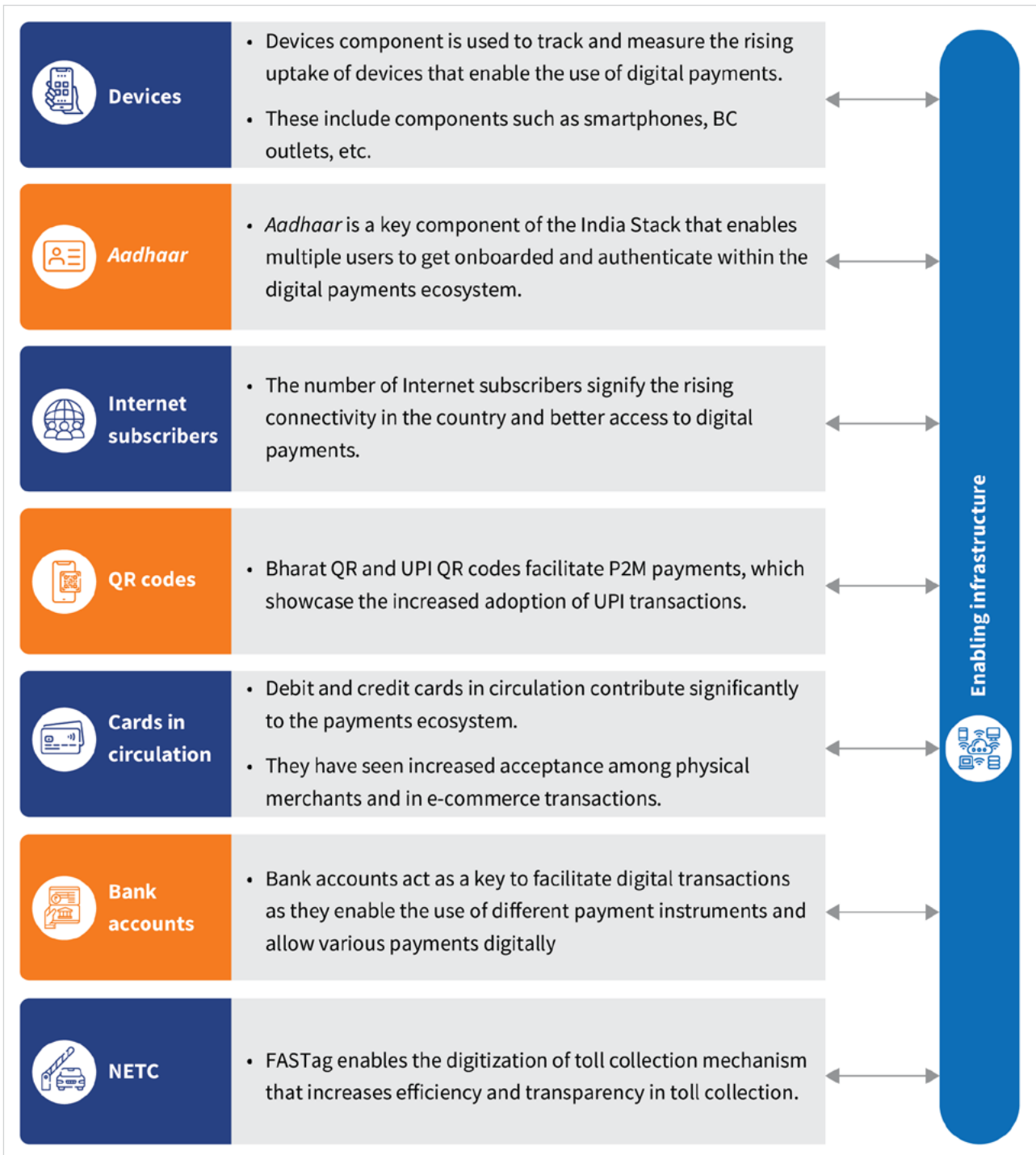


These factors together form the bulk of the enabling infrastructure for digital payments.





Figure 8: Enabling infrastructure for digital payments pillar and its sub-indicators



This growth in the enabling infrastructure, led by the creation and promotion of the JAM Trinity, has played a transformative role to enhance the digital payments ecosystem. The integration of these components has substantially impacted the adoption and deepening of digital payments across the country. The Jan Dhan program provided universal banking access, Aadhaar offered a unique and secure method of identity verification, and the widespread availability of mobile phones has bridged the gap between traditional banking systems and the digital world. The Jan Dhan Yojana opened 440 million new bank accounts during this period.

Government reforms and increasing smartphone and mobile internet usage fueled the growth in the adoption of digital payments infrastructure. The large-scale efforts to build the India Stack provided easy access for the population



to enter the digital payments ecosystem. The smartphone market has grown significantly, with more than 954 million users⁴⁹ in 2023. This growth can be attributed to reduced smartphone retail costs, wireless data, and rising consumer sentiment toward smartphone ownership. Internet consumption among Indian customers has skyrocketed to 19.5 gigabytes (GB) monthly per user in 2022 from 5.7 GB in 2017⁵⁰.

Debit cards have played a significant role in the growth of financial instruments in India, especially with the development and rise of the RuPay network. Before 2022, debit cards were essential for customers to register on the UPI network. However, with the NPCI’s approval, *Aadhaar*-based onboarding on UPI became possible,⁵¹ which expanded the accessibility of digital payments. The growth in the debit card market has been fueled by the rising number of RuPay Debit Cards issued by banks, which have issued more than 700 million debit cards till now.⁵² RuPay cards have significantly helped reach India’s unbanked population. The RuPay network has also benefitted from the regulation of the zero-MDR policy made under the DIGIDHAN Mission.

3.2: Usage trends of digital payment instruments

The second pillar, Usage trends of digital payment instruments, measures the country’s demand-side integration of digital payments. This pillar highlights the increasing customer preference for digital transactions and the assimilation of digital financial services into everyday life. The pillar recorded a score of “0.39” in 2023, compared to “0.06” in 2017, which translates to a growth of around 5.5 times. The various money transfer products, such as NEFT, IMPS, and UPI, largely drive this growth. Other products, such as mobile wallets, were also launched during this period.

Figure 9: Growth in usage trends of digital payments instruments pillar

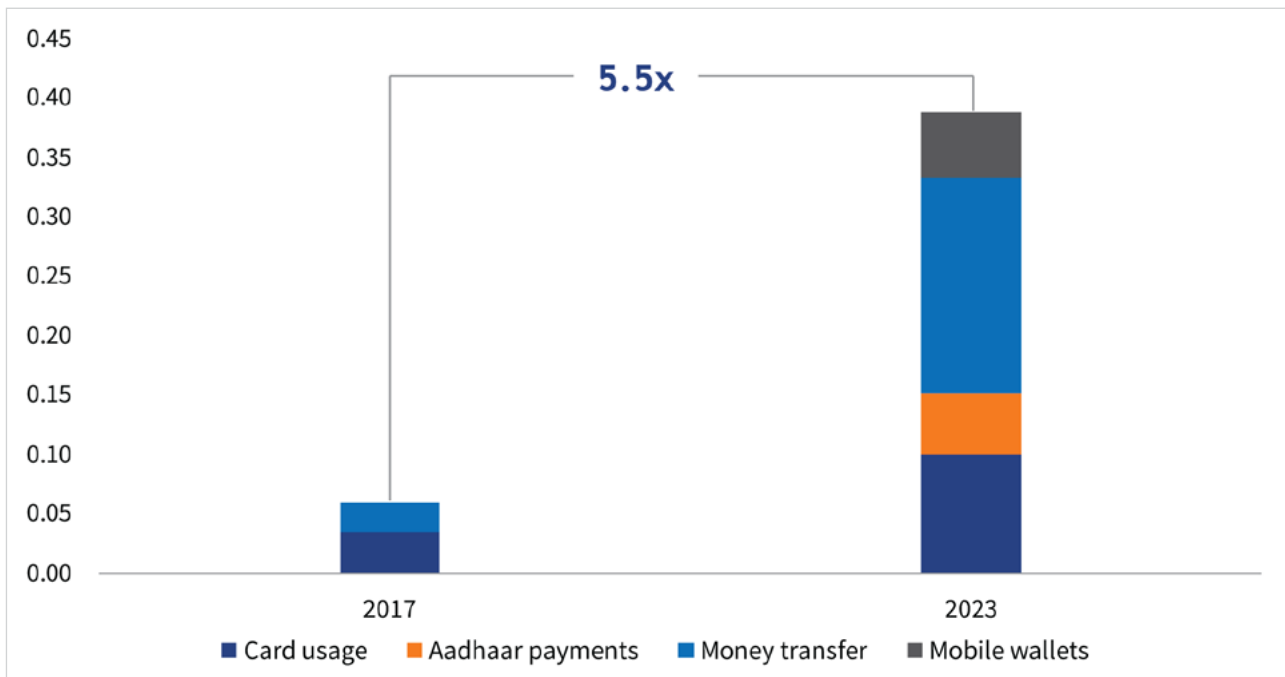
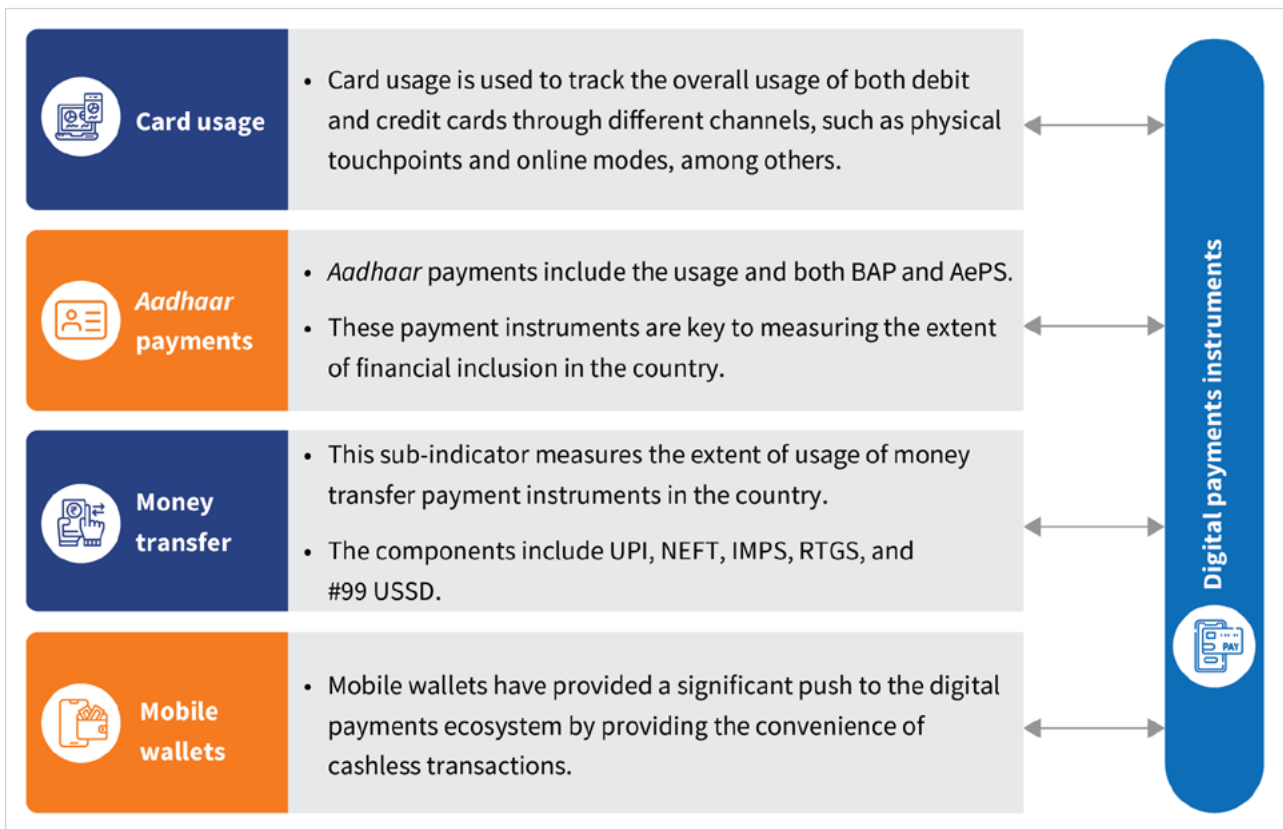




Figure 10: Usage trends of digital payment instruments and their sub-indicators

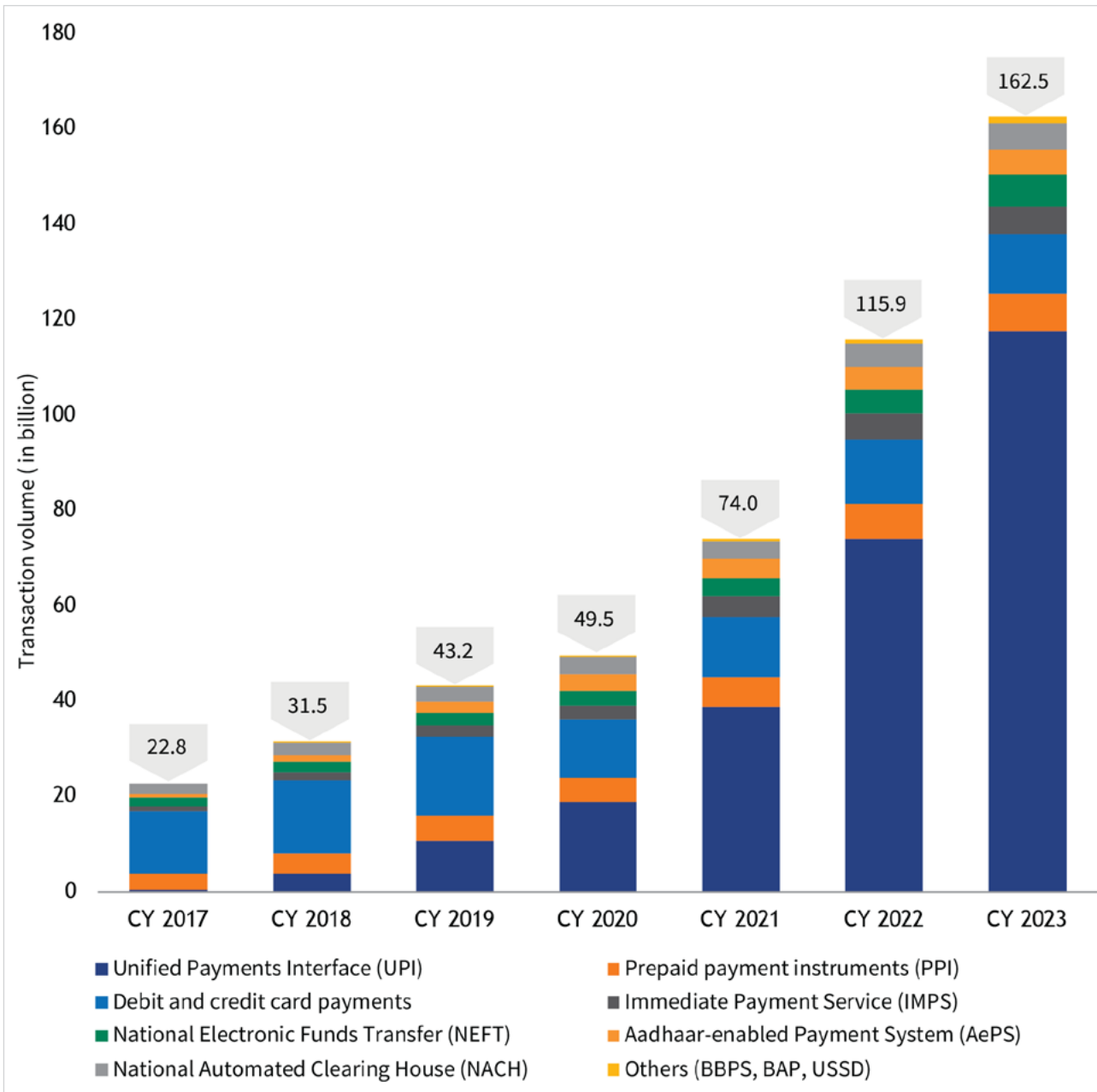


Innovations in UPI have spearheaded the usage of digital payment instruments. Its adoption by stakeholders, including individuals and MSMEs, has been bolstered by the easier availability of the mobile infrastructure along with the falling data costs over the years. With the onset of the DIGIDHAN Mission, many regulatory changes have supported UPI's growth. These changes have promoted its adoption through newer use cases and products based on existing UPI architecture. Increased adoption has led to an increase in UPI use across various customer segments.





Figure 11: Growth in retail payments by volume (channel or instrument wise) (# billion)



As UPI drives day-to-day digital payments in India, AePS has enabled access to finance among segments that rely on assisted transactions. AePS was a critical cash-out medium during the COVID-19 pandemic for migrants, daily wage-earners, and other informal sector workers.⁵³ The rising AePS transactions are a critical indicator of healthy digital payment penetration.

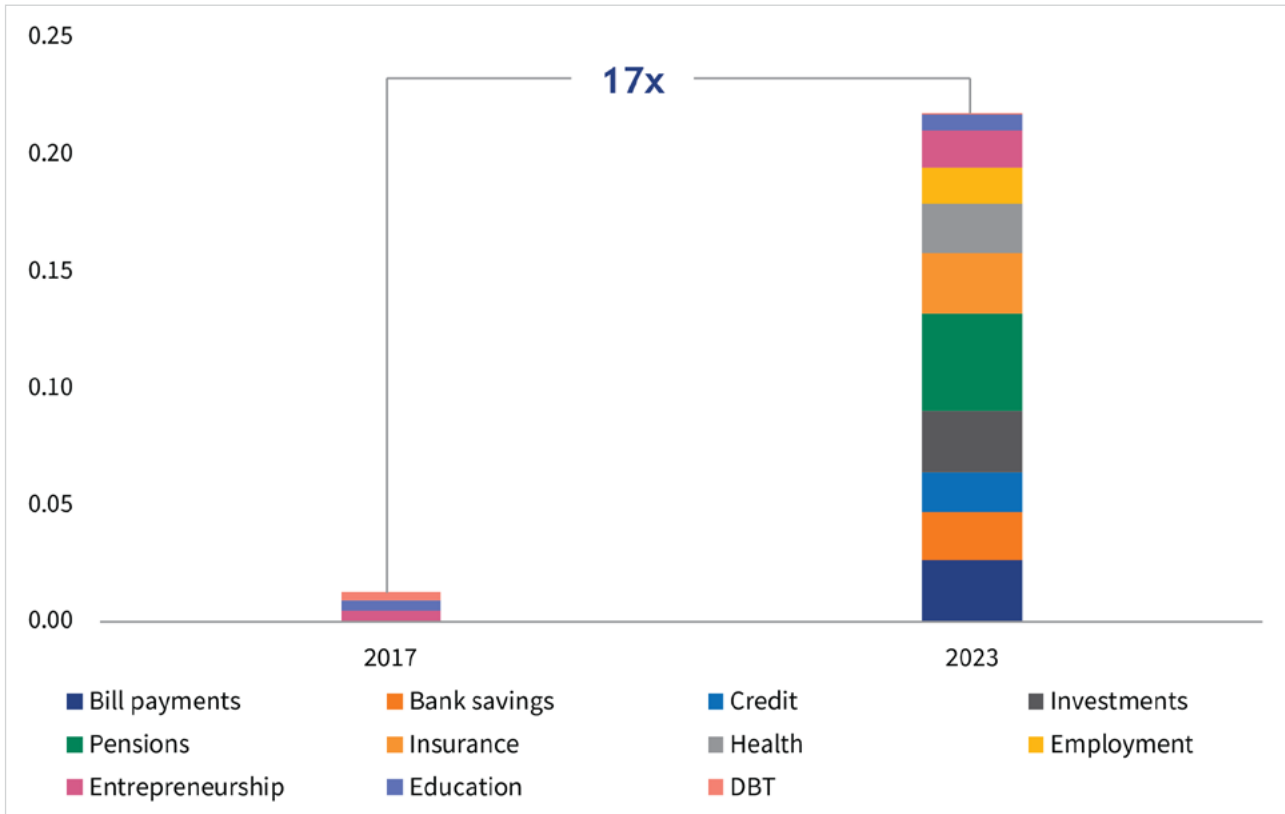
3.3: Digital payments as a driver of the digital economy

The third pillar highlights the interplay of digital payments with digital economic factors. The expansion in digital financial services goes beyond just the promotion of financial inclusion. It contributes significantly to stimulating economic growth and creates employment opportunities. The transition to digital payments can potentially drive financial inclusion and resilience, particularly in India’s low-income workforce.



Digital payments, in these cases, act as enablers for other sectors in the digital economy. Complementary factors, such as bill payments, health indicators, insurance, and savings, grow through their digital channels as the payments grow. This shift helps integrate the population into the formal financial system and enhances their ability to save, borrow, and invest. It also helps transform how these sectors operate, enhances efficiency, and broadens the reach of services to include populations previously underserved. This holistic growth contributes to the digital economy and helps the nation grow.

Figure 12: Growth in the industries linked to digital payments



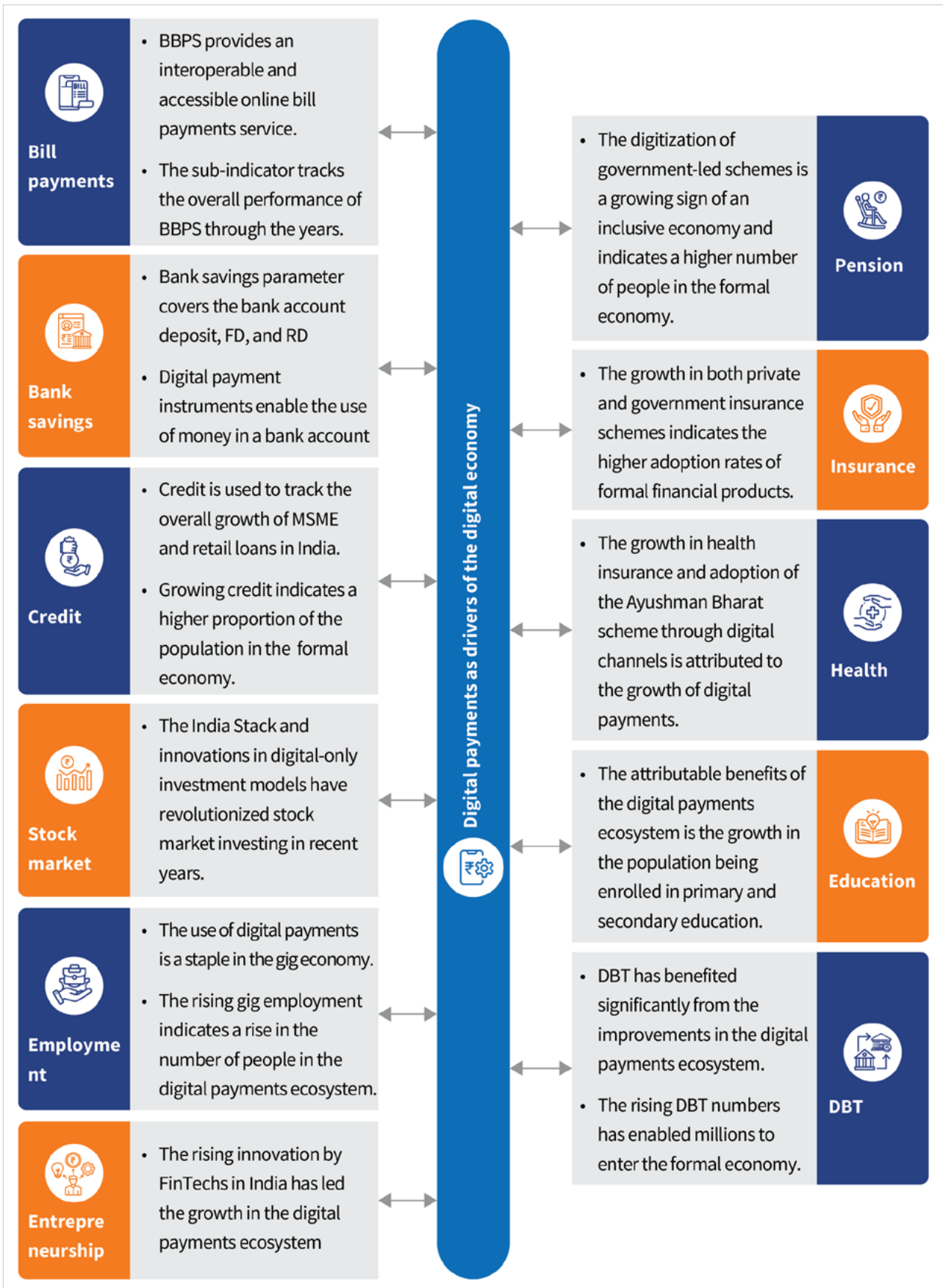
Hence, this pillar estimates the countrywide growth in the sectors interlinked to digital payments. It registered a score of “0.01” in 2017 and grew 17 times over six years to a score of “0.22” in 2023. Figure 12 here outlines the growth in the various sub-indicators that constitute the third pillar and showcases the growth in the individual sub-indicators.

This pillar’s growth has been observed through the growth of the sub-indicators. For instance, the “Investments” sub-indicator showcases the interconnectedness of digital payments and financial markets. The rise of the digital-only broker model, coupled with easier and more efficient payment options through UPI and NACH⁵⁴ for automated payments, encouraged investments among an increased proportion of the population.

Similarly, the sub-indicator for bill payments tracks the overall adoption and use of BBPS. The increase in the adoption of BBPS can be attributed to the increased convenience offered to consumers. The number of billers on the platform has risen to 21,600⁵⁵ in 2023. The consistent increase in billers, which range from credit card and broadband to online toll payments, has ensured the growth in its usage.



Figure 13: The digital payments uptake pillar and its sub-indicators

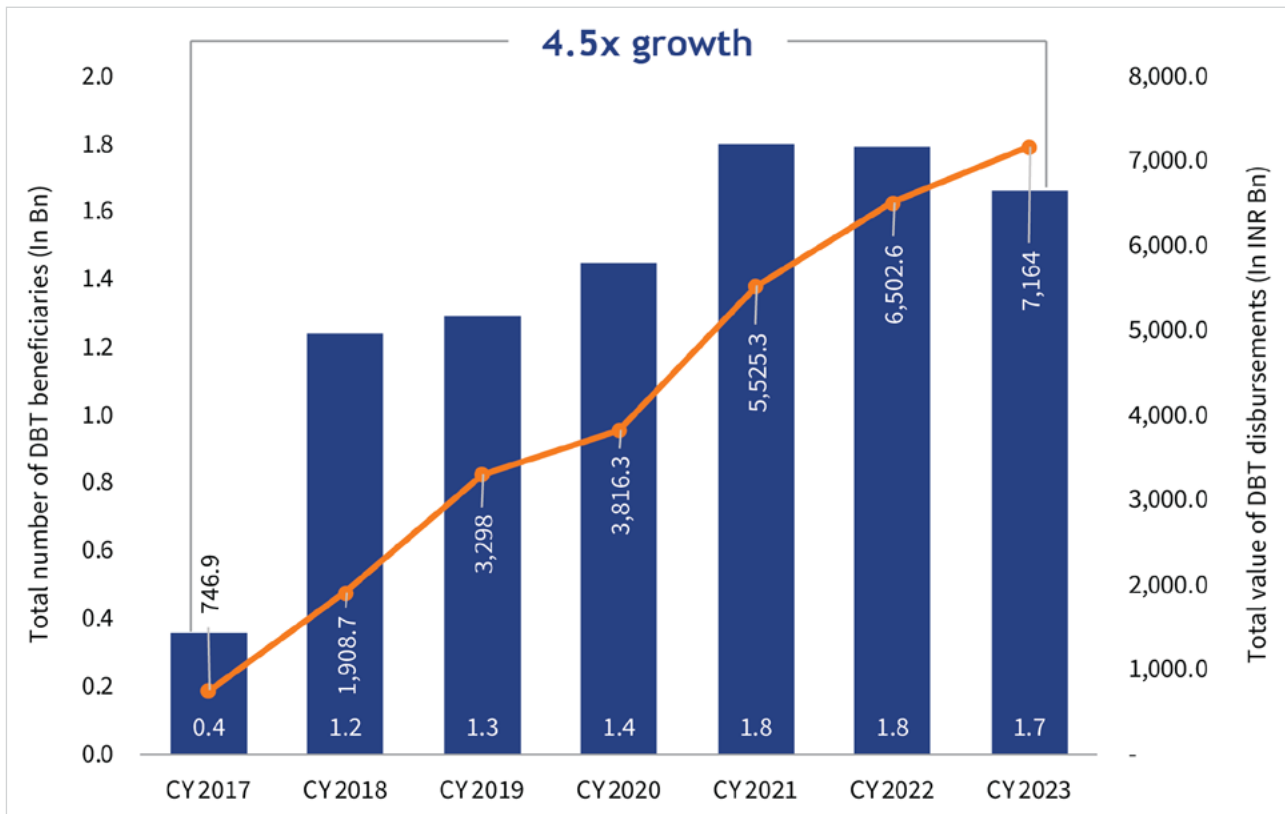




The growth of digital payments has also led to an increase in digital government disbursements, which has made it easier for customers to get subsidies and helped the government reduce leakages. The JAM Trinity supported the growth and conceptualization of DBT as it addressed the issues related to identification and provided a clean pipeline for the delivery mechanism. The development of the Aadhaar Payment Bridge enabled the government to create a strong pathway for DBTs. Aadhaar is used to identify the beneficiaries. The Aadhaar-linked bank accounts are used to transfer funds digitally. Finally, mobile phones provide a platform for individuals to access banking services.

Advancements in the digital payments ecosystem significantly enhanced the government’s capacity to identify and assist households in need during the COVID-19 pandemic, where 90% of households eligible for Direct Benefit Transfer (DBT) received aid after the lockdowns came into effect. This high rate of successful assistance demonstrates the robustness and reach of the digital payment infrastructure in times of crisis. *Aadhaar* authentication has helped tackle the issue of “ghost beneficiaries” and “identity theft” and ensured that the sum is transferred directly to the beneficiaries’ *Aadhaar*-seeded bank account.⁵⁶ The government estimates a fiscal savings of INR 2.7 trillion⁵⁷ as of March 2022 from DBT. These savings from DBT amount to **1.1%** of the GDP for 2021-22.⁵⁸

Figure 14: Growth in DBT numbers



The lending market is also one of the indicators to measure the extent of a formal economy effectively. Even before COVID-19, at least 92% of small businesses did not have access to the formal credit market.⁵⁹ Lately, as the overall digital payment sector has picked up, smaller and micro businesses have also started to adopt these digital modes of payment. The regulation by NPCI in 2018⁶⁰ supported merchant onboarding through its mandate for interoperability within the UPI ecosystem, which led to a revolution in digital payments. The merchant payments through UPI grew staggeringly at a CAGR of 83% since 2020.





Section 04

Impact of digital payments on user segments





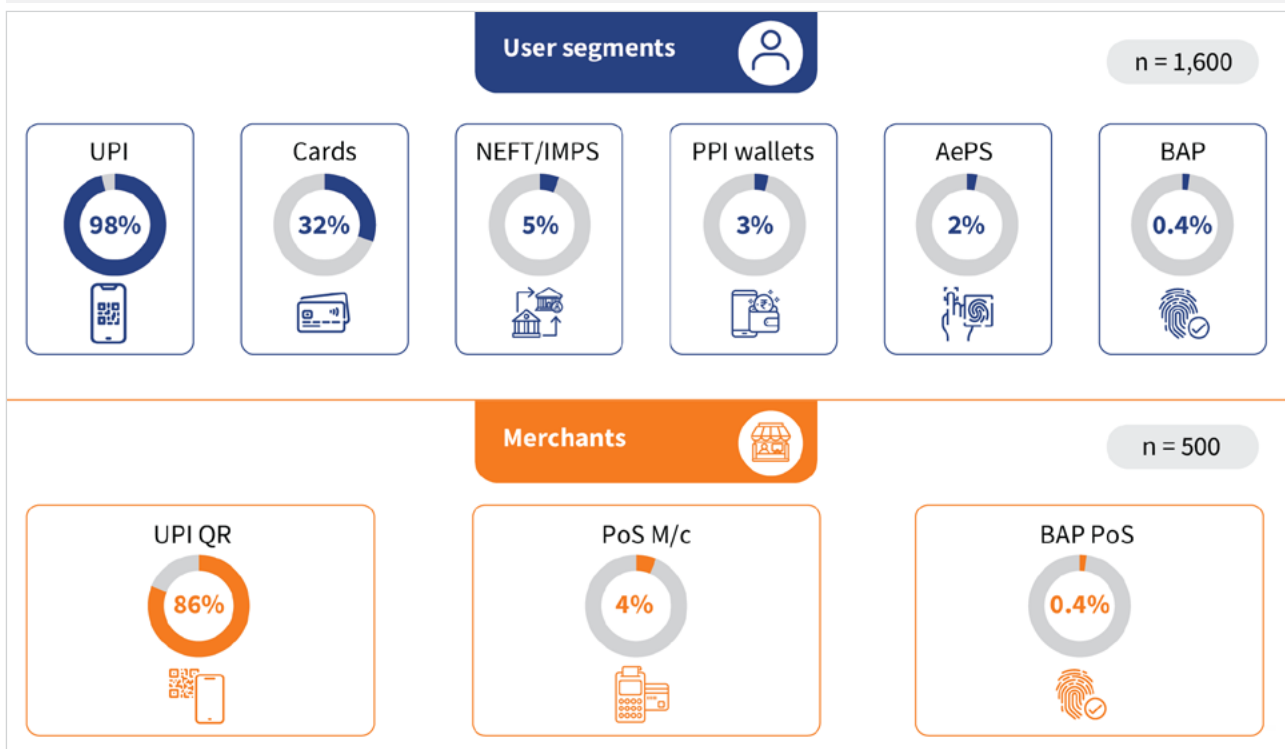
As of October 2023, India has around 300 million⁶¹ unique, active users of digital payment solutions, roughly 36% of the country’s adult population. These numbers align closely with the country’s digital literacy rate, which indicates that around 345 million⁶² adults possess digital literacy skills. While there has been a surge in regular users of digital payments over the past few years, the public and private sector needs to make concerted efforts to improve the adoption for the remaining 64% of adults and bridge the digital divide

MSC’s nationwide research selected a sample of 1,600 users and 500 merchants based on the selection criteria of being aware of the different digital payment solutions. The study revealed that 88% of the users who were aware of digital payment solutions also used digital payments along with cash for their transactions. The study also highlights that 91% of the males aware of digital payment solutions used these solutions regularly. In comparison, the figure is lower for female users at 81%. Additionally, the study indicates that respondents in rural areas are more aware of digital payments than those in urban areas by 13%; however, this doesn’t translate into active usage, primarily due to reliance on cash and lack of complete trust in digital payments.

Similarly, 85% of the merchants who were aware of digital payment solutions actively used different modes to receive payments digitally. These merchants prefer accepting payments via UPI QR codes followed by card payments (through PoS devices). However, BHIM Aadhaar Pay has lower acceptance due to the need for additional PoS infrastructure and the associated MDR, which acts as a deterrent. The remaining 15% of merchants who are aware of digital payments still prefer cash. This tendency is more pronounced among female merchants (24%) than males (13%).

The sections below cover the trends of user segments and merchants who are aware of digital payment modes and also use them.

Figure 15: Different digital payment modes being used by user segments and merchants

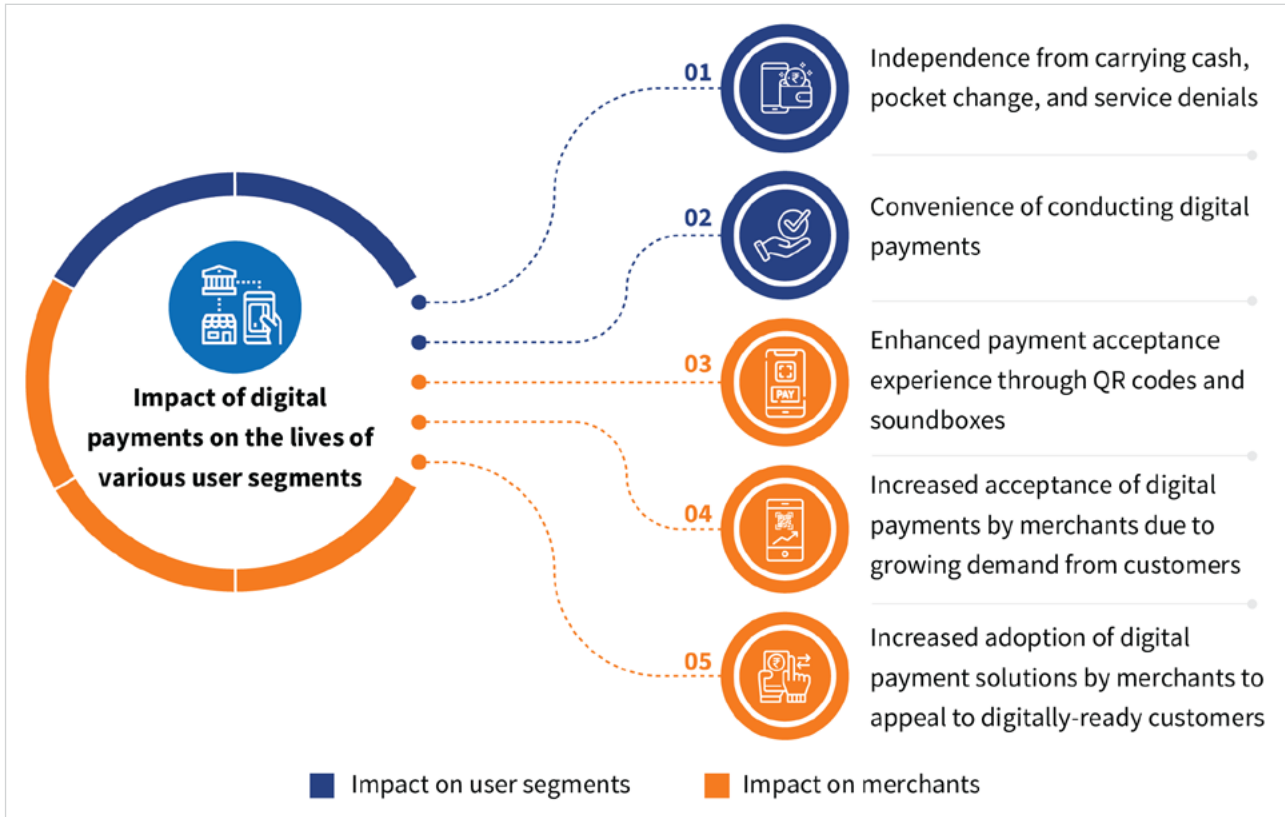


We synthesized insights from qualitative and quantitative research into a comprehensive analysis to assess the impact of digital payments on the quality of life for customers and merchants alike. We have defined this impact through an assessment of users’ needs, aspirations, and challenges and an evaluation of how products or services align with their overall well-being and enhance it. The focus has been to identify how the impact of digital payments has gone beyond financial transactions and eased the lives of users when compared to cash transactions.



4.1: Independence from carrying cash, pocket change, and service denials

Figure 16: Impact of digital payments on user segments' lives



User segments, including in rural areas, have shifted to digital payment modes, such as UPI, to transact at offline retail outlets. They appreciate the convenience of not needing to carry cash or exact change.⁶³ This shift is significant, given



people's historical reliance on cash due to a lack of digital payment infrastructure and limited merchant acceptance in rural geographies. Multiple user segments have now adopted digital payments to become more independent and less reliant on cash:

	<p>97% of older digital payment users face challenges in regularly accessing cash for P2M transactions due to their limited mobility and the need to visit ATMs or banking touch-points. Hence, they are the most impacted by the replacement of cash by digital payments for numerous use cases.</p>		<p>Approximately 95% of women who use digital payments, primarily homemakers, encounter logistical challenges when they try to access ATMs and banking touch-points. They often rely on other household members to withdraw cash, which can be inconvenient. Self-initiated digital payment methods provide them with a sense of independence.</p>
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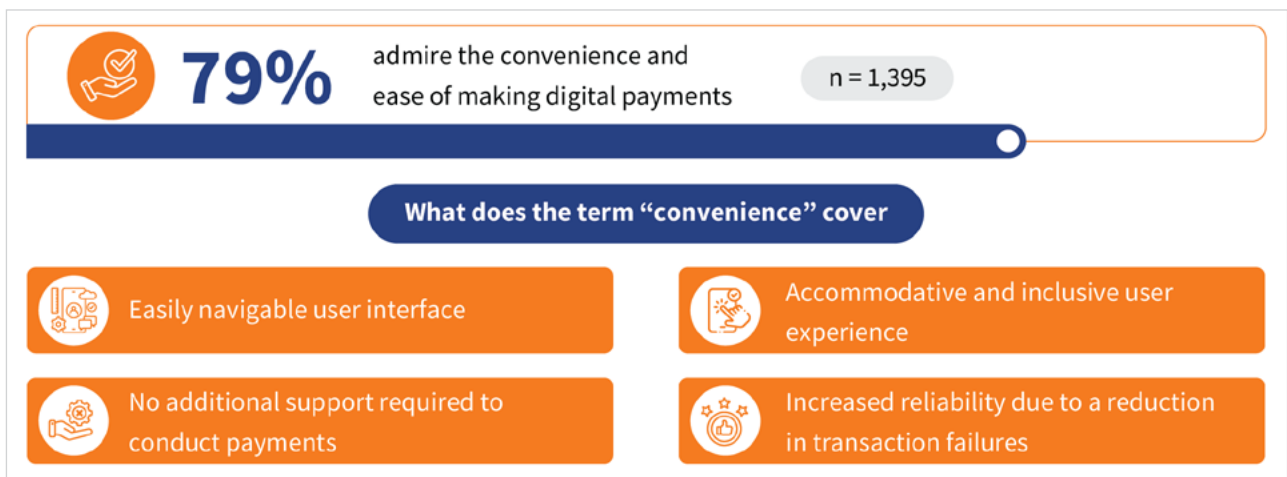
Digital payment modes, such as UPI, PPI wallets, and debit and credit cards, helped improve customer experience since they curbed issues related to petty cash or pocket change. Some key pocket change-related challenges that digital payments resolved are:

Figure 17: A merchant returning change in cash and toffees to a customer



- Customers were denied service⁶⁴ or sale of goods in the absence of exact change.
- Merchants resorted to handing out toffees⁶⁵ as replacements for pocket change.
- Merchants asked customers to reach out to other nearby merchants to convert high-denomination currency notes to smaller-denomination currency notes.

4.2: Enhanced user experience and convenience to conduct payment transactions



Digital payment methods, such as UPI, digital wallets (PPIs), and tap-to-pay features on debit and credit cards, have enhanced convenience for users as they provide easy and efficient modes of payment. These methods enable customers to perform quick, contactless, and remote P2X⁶⁶ transactions.



NFC chip-enabled credit and debit cards with tap-to-pay functionality enable users to pay at merchant PoS terminals without the need to enter a PIN. This significantly reduces the average transaction time to under 30 seconds.^{67,68} Users can seamlessly link their debit and credit cards to specific digital wallet apps on NFC-enabled smartphones or smartwatches.⁶⁹ Additionally, this integration allows for card payments without physical contact by simply placing their device near Point of Sale (PoS) terminals. Approximately 76% of respondents with debit and credit cards predominantly use the tap-to-pay feature provided by their cards. In comparison, around 6% of user segments have synchronized their cards with their NFC-enabled smartphones for such transactions. Moreover, due to merchants' widespread adoption of QR codes, approximately 96% of user segments in the study have embraced UPI as their primary digital payment mode for P2M transactions.

	In rural areas, 53% of digital payment users prefer digital modes over cash due to their convenience and versatility.
	Rural areas have seen a sustainable shift toward digital payments, with 27% of digital payment users who rely on digital models, such as UPI, PPI wallets, and cards, to handle most of their monthly expenses.

The study's findings also corroborate that UPI remains a key driver of digital payment adoption. This is because UPI makes remittances, bill payments, merchant payments, and availing of credit, among others, easily accessible and convenient to the masses, especially to the low- and middle-income segment.



My life has been so much easier since I learned that I can use my credit card without carrying my actual card. I have linked it to GPay. If merchants have an NFC-enabled PoS machine, I tap my phone on the device to conduct a transaction, and I do not even need to provide the PIN for a small transaction. Alternatively, if they do not have a PoS machine but a UPI QR, I can scan the code and pay through my RuPay credit card.



-Pritam Lokhande
Software Engineer, Maharashtra

4.3: Enhanced payment acceptance experience through QR codes and sound boxes



92%

of merchants started to accept digital payments owing to their convenience

n = 512

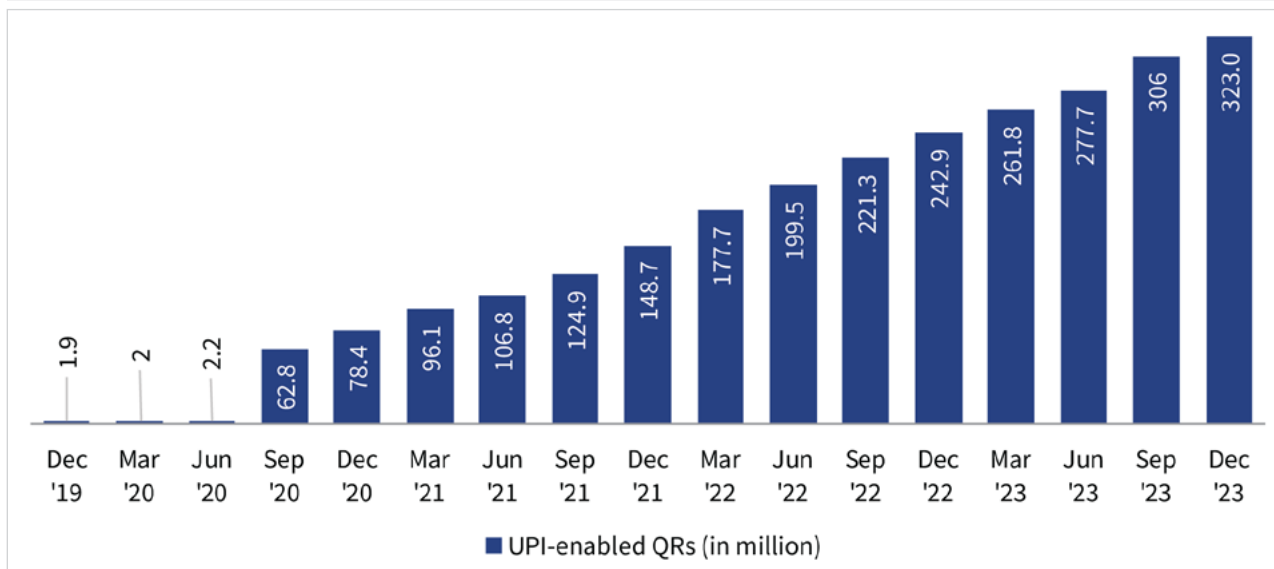
Most merchants presently find the digital payment acceptance process seamless, which has eliminated the need to constantly monitor inward transactions on their mobile phones or personal computers. Notably, many merchants attributed the improved convenience to UPI QR. QR codes provide a cost-effective and interoperable platform for payment acceptance and enable customers to execute digital transactions effortlessly by scanning the code through any UPI application to complete the payment process.



QR technology has advanced significantly to offer merchants the option to acquire a “QR sound box.” This device allows merchants to view the transaction status and the received amount after each successful transaction and streamlines the merchant’s experience. This eliminates the need for merchants to check their mobile phones repeatedly for payment confirmations. Merchants can access this device by paying a monthly rental fee of INR 125.⁷⁰ About ~14 million⁷¹ of these sound boxes are in use at merchants’ points of sale out of 6 million merchant QR codes.

	<p>94% of rural merchants who accept digital payments reported a significant improvement in their payment collection process. They now receive payments directly in their bank accounts, which has eliminated the need to deposit cash regularly in the bank branch.</p>		<p>84% of merchants with high daily footfalls (100-200 customers or more) prefer UPI QR as their payment collection method. They appreciate its convenience and the reduced need for human involvement to verify the transaction status for payments received over UPI.</p>
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Figure 18: UPI QRs currently deployed at merchants’ points of sale



“Nowadays, I do not have to stop work and constantly check my phone for transaction success after a UPI payment. My soundbox narrates all the necessary details so I can continue to manage my stall without getting distracted.”

-Mohan Mondal
Street vendor, West Bengal



4.4: Merchants have pivoted to accept digital payments due to demand from customers



87%

adopted digital payments as they were nudged to accept this mode

n = 512

The convenience and simplicity of digital payments have been pivotal to drive customer adoption, which has led to increased customer demand to conduct digital transactions at offline retail outlets. Nearly 9 out of 10 merchants revealed that their customers urged them to opt for card or QR code payments, following the cash shortage at ATMs and bank branches after the demonetization in 2016. The issuance of high-denomination currency notes, especially the INR 2,000⁷² note, created challenges, which led to minor friction between merchants and customers.

Our findings show that approximately 30% of merchants who accept card payments requested banks to provide PoS machines shortly after demonetization was implemented. They did so to address the challenges that emerged from the scarcity of smaller denomination notes, which led to lower-than-usual sales despite the one-time onboarding costs and the merchant discount rate (MDR). Subsequently, around 24% of the merchants in the study registered for UPI shortly after its launch to overcome the cash shortage and change management issues.



86% of rural merchants were encouraged by their customers to adopt UPI QR payments, as they had observed its use with urban merchants and heard about it from their social circles.



Even female merchants felt the need to accept digital payments, and 88% of them adopted UPI QR due to motivation from their customers.



During the COVID-19 pandemic, UPI became essential for my business. Previously, customers paid for groceries in cash, but when the neighborhood was quarantined, my business suffered. A friend suggested accepting digital payments via UPI, which proved to be a game-changer. Since then, I have been sharing my QR code with customers on WhatsApp, which has allowed them to pay remotely and safely.



-Gopal Swain
Retail merchant, Odisha

4.5: Merchants have adopted digital payments to showcase savviness, inclusivity, and digital readiness



84%

feared their customers may be pushed away if they did not accept digital payments

n = 512



Between demonetization and the onset of COVID-19, approximately 26% of the study’s merchants adopted digital payments and began to accept payments through cards and UPI. The remaining merchants cautiously observed the digital payments landscape and found that their customers gravitated toward competitors and other merchants that accepted digital payment methods. This fear of missing out (FOMO) also motivated the remaining merchants to begin accepting digital payments.

86%

of merchants in the study considered UPI QRs to be convenient, cost-effective, highly in demand among customers, and widely accepted across an array of merchants, among other motivating factors. This has made UPI QRs the most popular digital payments acceptance infrastructure among merchants, especially for informal merchants or roadside vendors.


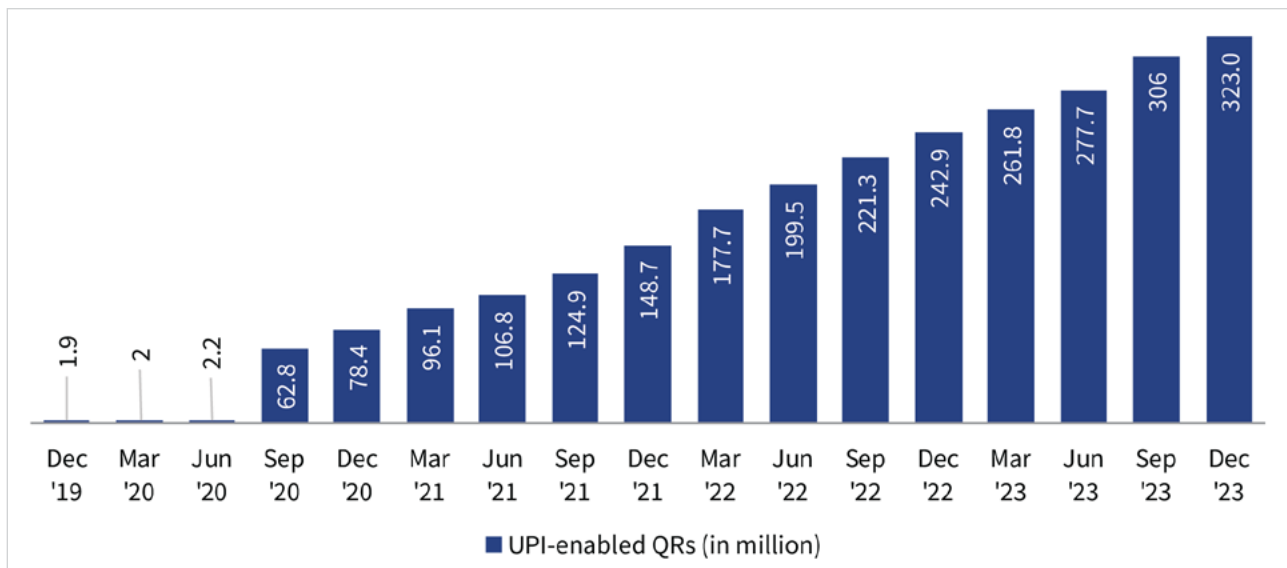


Figure 19: Primary drivers for merchants to start accepting digital payments



Out of 63% of the merchants in the study, most informal merchants or roadside vendors (85%) started to accept digital payments, specifically UPI,⁷³ immediately after the initial wave of the COVID-19 pandemic. This was majorly a result of customers pivoting toward contactless payment modes, such as UPI and PPI wallets.



PM SVANidhi has accelerated the adoption of digital payments with street vendors

India has about 6 million street vendors, with the largest concentrations in Delhi, Mumbai, Kolkata, and Ahmedabad. These street vendors conduct approximately 3 billion monthly transactions (mostly inward transactions with an average ticket size of INR 87), cumulatively worth INR 276 billion.

A recent study by MSC revealed that overall, approximately 47% of street vendors have actively adopted digital payments to conduct inward and outward transactions. This is mostly visible among youth and young adults, followed by middle-aged merchants. For youth and young adult merchants especially, digital payments account for up to 60% of their total inward transactions. This has been a result of customer actively pushing merchants to accept digital payments, coupled with merchants' willingness to adopt the digital payments ecosystem, which showcase their inclusivity and digital-readiness.

PM SVANidhi



74, 75





Section

05

Initiatives for digital payments





In line with the DIGIDHAN Mission’s objectives, many private and public players launched initiatives, product adjustments, and programs that propelled the adoption of digital payments. From both the demand and supply sides, stakeholders have identified gaps and friction points that deter users or merchants from using digital payments. These initiatives have taken shape to either generate awareness among the masses, improve access for merchants and users, or accelerate usage by new and existing users of digital payments.

Figure 20: Focus areas of initiatives undertaken after the DIGIDHAN Mission’s launch



In this section, we dive deep into these work areas and study how stakeholders have approached these subjects and the change they have created through their targeted initiatives.

5.1: Initiatives to generate awareness of digital payments

The second Financial Literacy and Inclusion Survey held in 2018-19 found that only **27% of Indians⁷⁶ were financially literate**, with the urban-rural split being 33% in urban regions and 24% in rural areas. The generation of awareness among users and merchants has been a key focus area for the growth of digital payments in India and the DIGIDHAN Mission. The table below summarizes key initiatives undertaken by the government, allied bodies, and private players to cement awareness of digital payments among various target segments.





Initiatives by government and allied bodies		
Stakeholder name	Initiative	Outcome
Reserve Bank of India (RBI)	<p>1. Har Payment Digital (2023)</p> <p>During Digital Payments Awareness Week (DPAW), RBI launched this mission, which was themed “Digital Payment <i>Apnao, Auron ko bhi Sikhao.</i>”⁷⁷ This initiative emphasized the convenience and security of digital payments and urged stakeholders to adopt and promote them.</p> <p>2. Electronic Banking Awareness and Training (e-BAAT)</p> <p>From 2019, the RBI has conducted periodical e-BAAT programs to create awareness of digital payments on topics, such as safe practices while using digital payment products, GRM,⁷⁸ etc.</p> <p>3. ‘RBI Kehta Hai’</p> <p>RBI also conducts 360-degree, multimedia channel / platform based public awareness campaigns under the tag of ‘RBI Says’ or ‘RBI Kehta Hai’ to create awareness among members of public about various digital payment initiatives that cover customer’s safety, security and convenience.</p>	<p>1. Har Payment Digital</p> <p>UPI transactions increased by 15.27% in March ’23⁷⁹ compared to February ’23.</p> <p>2. e-BAAT</p> <p>Till December 2023, 1,322 e-BAAT programs⁸⁰ have been conducted.</p> <p>3. ‘RBI Kehta Hai’</p> <p>Awareness modules and videos on about 28+ topics ranging from safeguards for digital banking facilities, digital payment frauds, etc. are aired to maximise the reach of these modules and retention by the public about digital banking and payments best practices.</p>
Ministry of Home Affairs (MHA)	<p>1. Vani: CyberDost by the Indian Cybercrime Coordination Centre (I4C)</p> <p>The I4C launched a CyberDost handle on various social media platforms to generate cyber awareness among citizens. It also launched chatbot Vani: CyberDost under the NCCRP website and floated content through SMSs.</p>	<p>1. Vani: Cyber Dost</p> <p>Reporting of cybercrime has been increasing every year; it witnessed a rise of 113% from 2021 to 2022.⁸¹</p>
Data Security Council of India (DSCI)	<p>1. Digital Payment Suraksha</p> <p>The campaign has two key aspects: The “Digital Payment Security Awareness Campaign,” which disseminates multilingual content on secure digital payment methods, and the “Digital Payment Security Alliance,” which concentrates on policy discussion and best practices for digital payment security.</p>	<p>1. Digital Payment Suraksha</p> <p>The campaign has reached more than 10,000+ people through YouTube videos and podcasts⁸² till January 2024 and enhanced public knowledge and trust in digital transactions.</p>



<p>Ministry of Electronics and Information Technology (MeitY)</p>	<p>1. DigiShala</p> <p>“DigiShala” is a dedicated TV channel that promotes digital payments⁸³ and targets the rural and poor segments through multilingual resources.</p> <p>2. PMGDisha</p> <p>Launched in 2017, it sought to bridge the digital divide by imparting digital skills through multilingual content and 20-hour training modules, with a special emphasis on digital payments.</p> <p>3. Campaigns launched at the Azadi ka Digital Mahotsav</p> <p>The “Digital Payments Utsav” campaign sought to promote the growth of the digital economy and financial inclusion. The campaign also initiated the “Digital Payment Sandesh Yatra,” a national tour to educate citizens about digital payment security, and launched the “<i>Chutki Baja Ke</i>” anthem.</p> <p>4. DigiVAARTA</p> <p>Launched in September 2018, the campaign used the CDFI’s <i>Samwad</i> platform to improve financial literacy and used content that is also accessible via SMS. It also engaged users with interactive multilingual content.</p> <p>5. Digital Payment Awareness Campaign</p> <p>Launched in 2016, through this campaign, the National Institute of Electronics & Information Technology (NIELIT) sought to increase understanding and awareness of digital payment modes and provide training and hands-on support for a clear grasp of digital payment processes. These workshops helped focus on the creation of a cashless society⁸⁴ in India.</p>	<p>1. DigiShala</p> <p>With a dedicated target base of 20 million families, the Doordarshan channel has continued to broadcast the content in periodic cycles⁸⁵ throughout the year since 2016.</p> <p>2. PMGDisha</p> <p>As of January 2024, the program has enrolled more than 73.6 million candidates and trained 63.5 million candidates since its inception.</p> <p>3. Azadi ka Digital Mahotsav</p> <p>The campaign incentivized stakeholders, such as banks and payment aggregators, etc., through the DIGIDHAN awards to continue to promote digital payments.</p> <p>4. DigiVAARTA</p> <p>Since its inception, more than 64 million SMS messages have been sent through its short code “14444”.</p> <p>5. Digital Payment Awareness Campaign</p> <p>Within a year of its launch, NIELIT conducted 15 workshops in more than 14 locations.⁸⁶</p>
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Initiatives by private players

Stakeholder name	Initiative	Outcome
Paytm	<p>1. The “G20-Stay Safe Online”⁸⁷ campaign in collaboration with MeitY (2023)</p> <p>The campaign promotes cyber hygiene and security by educating the masses about online risk and safety measures through its website.⁸⁸</p>	<p>1. G20-Stay Safe Online</p> <p>From February 2023 to September 2023, more than 24 physical participatory workshops,⁸⁹ sessions, online quizzes, and competitions were conducted nationwide.</p>
Google Pay	<p>1. NASSCOM’s Data Security Council of India (DSCI) and Google Pay launched the “Digital Payment Abhiyan” in collaboration with MeitY (2019)</p> <p>The campaign aimed to educate customers on the benefits of making digital payments and urge them to adopt security and safety best practices.</p>	<p>1. Digital Payment Abhiyan</p> <p>The Google India YouTube channel has 38 videos on digital payment modes, which reached 500+ million views by January 2024.</p>
HDFC Bank	<p>1. Parivartan is the umbrella brand for the social efforts of HDFC Bank:</p> <p>Financial inclusion and literacy are <i>Parivartan’s</i> key pillars. It promotes mobile financial literacy programs across rural India through an audio-visual format.</p> <p>2. Vigil Aunty is HDFC’s awareness initiative targeted at cybersecurity and fraud prevention:</p> <p>Launched in January 2023, the bank runs a customer safety campaign, Vigil Aunty, on cyber vigilance that employs thematic educational videos across social platforms. It also uses robust technologies, such as wrapper technology, to make transactions more secure for customers</p>	<p>1. Parivartan</p> <p>2.4+ million financial literacy camps⁹⁰ were organized till March 2023 to benefit 17.6+ million individuals.</p> <p>2. Vigil Aunty</p> <p>Within six months, it reached 146 million people and led to the shutdown of 82,692 fake profiles and 1,500 counterfeit links.</p>
State Bank of India (SBI)	<p>1. Mission Uniting Bharat</p> <p>This mission focuses on awareness of financial products and electronic payment systems and provides credit counseling to rural customers through its centers.</p>	<p>1. Mission Uniting Bharat</p> <p>In 2023, 38,162 camps⁹¹ were conducted under the mission, in which 1.25 million people participated.</p>



National Payments Corporation of India (NPCI)

1. DigiSaathi

Under a joint initiative with payment system operators and participants (banks and non-banks), NPCI launched a **24x7 helpline** in March 2021⁹² that assists users with information on digital payment product and service through multilingual automated responses. It also has a [website](#) and [chatbot](#) to assist users with their queries.

2. “UPI Chalega 3.0”

Launched in January 2023, the campaign’s objective was to enhance the adoption of UPI as a preferred method for digital transactions.⁹³ The campaign employs diverse media channels for a wide reach. It uses its [website](#) as a key resource to promote the ease of UPI services.

1. DigiSaathi

DigiSaathi helps enhance digital payment adoption through ready information and boosts user confidence.

2. UPI Chalega 3.0

The ad was viewed 700+ million times and reached to 370+ million audience by January 2024.





The following case study elaborates on how the PMGDisha program by the HRD division under MeitY has achieved significant milestones to generate awareness of digital payments in the rural sector.




PRADHAN
MANTRI GRAMIN
DIGITAL SAKSHARTA
ABHIYAN

Har Ghar e-Sakshar PMGDISHA

PMGDisha: A pivotal initiative in India's digital transformation journey

Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDisha) sought to bridge the digital divide in rural areas. Its focus was to impart essential digital skills, especially in digital payments, which aligned with India's DIGIDHAN mission.



Reach: Out of the **73.6 million participants**, 86.3% completed the training process and 64.5% were certified.



Modules: 20% of the content is based entirely on digital payments.



Language: The content was shared in 23 Indian languages.



Assessment: The impact was measured by conducting a one-hour online examination of the participants.

13% Regular monitoring and field-level implementations through Common Service Centers (CSCs) led to **low dropout rate.**



57% **36.5 million women** participated in the program, which bridged the gender gap in digital proficiency.



Why PMGDisha worked out

PMGDisha included 20-hour video-based modules that participants could watch at their preferred pace, which gave them ample freedom to manage the course alongside their daily routines. However, PMGDisha's success rate can be largely attributed to its strategic implementation in collaboration with field-level partners, such as CSCs. These implementing partners allowed the scheme to facilitate live sessions for participants to clarify doubts with tutors, organize IT labs for the segment that cannot afford smartphones, conduct exams, and run constant progress check-ins with those on-ground.



5.2: Initiatives to improve the accessibility of digital payment products

By 2022, more than **52% of Indians had access to the Internet and used it actively**.⁹⁴ Various financial service providers took advantage of this target segment and sought to increase access to digital payments. The increased access resulted in more than **45% of the active internet user base using digital payments**. While ecosystem-driven factors, such as COVID-19, contributed to this growth, several government bodies and private financial service providers also launched targeted initiatives to improve the accessibility of digital payment products.

Initiatives by government and allied bodies		
Stakeholder name	Initiative	Outcome
Reserve Bank of India (RBI)	<p>1. Payment Infrastructure Development Fund (PIDF)</p> <p>The RBI established PIDF in June 2020⁹⁵ to expand the payment infrastructure in underserved areas. It sought to enhance the deployment of physical devices, such as Point of Sale (PoS) terminals, mPoS, GPRS, and digital devices, such as QR codes.</p> <p>2. Village Adoption Programme (VAP)</p> <p>Launched during the Digital Payments Awareness Week 2023, the program⁹⁶ is set to transform 75 villages digitally by enhancing digital payment literacy and infrastructure.⁹⁷ Under the programme, awareness camps / activities were conducted in 75 villages spanning across 20 States in the country. Apart from conducting awareness activities in these villages, around 1,900 merchants have been onboarded across these villages.</p>	<p>1. PIDF</p> <p>By November 2023, 820,901 physical and 27,195,902 digital devices⁹⁸ were deployed.</p> <p>2. Village Adoption Programme</p> <p>More than 150,000 villagers⁹⁹ have benefitted from the initiative within 2023 itself.</p>
Ministry of Housing and Urban Affairs (MoHUA)	<p>1. PM SVANidhi</p> <p>Launched in June 2020, the scheme improved access to credit for street vendors through working capital loans up to INR 10,000.¹⁰⁰ It also helped widen the digital payments acceptance infrastructure by incentivizing digital transactions for street vendors.</p>	<p>1. PM SVANidhi</p> <p>As per the MSC study conducted for MoHUA, street vendors are estimated to conduct 3.03 billion digital transactions per month, out of which 20% are done by PMSVANidhi vendors.</p>



<p>State Bank of India</p>	<p>1. Provision of e-UPI prepaid vouchers</p> <p>During FY2023, SBI Payments facilitated the acceptance of e-UPI prepaid vouchers through the YONO SBI Merchant application (SoftPoS) for DBT projects initiated by many state governments.</p> <p>2. MasterCard’s partnership with SBI payments to boost digital payments’ acceptance infrastructure</p> <p>The initiative seeks to simplify transactions for micro-merchants and consumers through a seamless and secure payment mode in 2022, with a focus on non-metro and Tier-2 cities.</p>	<p>1. Provision of e-UPI prepaid vouchers</p> <p>The vouchers improved access to government DBT projects.</p> <p>2. Mastercard-SBI payments</p> <p>Within 2022, the on-ground engagements had 130,000+ attendees, and 50,000+ micro-merchants started their digital journeys.</p>
<p>National Payments Corporation of India (NPCI)</p>	<p>1. Product-level tweaks to UPI</p> <p>To cater to the segment which has a feature phone or faces difficulty using a smartphone or has limited or no access to the internet, NPCI launched “UPI 123Pay,” which enabled UPI payment option via an IVR Call or Feature phone based payment application.</p> <p>The feature also offers <i>Aadhaar</i> based onboarding for users without a debit card.</p> <p>2. Linkage of RuPay credit cards to UPI</p> <p>This initiative eliminates the high costs associated with credit card transactions by enabling payments through UPI’s QR code system. It broadens credit accessibility for merchants and simplifies payment consolidation for consumers.</p> <p>3. The global reach of UPI:</p> <p>UPI has expanded globally¹⁰⁴ to target the countries that send the most remittances back home to India. This has helped make digital payments, especially remittances, more seamless and convenient in these countries.</p>	<p>1. Product tweaks to UPI</p> <p>Such product tweaks propelled 10 billion monthly UPI transactions¹⁰⁵ in 2023.</p> <p>2. Linkage of RuPay credit cards to UPI</p> <p>After the launch of this initiative in Aug 2023, the number of active credit cards witnessed a 17% YoY jump from 2022, at 91.3 million¹⁰⁶ RuPay cards have also gone global with their presence in Nepal, Bhutan, Singapore, UAE, Maldives, and Mauritius.</p> <p>3. Global reach of UPI:</p> <p>NIPL and the RBI have partnered with financial bodies in more than 30 countries¹⁰⁷ to extend UPI transactions internationally. By 2023, UPI was present in Nepal, Bhutan, Singapore, UAE, Mauritius, and France.</p>



The following case study deep dives into how one of India's leading banks, HDFC Bank, contributed to the payment acceptance infrastructure. The case study also looks at how HDFC encouraged various target segments to use digital payments through improved access to digital payments, especially for the rural and low-income segments.



Embracing digital innovation: HDFC Bank's transformation in the digital payments ecosystem



HDFC Bank's technology investment has led to advanced digital services, such as intuitive mobile apps and effective online platforms, which serve more than **71 million customers with 93% of transactions conducted digitally**. The adoption of digital solutions has streamlined banking operations, improved customer experience, and reinforced the bank's dominance in India's digital payments landscape.

A snapshot of HDFC's strides in improving access



PoS device expansion: HDFC leads in active PoS machines, which has enhanced digital payment acceptance, including in-flight access through a partnership with Indigo.

Consumer support: The bank maintains a high resolution rate within targeted TAT for various service categories, backed by a well-trained assistance channel.

Offline Pay: HDFC collaborates with the RBI to enhance digital payments access in low or no network areas through a prepaid wallet platform.

HDFC Bank offers 275+ services on Net Banking and 250+ services at fingertips through its mobile banking app.



The bank was the first to digitize credit cards and the fixed deposit ecosystem at scale.



Start to the new year: India's first bank to issue 20 million credit cards!



HDFC Bank started its credit card business in 2001, and reached its **first 10 million cards** in 16 years. However, it doubled this figure in less than half of that duration and reached 20 million credit cards by January 2024. As the largest card issuer that holds more than a quarter of the market share, the bank continues to work toward its digitization goal through various initiatives in technology and infrastructure and by ensuring financial inclusion in low-access areas.



5.3: Initiatives to increase the usage of digital payment products

Initiatives to grow users' awareness and build bridges to improve access have been significant drivers to acclimatize users and merchants to the digital payment ecosystem. Financial service providers and the government have worked tirelessly to push the repeat usage of digital payments in a user's life to build user habit and trust. The table below summarizes some key initiatives undertaken by government and financial service providers to drive usage among users.

Initiatives by government and allied bodies		
Stakeholder name	Initiative	Outcome
Ministry of Finance	<p>1. Zero-MDR initiative</p> <p>Starting 2020,¹⁰⁸ the policy removed transaction charges for RuPay and UPI platforms and promoted the shift to convenient, quicker digital payments over traditional methods.</p>	<p>1. Zero-MDR initiative</p> <p>The policy encouraged digital payment¹⁰⁹ usage. Acquiring banks deployed 2.9 million PoS terminals in 2020, up almost 95%¹¹⁰ from the preceding year.</p>
Reserve Bank of India	<p>1. 24x7x365 availability of NEFT</p> <p>In December 2019, NEFT payments were made available 24x7 all-round the year. The introduction of 24x7x365 availability significantly elevated the system's convenience and accessibility, allowing for anytime payments.</p> <p>2. 24x7x365 availability of RTGS</p> <p>A similar initiative was taken for RTGS payments to be operational 24x7 in December 2020, with the objective of encouraging digital payment usage.</p>	<p>1. 24x7x365 availability of NEFT</p> <p>From CY 2020 to 2023, NEFT transaction volume witnessed an impressive rise from 294.63 crore to 658.71 crore and achieving a CAGR of 22.22 per cent. The transaction value experienced a substantial growth, of nearly 1.5 times from ₹238.49 lakh crore to ₹373.13 lakh crore registering a CAGR of 11.83 per cent.</p> <p>2. 24x7x365 availability of RTGS</p> <p>The volume of RTGS increased from 20.03 crore in CY-2021 to 26.05 crore in CY-2023, with a compound annual growth rate (CAGR) of 9.14 per cent. The value of RTGS transactions, on the other hand, increased from ₹ 1246.27 lakh crore in CY-2021 to ₹ 1641.75 lakh crore in CY-2023, with a CAGR of 9.62 per cent.</p>



Ministry of Petroleum and Natural Gas (MoPNG)	<p>1. Initiatives for consumers and OMCs to make payments digitally</p> <p>Three initiatives were launched to boost digital payments in fuel transactions: Cashback on digital fuel purchases at OMC pumps, discounts on online LPG refills, and OMC loyalty programs. These initiatives offer immediate financial benefits and encourage the shift toward regular use of digital payments in the fuel sector.</p>	<p>1. Initiatives for consumers and OMCs to make payments digitally</p> <p>The MoPNG has effectively driven a shift in consumer behavior, which can be reflected by the fact that 40% of petrol pump customers¹¹¹ paid digitally in 2022. However, this percentage saw a dip after withdrawing the INR 2,000 notes.</p>
Ministry of Electronics and Information Technology (MeitY)	<p>1. BHIM incentive programs for banks</p> <p>MeitY launched a program in 2023 to incentivize banks to promote low-value digital transactions via RuPay and BHIM-UPI. It sought to make daily digital payments more cost-effective and user-friendly.</p>	<p>1. BHIM Incentive schemes for banks</p> <p>The one-year initiative, backed by a financial outlay of INR 26 billion¹¹² in 2023, promoted the adoption of UPI Lite and UPI 123PAY.</p>

Initiatives by private players		
Stakeholder name	Initiative	Outcome
Bharat Bill Pay (BBPS)	<p>1. One platform, multiple bills:</p> <p>BBPS, a Digital Public Infrastructure dedicated to democratizing and digitizing bill payments in India has 21,600+ billers onboarded on its platform and is enabled on the leading Fintech and Banking Mobile Apps and other Customer Touch Points such as Website Portals, Bank Branches etc.</p> <p>2. Inward, cross-border remittances through BBPS</p> <p>In September 2022, BBPS launched cross-border inward bill payments. This move allowed BBPS to provide the cross border inward bill payment services to the NRIs across different countries¹¹³.</p>	<p>1. One platform, multiple bills</p> <p>BBPS grew at a CAGR of 72% by volume from 2017-18 to 2022-23.¹¹⁴</p> <p>2. Inward, cross-border remittances through BBPS</p> <p>This allows more than 30 million¹¹⁵ NRIs to pay their Indian tax and utility bills directly each year.</p>
National Payments Corporation of India (NPCI)	<p>1. AutoPay</p> <p>The NPCI's UPI AutoPay feature allows customers to set up payment mandates up to INR 15,000,¹¹⁶ with higher limits for some categories (mutual funds, Credit card bill payments, insurance upto 1 lakh). The feature's integration into major payment apps has fueled this growth and able to perform more than 50 million execution on monthly basis.</p> <p>2. National Electronic Toll Collection (NETC) program</p> <p>NPCI's FASTag technology is key to the digitization of toll payments in India. This shift is evident with increased FASTag transaction volumes and indicates wider acceptance of digital payments for daily travel.</p>	<p>1. AutoPay</p> <p>With NPCI's recent mandate to increase the transaction limit to INR 100,000, AutoPay now accommodates a wider array of payments.</p> <p>2. National Electronic Toll Collection (NETC) program</p> <p>Till Jan 2024, more than 82.7 million FASTags¹¹⁷ had been issued. The enhancement of transaction limits and inclusion of various payment categories for FASTag¹¹⁸ has added new use cases for digital payments.</p>



The following case study provides an in-depth analysis of PhonePe's impact on digital payments usage and its role to promote the adoption of such payments across different demographic groups, with a particular focus on rural communities.



PhonePe: A market leader in UPI payments



PhonePe has become a pivotal force that has increased UPI payment usage in India, especially with its **strategic expansion into rural merchants**. The PhonePe app goes beyond facilitating payments to integrate various other financial services for a broader user segment. This approach has made PhonePe the leader with **46% of the UPI market share** as of CY2023. Its commitment to inclusive merchant onboarding is evident, with more than 37 million merchants and a user base of 500 million as of November 2023.

PhonePe innovations: Enhancing digital transactions and expanding market reach



Merchant's face on the QR code: PhonePe introduced customized QRs that feature the merchant's face within the code's dots, to ensure the QR codes are not tampered.

SmartSpeakers: PhonePe distributed more than 20 million SmartSpeakers within six months of 2023 to enable wider acceptance by smaller merchants and drive usage.

Pincode: The app uses ONDC to link online consumers with local stores, and enhances digital payments in India through easy online ordering and offline familiarity.

Rural expansion: PhonePe's rural partnerships target areas with under 100,000 people, and onboards locals as representatives to drive digital payment usage by ensuring sustainable incomes.

Expanding digital engagement: PhonePe's pan-India approach



Regional expansion and tapping into tier 3 and below towns to cover **more than 99% of all Indian pin codes**

Streamlining operations and GRM through a digital self-service for merchants to raise tickets

Open channel for merchant onboarding across all business types via field staff or the self-initiated mode

Increasing popularity through **celebrity voice integration** in SmartSpeaker audio alerts

PhonePe: Simplifying digital payments for everyone



PhonePe's success story can be accredited to its simplified app experience for merchants and users, which has added to the convenience of digital payments. This was reflected on the field, as a user in Ahmedabad suggested:

"The widespread availability of UPI through PhonePe and integration of BBPS and ONDC onto the platform has simplified the hassle of bill and utility payments forever!"



Section

06

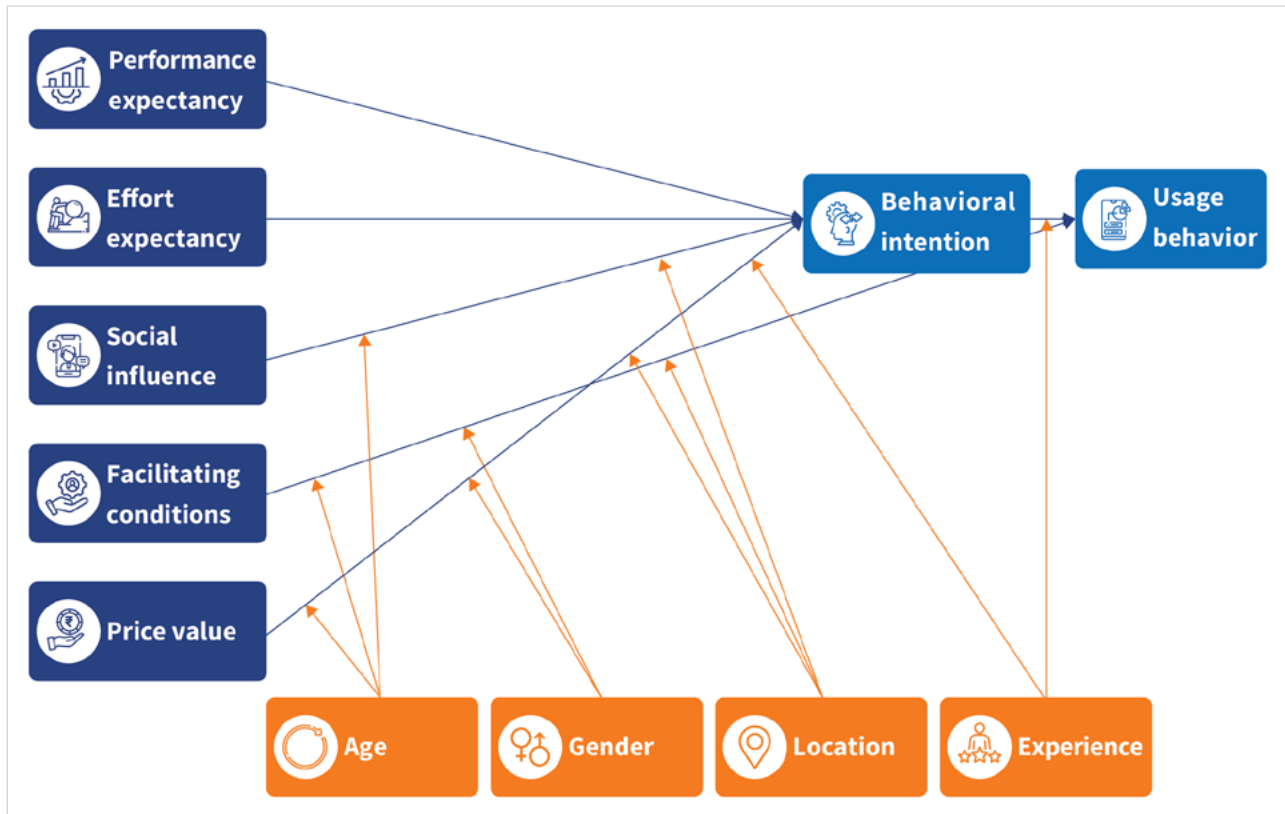
Drivers for digital payments' uptake





We collected and analyzed qualitative and quantitative data from various users and merchants nationwide to identify the drivers of digital payment adoption. This data was then assessed through the “Unified Theory of Acceptance and Use of Technology-II¹¹⁹” (UTAUT-II) model, which was adapted for our needs to capture the change in the usage behavior in digital payments for multiple user segments.

Figure 21: Unified Theory of Acceptance and Use of Technology -II framework



The model highlights the key factors that influence user attitudes toward digital payments and provides empirical insights into the impact of digital payments on user segments.

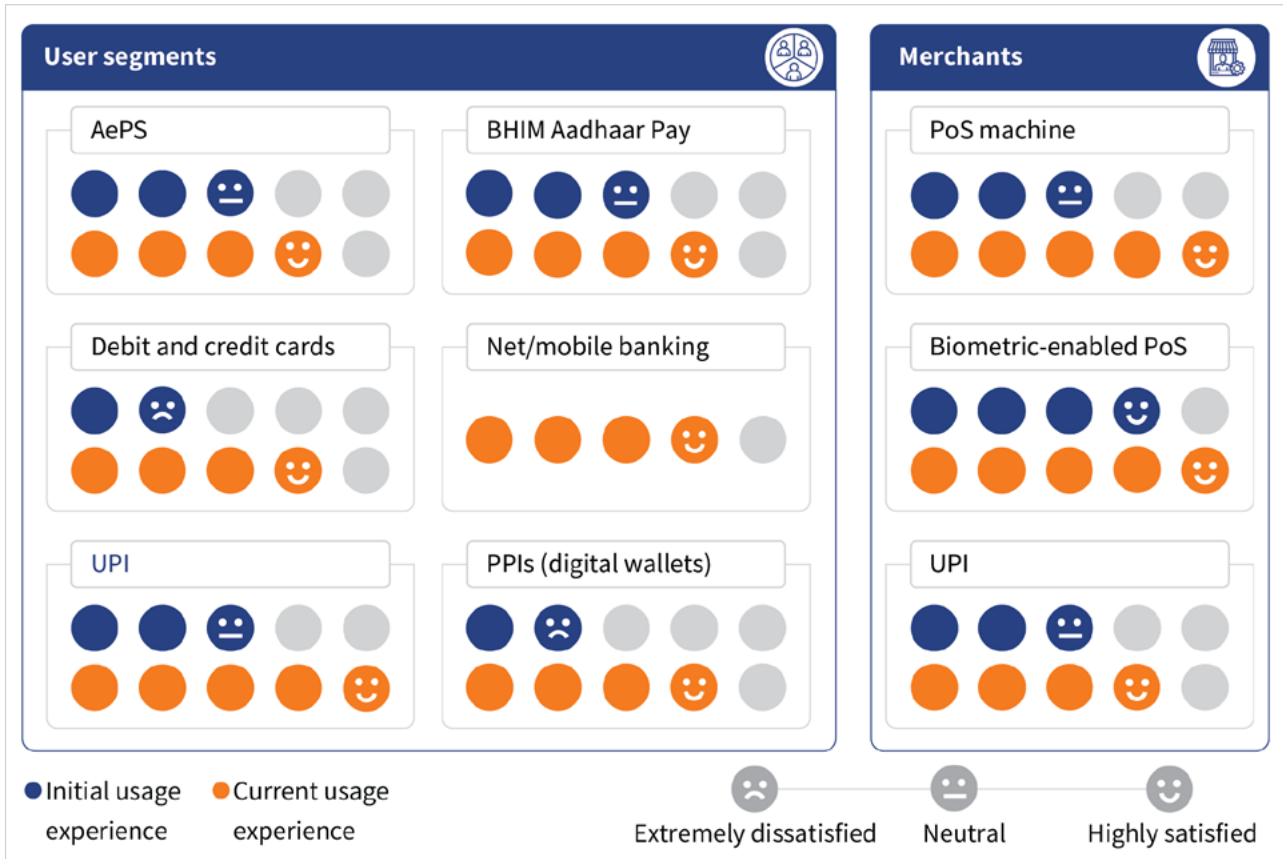
- **Performance expectancy** refers to the improvements in product performance that led to improved usage and adoption of digital payments by users. These improvements include enhanced product features and design, reduced transaction failures, and better grievance resolution, among others.
- **Effort expectancy** refers to the degree of ease associated with users who adopt digital payment solutions.
- **Social influence** reflects on the direct or indirect social and influential push to use digital payments, either initiated from the supply side, such as FinTechs or banks and from the demand side, such as merchants and billers, among others.
- **Facilitating conditions** refer to the presence of the digital payments’ acceptance and usage infrastructure mainly on the demand side, such as the availability of PoS machines or QR codes with merchants of their choice, or even factors, such as Internet availability, among others.
- **Price value** refers to the time and costs involved for users to conduct cash-based transactions compared to digital payment transactions.



6.1: Performance expectancy

Performance improvement 1: Reduced transaction failures

Figure 22: Usage experience levels of users and merchants

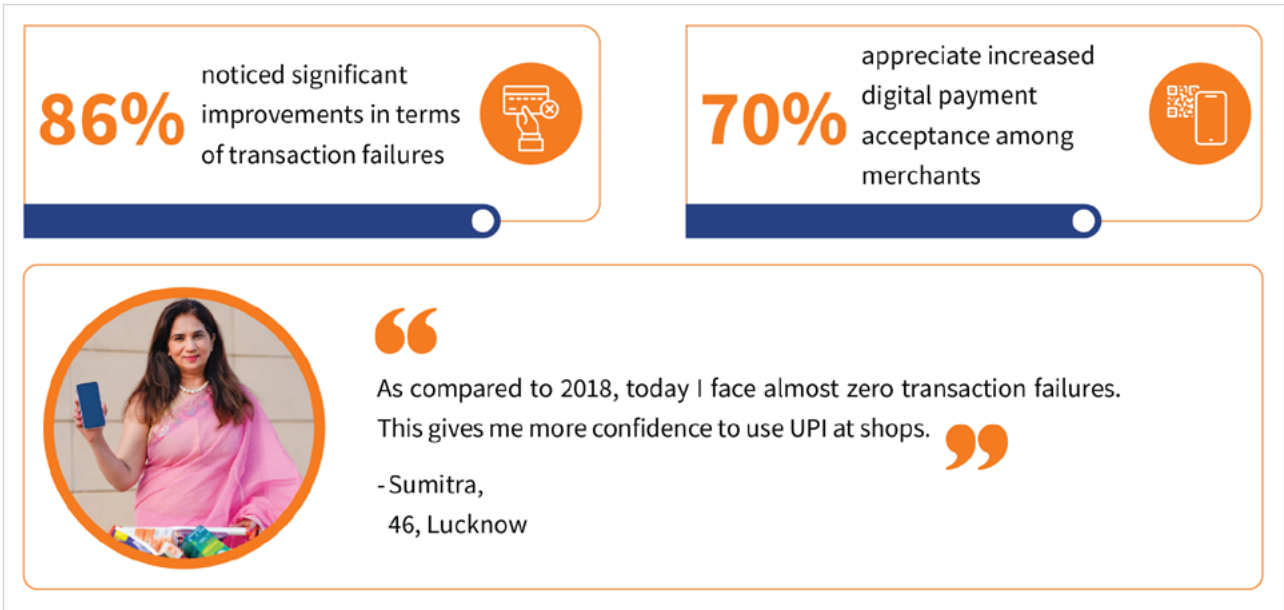


During this period, banks and PSPs witnessed an overwhelming rise in the uptake and usage of retail digital payment instruments, especially UPI. The high demand increased the load on their backend infrastructure and created issues¹²⁰ in achieving a 100% success rate for digital payments. Users reported several instances of transaction failures and even transaction declines. However, such issues have been mostly addressed today with an 80-90% improvement rate,¹²¹ based on NPCI's and PSPs' collaborative efforts.

90% of the respondents in our study also highlighted that over the years, their experience of digital payments has become seamless and led to better satisfaction overall. Similarly, 84% of merchants are more motivated to use and accept digital payments than before since transaction failures have significantly reduced.



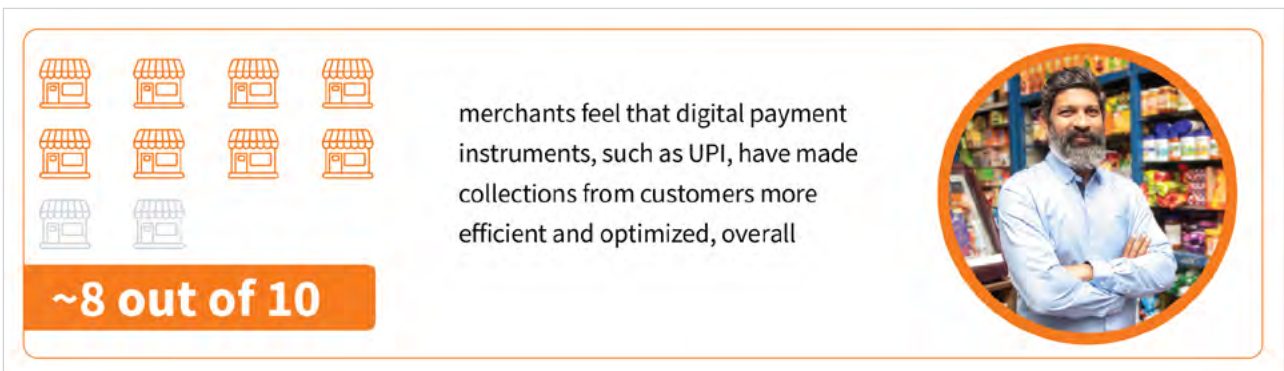
Figure 23: Improvement in digital payment experience compared to earlier



Performance improvement 2: Interoperability across PSPs that offer UPI and PPI (digital wallet) services to their users

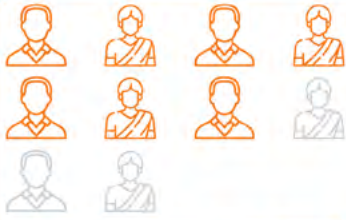
In early 2023, NPCI introduced interoperability guidelines¹²² for the UPI ecosystem that allowed user segments to pay or send money using any PSP (through a UPI app) regardless of the QR code or UPI service provider chosen by the merchant or recipient. Further, it allowed PPI wallets to be part of an interoperable UPI ecosystem, which, in layperson’s terms, bridged the technological gap between UPI and PPI wallets. The guidelines, therefore, eliminated the need for user segments to register for multiple PSPs to pay multiple merchants, and thus reduced the friction to get onboard to multiple platforms.

Both these performance improvements, coupled with the consistent efforts of the regulators, banks, and payment service providers, have helped catapult the transaction volumes for UPI significantly from ~429 million transactions in 2017 to ~118 billion¹²³ in 2023.



6.2: Effort expectancy

MSC’s field research shows that 65% of user segments started to use UPI and debit and credit cards, among other digital payment instruments, in early 2020, mostly during the COVID-19 pandemic. Most of these user segments started their digital payments journey with UPI and PPIs (digital wallets). Similarly, 60% and 66% of merchants started to accept card and UPI payments during the same period, respectively.



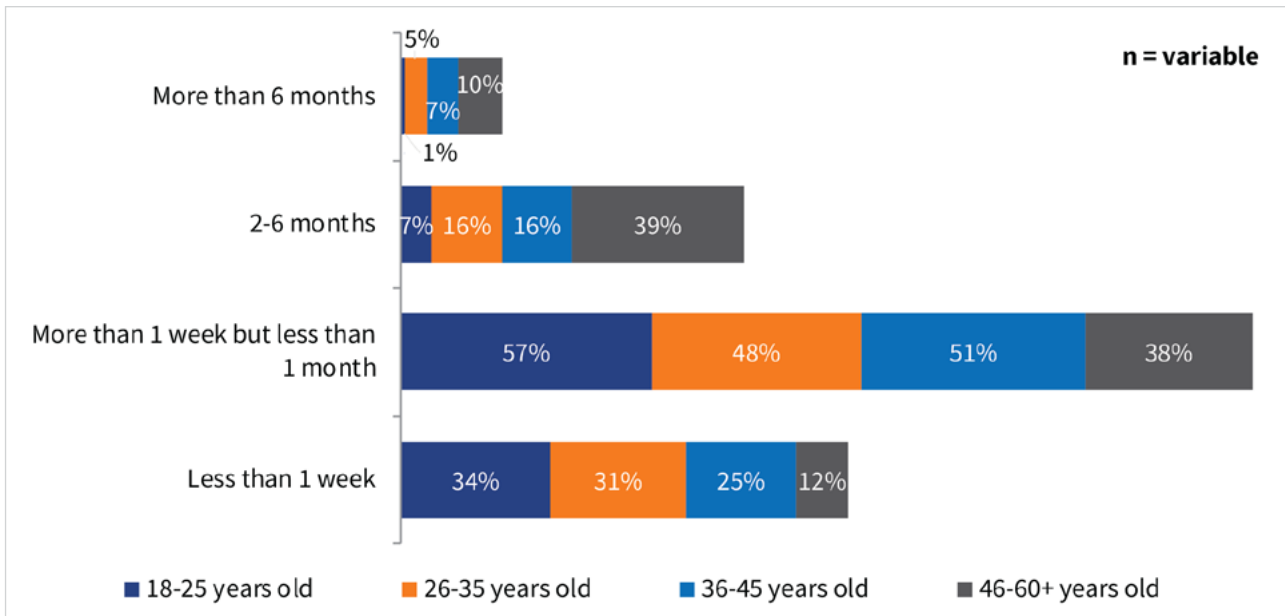
respondents adopted UPI during or after the COVID-19 pandemic as an alternative to cash



~7 out of 10

The learning curve for digital payment modes varied with age, literacy level, and social circle. The study revealed that approximately half of all user segments took a few weeks (less than a month) to understand and evaluate their preferred digital payment modes before they became comfortable with them. Conversely, 34% of young adults, given their familiarity with smartphones and digital technology, took less than a week to become familiar with their chosen digital payment modes. These payment modes included UPI, digital wallets (PPIs), debit cards, and credit cards.

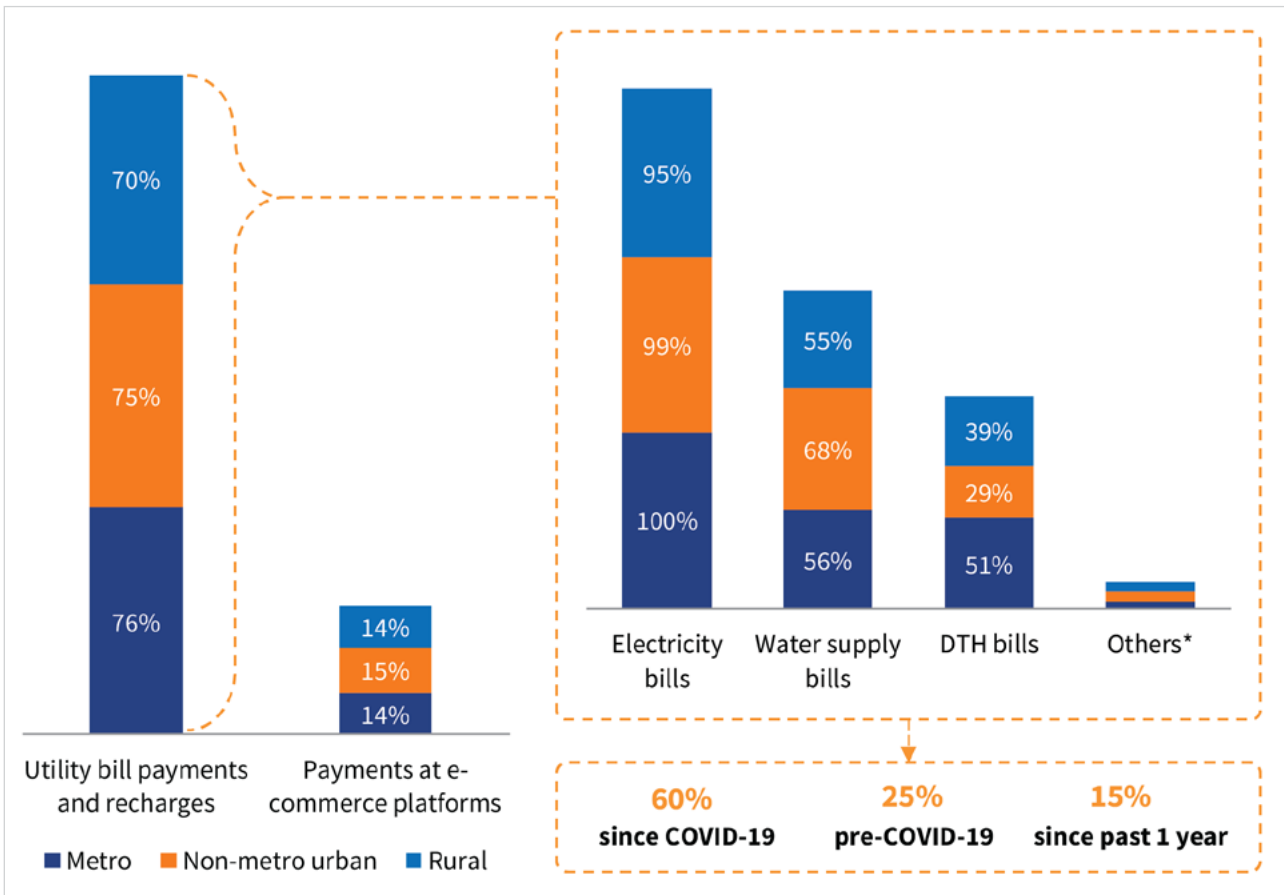
Figure 24: Time taken to get acquainted with digital payments across different user segments



92% of respondents in the study use UPI and PPIs to make P2P payments, followed by 88% who used digital payment instruments to purchase at retail stores and outlets. 72% of user segments who use UPI and PPIs used these models to make utility bill payments through the BBPS channel and appreciated the reduction in effort these payment modes offered. More than 21,600 billers¹²⁴ have implemented a digital collection model through BBPS, among other channels or portals, which has improved convenience¹²⁵ for multiple user segments. BBPS has also increased the frequency of bill payment collection from a supplier perspective—from quarterly billing to monthly billing for almost all bill categories. The adjoining chart shows bill payments as a key use case for user segments, which is further bifurcated into the type of bill payment they make.¹²⁶



Figure 25: Split of digital bill payments use case and its adoption



66% of rural digital payment users prefer to make bill payments through BBPS. This shift is mainly attributed to the earlier logistical challenges and inconvenience associated with the need to travel long distances to make in-person bill payments.



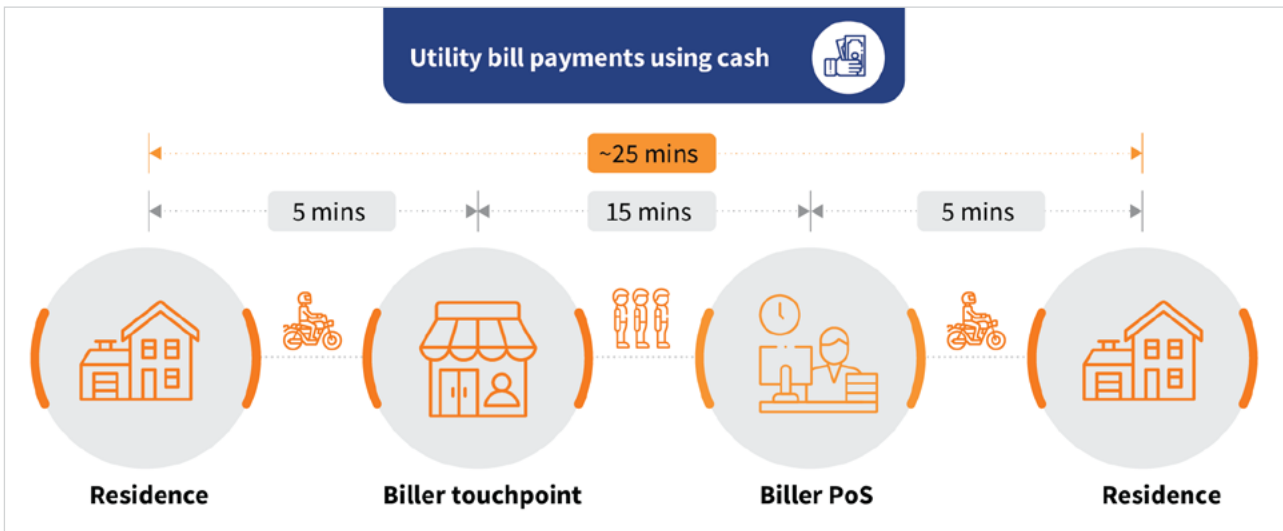
Around 60% of female users, primarily homemakers, prefer BBPS for bill payments. This preference stems from the convenience of being self-reliant in managing bill payments from the comfort of their homes, without the need to depend on others.



Furthermore, assuming an electricity provider's office or retail outlet is approximately 3 kilometers away from the user, the round trip to this location and the 15-minute queue time would consume at least 25 minutes for a single bill payment. In contrast, a platform, such as BBPS, enables them to achieve the same outcome remotely and conveniently within approximately three minutes, which saves a significant amount of time compared to the previous scenario.



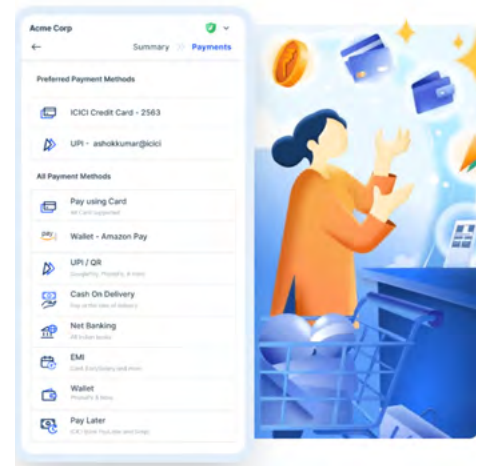
Figure 26: Convenience brought by digital bill payments to users



Reduced efforts for online retail users

Razorpay introduced the “Magic Checkout” feature to address affordability issues for small and micro online retailers who seek to integrate and deploy an array of digital payment modes and reduce their overall effort.

“Magic Checkout” is an end-to-end payment gateway that can load natively on the retailers’ website or app, from where a user can seamlessly select their choice of UPI or wallet PSP app, card network, or even cash, to conduct a payment. On the back end, this product takes care of the entire payment collection process and makes it easier for retailers to reconcile their sales volumes and values. This added layer of convenience between customers and retailers eliminates the effort to identify and deploy multiple payment acceptance modes for customers, a payment tracker for easy reconciliation by merchants, among others.

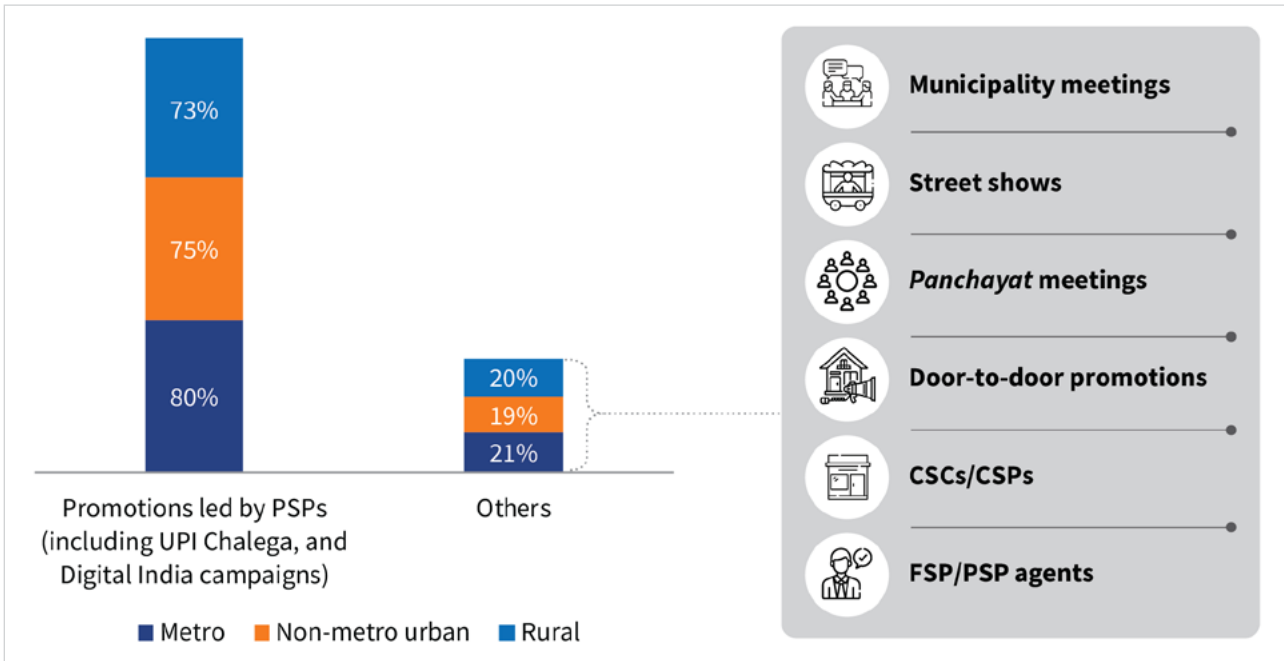


6.3: Social influence

Social influence plays a critical role to drive digital payment usage and adoption. About 57% of the study’s respondents were influenced by marketing and promotional activities carried out by various institutions, followed by social circles’ referrals (49%) and social media influencers (36%).



Figure 27: Promotional efforts that motivated users to adopt digital payments



The majority of the respondents (79%) recalled promotional activities carried out by NPCI and PSPs, such as Paytm, PhonePe, and Google Pay, over digital media, such as social media channels and television ads. This was followed by offline promotions, such as banners and co-branded QR codes at merchants' points of sale, among others. This also includes promotional efforts made under the "UPI Chalega" and "Digital India" campaigns. Hence, promotional activities conducted by PSPs, especially for UPI and digital wallets, contributed the most to creating awareness of digital payments.

	Around 70% of rural digital payment users were notably influenced by both above-the-line and below-the-line promotions alongside various targeted marketing activities. These initiatives played a vital role to encourage them to adopt the digital payments ecosystem beyond their initial curiosity.
	Only 20% of respondents expressed trust in both themselves and digital payment applications overall. This lack of trust largely stems from frequent reports of digital financial fraud and discussions within their social circles. The majority of users still harbor concerns about potential financial losses due to carelessness or security breaches.

<p>~6 out of 10</p>	<p>users were influenced by PSP-led promotions to adopt digital payments. They mostly recall offline promotional collaterals, such as banners and posters rather than digital videos and advertisements.</p>	
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Credits: Behance



6.4: Facilitating conditions

Improved acceptability and availability of digital payments are key factors for enhanced usage. The widespread availability of PoS machines and QR codes at merchant outlets continues to drive payments. In December 2016, ~1.7 million PoS machines were available to more than a billion customers. Whereas in 2023, the number of PoS machines in the offline retail market has grown by a CAGR of ~25% to 8.3 million¹²⁷.

To onboard small merchants on the digital payments journey, in 2019, NPCI launched the P2PM category of payments¹²⁸. This initiative, backed by MeitY, allowed small merchants, such as street vendors, to accept up to INR 50,000 in UPI payments each month in their savings bank accounts with zero MDR charges.

Another important driver of digital payment adoption is the cashback and rewards offered by payment service providers. About 71% of the study's respondents stated that rewards were one of the reasons why they started to use digital payments, namely PPIs and UPI, followed by credit cards. Back in 2017, some digital wallet and payments apps offered up to INR 100,000¹²⁹ as cashback or rewards to onboard customers and drive transaction volumes on their platforms. To date, PSPs, such as Paytm and Mobikwik provide rewards and incentives to new and seasoned users against particular transactions or use cases.¹³⁰



“

Back in 2017, when I started using CRED UPI, I usually received a cashback of INR 9 for every INR 10 that I used to spend to purchase a samosa. That drove down my applicable cost to INR 1. That means, for every 10 samosas I paid for using CRED UPI, I got nine samosas for free!

”

-Amrit Singh, 29
New Delhi

From the merchants' perspective, access to credit is another key factor in the adoption of digital payments. Merchants have adopted digital platforms, such as Paytm and BharatPe, which offer tailored flow-based microcredit to merchants based on the transaction data from QR code payments. This shift has made UPI QR payments ubiquitous, even in remote regions. The data gleaned from QR transactions is valuable for tech companies that enter the financial sector and offers insights for credit services to previously unbanked merchants. This can reduce lending costs and introduce new credit models to contribute to financial inclusion and the growth of the digital economy.

6.5: Price value

Before 2016, user segments largely depended on card payments on PoS machines to make non-cash payments at offline stores. However, the availability of PoS machines was limited due to their high cost (INR 5,000-12,000¹³¹) and connectivity issues. Hence, these devices were largely installed at big retail chains or stores that sell high-value products. As of December 2016, only ~1.7 million PoS machines were available to more than a billion customers. This significantly increased at a CAGR of ~25% to 8.3 million¹³² by 2023.

Over the years, the digital payments acceptance ecosystem has transformed and moved beyond PoS machines. UPI QR codes have disrupted the acceptance ecosystem as they offer a cost-effective alternative for PoS machines. It allowed smaller merchants, who found it difficult to obtain bank PoS machines, to accept digital payments. QR code payments and RuPay cards also removed another key barrier of the merchant discount rate (MDR), which amounted to as much as ~0.25%¹³³ of the transaction value. Sometimes, merchants pass¹³⁴ the MDR cost to customers when



they use credit or debit card payments, as they are reluctant to absorb the fee. Consequently, customers may opt for cheques or cash for P2M transactions to evade additional charges, unaware that merchants are prohibited¹³⁵ from imposing MDR costs on them.

As of October 2023, merchants have deployed more than ~306 million QR codes¹³⁶ at their retail outlets to accept digital payments. This number could be achieved rapidly owing to zero static QR deployment costs,¹³⁷ zero MDR, and a growing customer base of 300 million¹³⁸ and beyond, among other factors. Further, the peripheral sound box device enhanced the merchant user experience and came at a low cost—a monthly rental of INR 125.¹³⁹

In conclusion, given the value proposition of primarily using digital payment modes, user segments have experienced a notable decrease in the effort and costs to handle, store, and transport cash. Several PSP apps offer cashback and rewards for digital payments, which further incentivizes customers to adopt digital payment modes. Even offers from card networks, such as MasterCard and VISA, make digital payments alluring for customers. We can illustrate this further through the bill payment scenario for a customer, where the customer has to visit a biller touchpoint to make a payment, compared to the convenience of making the same payment remotely from home.



Users who visit a biller touchpoint typically incur at least INR 12 in fuel costs for the round trip, assuming they travel using their two-wheeler vehicle.¹⁴⁰ The expenses can be even higher if they travel in their car or public transportation, such as an autorickshaw or taxi. In contrast, if the same user uses a platform, such as BBPS, to pay using their phone, assuming an extraordinary data usage of 10 megabytes, the cost would still be as low as INR 0.1, considering current data tariffs.¹⁴¹ This represents a cost difference of 197%. Such a cost-effective approach can also be applied to other P2P and P2M transactions.





Figure 28: Price savings when paying bills digitally







Section

07

Way forward: Challenges and opportunities for growth in India's digital payments ecosystem



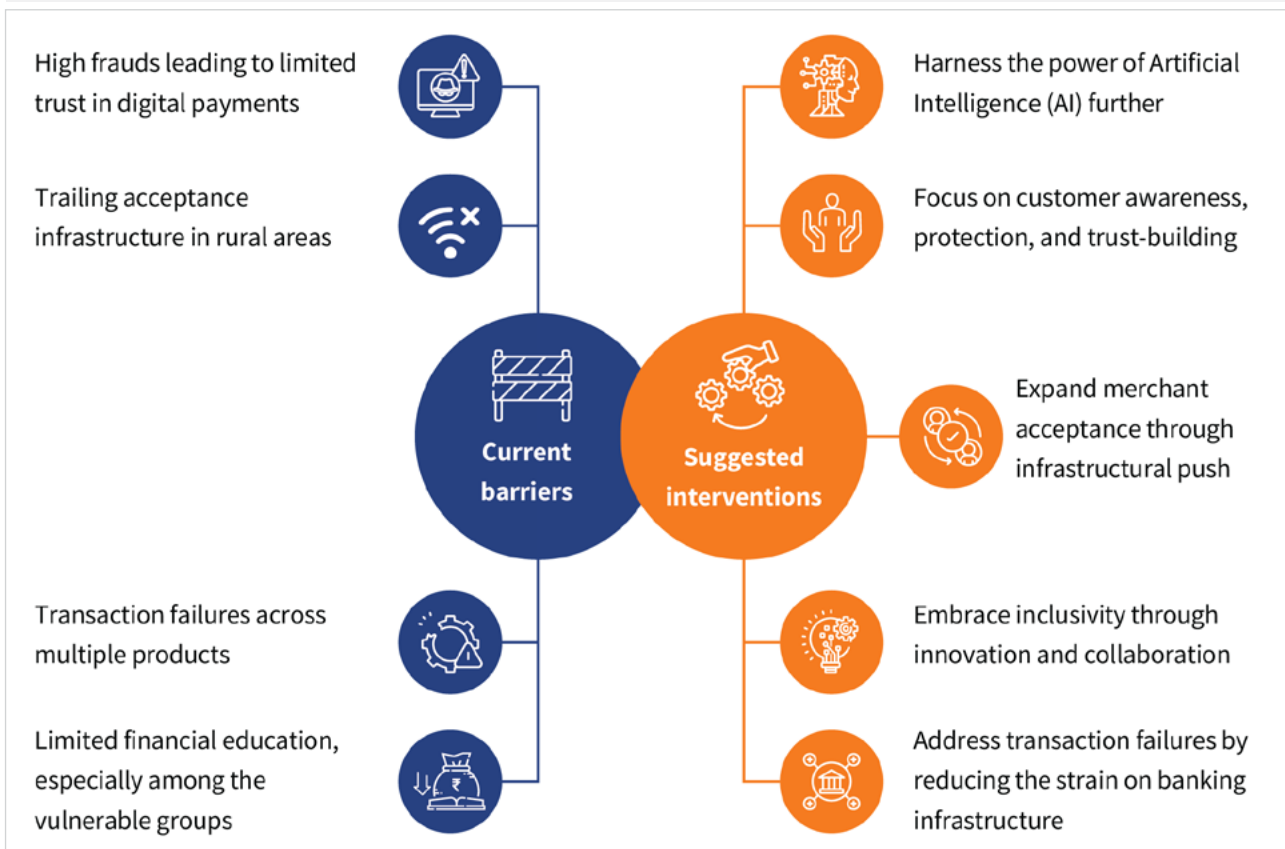


Despite the black swan events, such as demonetization and the COVID-19 pandemic, a large proportion of the population continues to use cash for their daily needs and expenses. This is evident as currency in circulation as a share of the GDP peaked at more than 14% in 2020-21 and moderated to 13% and 12%, respectively, in 2021-22 and 2022-23. However, while the prevalence of cash to GDP remains high, the cash growth rate has been declining since FY '18 (~37% YoY growth in FY '18 to 7% YoY growth in FY '23).¹⁴² This decline indicates a heightened usage of digital payments.

The rising number of FinTechs and their collaboration with banks, initiatives by the government, and changing consumer demand will continue to boost digital transactions in the country. Digital payments in India are about to reach an inflection point with an expected 3X growth in value to INR 830 trillion by 2026¹⁴³, with every two out of three payments being non-cash.

Moreover, digital payments in India are no longer an urban phenomenon. We see a rising usage of digital payments from the country's rural segments. This, coupled with the government's investment in excess of INR 650 million to promote digital financial services, such as UPI, IMPS, and bank PoS machines, in the rural areas,¹⁴⁴ has helped push digital payments to the country's hinterlands. Industry stakeholders increasingly agree that the next set of low-income users from these regions will drive the country's future growth of digital payments. These users vary drastically regarding their financial needs, preferences, and usage. They even face different challenges regarding access to financial services, which drive account inactivity in several cases. While 78% of India's population owns a bank account, as per the Global Findex Data 2021, the share of account owners with inactive accounts remains high at 35%. This is much higher than the 5% average for similar developing countries. High account inactivity can threaten the expansion of digital payments. Key barriers to the adoption of digital payments are:

Figure 29: Key barriers and suggested interventions for the growth of digital payments





1. Trailing acceptance infrastructure in rural areas:

Despite consistent efforts by ecosystem players, India's digital payments infrastructure continues to be sparse across different rural geographies. Existing financial touch points in India are considerably skewed toward urban regions. India has more than 63 million micro-merchants, of whom banks and traditional finance companies still underserve 96%. The country has deployed 8.3 million PoS machines, 1.4 million¹⁴⁵ BAP PoS machines, and more than 5 million¹⁴⁶ Bharat QR codes. Yet, this excludes around 77% of merchants in India from digital payments.¹⁴⁷

- 65%¹⁴⁸ of respondents from our study still face issues regarding accepting payment modes, such as UPI and cards (mostly in rural regions). Despite their preference to pay digitally, they use cash due to the non-availability of QR codes or PoS machines. These issues also apply to BAP, as many merchants in rural regions do not accept payments via BAP.

2. Limited financial education, especially among the vulnerable groups:

Financial literacy is critical as it empowers individuals to make informed financial decisions and achieve long-term financial security. Financially illiterate individuals are more vulnerable to debt traps. They can make poor investment choices and become victims of scams and predatory financial practices. This is particularly true for vulnerable groups, such as women, oral and non-numerate segments, who fail to achieve financial independence due to poor financial literacy. In India, only 27% of the population is financially literate, which highlights the need to improve awareness among the country's population¹⁴⁹.

3. Transaction failures across multiple products:

Transaction failures can occur either due to business or technical declines. While business declines can generally be prevented by maintaining sufficient balance in the payer's account or entering the correct authorization PIN, a failure leads to a fear of losing money in the customers' minds. This results in a lack of trust in digital payments, which impedes adoption. On average, banks and the NPCI face about 1.4%¹⁵⁰ of technical declines in UPI transaction volumes due to the unavailability of systems and network issues given UPI's unprecedented growth.

- Transaction failures due to network or technical issues remain a key challenge for ~70% of the respondents who use retail digital payment modes in the MSC study. This is exacerbated for assisted payment modes, such as AePS and BAP, followed by card payments through PoS machines, and is more prominent in rural and semi-urban areas
- ~10% of respondents in the MSC study (especially seniors) also face issues with grievance resolution due to a lack of awareness of proper channels to register and resolve their grievances

4. High instances of fraud, which lead to limited trust in digital payments:

As digital payments grow, instances of fraud in digital payments also grow. India saw a rise in fraud amid the increased use of formal financial services and the reliance on digital rails. These instances affect the newer DFS users, especially those without digital awareness.

- A 2021 Microsoft report suggests that consumers in India experienced a high rate (69%) of online fraud in 2021. Bank accounts reportedly had the highest incidence of fraud, followed by fraud on e-commerce sites.
- RBI data shows that fraud worth INR 604 billion was witnessed in 2021-22.¹⁵¹ Collectively, instances of bank fraud have resulted in India losing at least INR 10 billion every day over the past seven years.¹⁵²

These challenges need careful consideration and strategic thinking to build a more robust ecosystem that can handle the demands posed by the growing digital payments ecosystem. The time is ripe for players in the ecosystem to



undertake concerted efforts and build secure, safe, and interoperable digital platforms. Based on the prevailing trends, we envision the future of digital payments in India to be driven through the following interventions:

1. Harness the power of Artificial Intelligence (AI) further

Globally, AI has started to play an increasingly important role in digital payments. The adoption of AI has also been at the forefront for providers in India. More than 83%¹⁵³ of financial service providers in India use it to enhance their product and service offerings. They have also invested more than USD 3.2 billion¹⁵⁴ to develop AI-driven solutions. One such solution is Hello!UPI. In September 2023, NPCI launched Hello!UPI, an AI-powered conversational payments solution. It allows users to conduct digital payments across multiple use cases, such as mobile recharge, P2P transfers, and gas payments, among others, using their voice. While AI capabilities for digital payments in India are still nascent and evolving, stakeholders have been working to create an environment enabling AI use in the payments industry. We envision the role of AI to grow further toward:

- **Hyper-personalization:** AI-driven models can analyze user behavior and preferences to offer personalized recommendations and incentives tailored to individual needs. Hyper-personalization of user journeys and experiences is a vital driver of retention and engagement, wherein rich payment data is analyzed to provide hyper-personalized services that encourage users to rely on the payments app and access other financial products and services.
- **Improved fraud prevention and security:** AI models can help build trust among users through real-time analysis of transactions, anomaly detection, and biometric authentication. It can mitigate fraud-related concerns and ensure the safety of digital transactions.
- **Targeted outreach to the vulnerable, underserved segments:** Financial service providers can use AI to provide multilingual and region-specific support. This ensures that digital payment interfaces are accessible and user-friendly for individuals across different linguistic backgrounds, especially vulnerable segments, such as oral and non-numerate people. Moreover, providers can design targeted outreach campaigns to address specific concerns of different segments. The *Bhashini* app developed by MeitY¹⁵⁵ can be embedded in digital payment interfaces for multi-language support and enhanced user experience.

2. Focus on customer awareness, protection, and trust-building

Rising instances of fraud through digital payments have led to a loss of trust and reduced customer confidence in digital payments. Customer protection is thus of paramount importance. If customer protection guidelines are followed, it can offer benefits, such as improved risk mitigation, regulatory compliance, better customer experience, and a secure and innovative digital payments ecosystem. Financial entities need to streamline their products and services to ensure customer protection. This will foster customer trust and safeguard their interests. MSC's work with FSPs across regions suggests that they can strengthen customer protection by following the TRUST¹⁵⁶ principle:

- **Transparency** in pricing, processes, communication, and resolution
- **Relevance** of products and marketing
- **User-friendliness** of products and channels
- **Security** of customers' personal information and concerns
- **Timely** service to respond to customers' needs and complaints

Stakeholders need a comprehensive approach to create a secure and trustworthy digital payment environment to address the impact of fraud and inculcate a regular habit of digital payments among customers. This approach would involve technological advancements, robust security measures, user education, and stakeholder collaboration.



Adopting a physical + digital or “phygital” model can help customers conduct digital transactions in an assisted manner until they are digitally savvy and can conduct transactions independently. Providers should use BC agents or appoint feet-on-street at the block or district level to create further awareness of digital payments, help them register and resolve their grievances, and build trust in digital payments.

3. Address transaction failures by reducing the strain on banking infrastructure

Banks and financial service providers use various technologies to design products, services, and fraud management practices. However, most players struggle to navigate their legacy systems. RBI has made moves to reinforce the existing payment infrastructure in recent years. As a result, financial institutions have also made substantial investments to transition to an asset-light infrastructure, using cloud-based storage and services that help process transactions efficiently while keeping customer experience at the core. Emergency payment systems, such as the Lightweight Payment and Settlement System (LPSS), are expected to improve transaction processing rapidly, especially during emergencies or unforeseen events, while maintaining operational resilience.

The introduction of offline payment solutions, such as UPI Lite, UPI 123Pay, and e-RUPI, is a step in the right direction. Still, efforts are required to streamline the current transaction flow and scale these solutions faster to include the underserved segments.

4. Expand merchant acceptance through infrastructural push

While most metros and Tier 1 and 2 cities have shown remarkable digital payments growth, Tier 3 cities and below remain underpenetrated with significant scope for growth. The expansion of merchant capabilities to accept digital payments in Tier-3 and below cities is critical to onboarding the next set of users into the digital payments ecosystem. The offline, unorganized segment can be the next significant driver of merchant payment digitization through QR codes. This offline segment can contribute to approximately 75%¹⁵⁷ of all digital merchant payments, primarily attributed to the rising adoption of QR-based payments at point-of-sale terminals.

Providers should deploy more PoS devices at subsidized rates, such as smart PoS devices, to improve the country’s acceptance infrastructure and build merchant capabilities. Smart PoS devices can facilitate card payments and provide UPI transactions, pull-based transactions, and QR codes, among others. These devices can also use data analytics to offer embedded solutions, such as supply chain accounts payable and receivable management, inventory management, and customer relationship management (CRM) tools, and ultimately provide payment-plus services, such as credit and insurance. Integrated PoS solutions could allow merchants to manage their activities and payments on a single platform and drive footfall with targeted loyalty services to customers.

Along with these, the ecosystem must ensure that basic requirements, such as a stable internet connection, are available nationwide. Further, awareness creation among customers and merchants about offline solutions and solutions in regional languages is also key to boosting adoption.

5. Embrace inclusivity through innovation and collaboration

Collaboration is crucial to ensure innovation flourishes. When both elements are combined, it leads to the development of inclusive products for customers. Regulators have a critical role to foster a conducive environment for these collaborations to thrive and ensure that innovation in digital payments benefits everyone, including consumers, businesses, and the economy at large.

For instance, recent updates to the UPI ecosystem, such as the linkage of credit cards to UPI, credit lines on UPI, and international transactions through UPI, have opened up a unique opportunity to bring millions into the formal financial services space. Such innovative approaches will significantly impact the Indian economy and international businesses. The historical data of UPI transactions has become a prevalent indicator to evaluate individuals’ loan



repayment capacity, closely aligned with their spending ability and reflected in their income levels. The widespread adoption of UPI has facilitated increased lending, potentially leading to elevated expenditures, particularly in consumer durables, such as appliances, and non-durables, such as clothing. This spending surge can potentially positively affect the country's GDP and promote economic growth.

As outlined above, the future of digital payments in India hinges on a strategic blend of inclusive access, technological innovation, a supportive regulatory framework, enhanced merchant adoption, and collaborative efforts. Embedded payments via 5G and the Internet of Things (IoT) will provide further impetus. It is imperative to improve economics for various payment players. However, the effect of these initiatives on digital divide and the low and middle-income segments, especially vulnerable communities, remains to be seen. Regulators and service providers can address some of these concerns by enabling customer-centric interfaces, agent-assisted support, last-mile distribution networks, and robust grievance resolution mechanisms. If India can address current challenges and proactively collaborate with the ecosystem, it can emerge as a global leader in digital payments and foster financial inclusion and economic growth.





Section

08

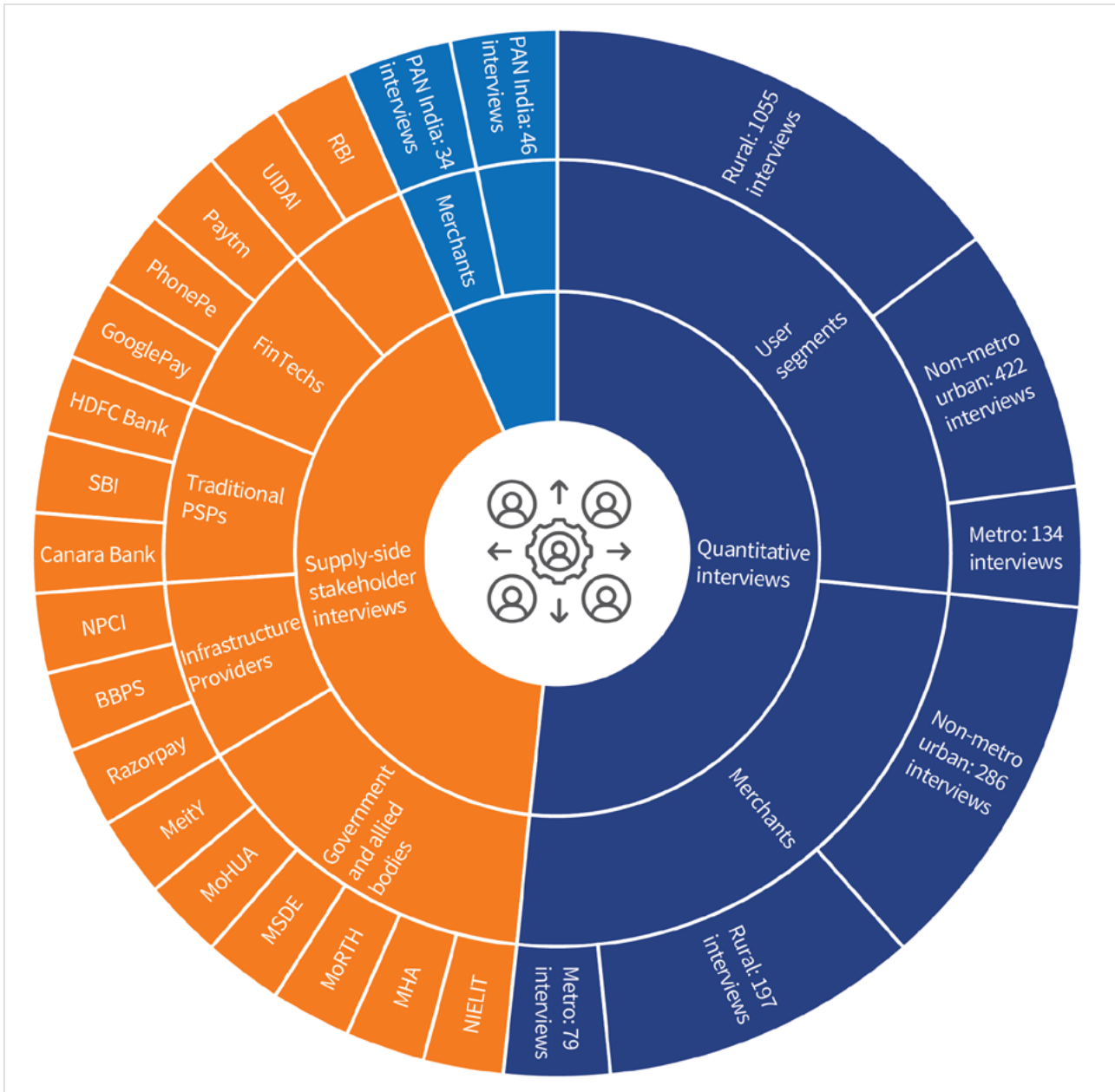
Annexes





8.1: Sampling plan and stakeholders interviewed

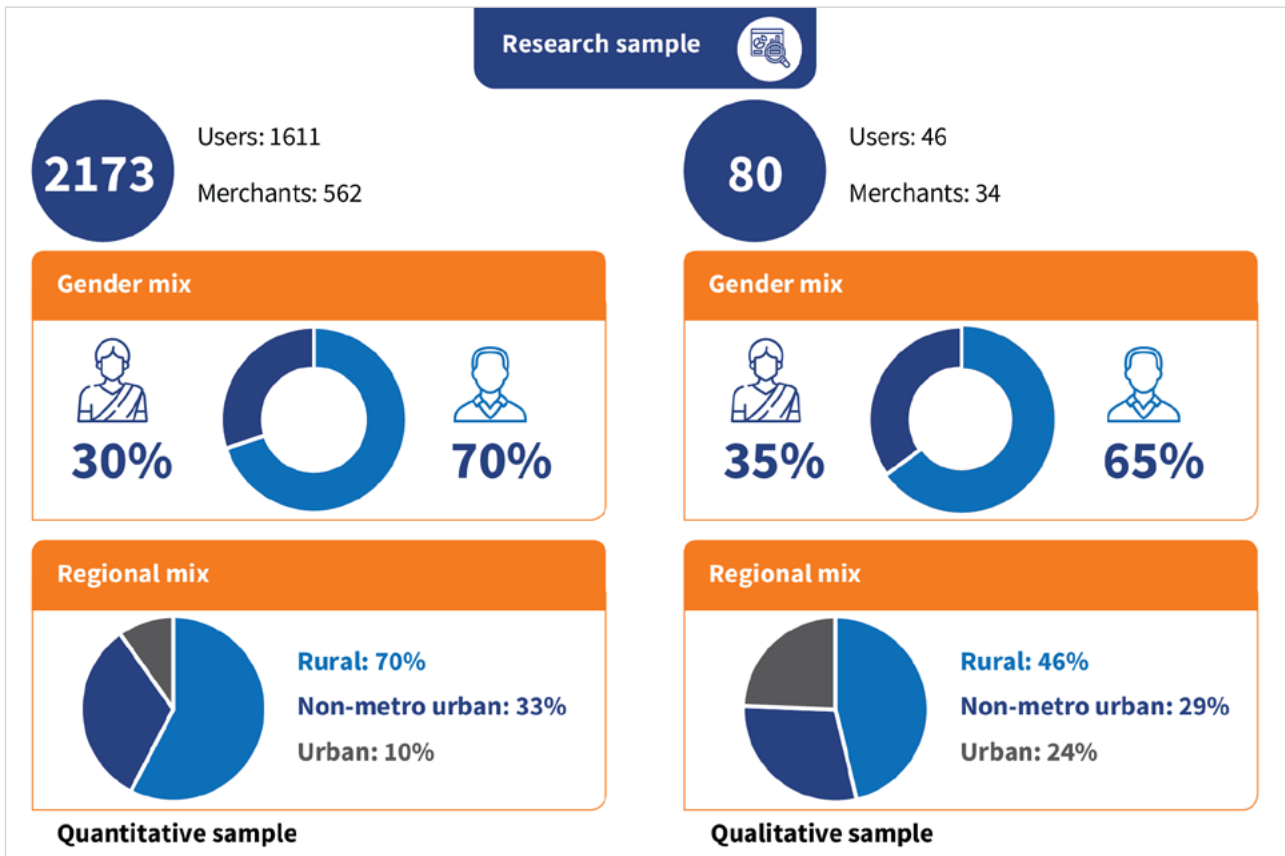
Figure 30: Stakeholders and user segments interviewed in this study



The following figure details the research sample alongside the demographic cuts taken into consideration to achieve a reasonably accurate pan-India picture.



Figure 31: Research sample split



Quantitative survey: The survey was done in nine states: Uttar Pradesh, Maharashtra, West Bengal, Telangana, Assam, Nagaland, Madhya Pradesh, Gujarat, and Himachal Pradesh.

Qualitative survey: The survey was done in four states: Uttar Pradesh, Maharashtra, Assam, and Gujarat, with a total sample of 80.

The table below highlights various digital infrastructure and payment usage parameters in multiple demographic cohorts as per the study.

8.2: Growth score methodology

We have developed three crucial components in the growth scorecard to gauge the progress on digital payments on account of works undertaken under the DIGIDHAN Mission.

These components are:

1. Growth in digital infrastructure;
2. Growth in digital payment instruments;
3. Digital payment uptake in socioeconomic factors.

These three components provide a comprehensive view of India’s digital payment landscape.

Although the growth scorecard has three main components, each carries a different weight (as discussed below). Multiple indicators and sub-indicators are under each of these components. These will include supply- and demand-side indicators to measure the various dimensions of financial inclusion. We have distributed the weights of various



indicators, sub-indicators, and components based on the impact that component had to drive the usage of digital payments.

The weights allocated to the three components are as follows:

1. Growth in digital infrastructure: 37%
2. Growth in digital payment instruments: 37%
3. Digital payments uptake in socioeconomic factors: 26%

We have assumed higher weights for the first two indicators as they are the enablers for digital payments and align with the focus areas of the DIGIDHAN Mission.

Key activities in preparation of the scorecard

	Indicator selection	Data collection methodology	Impact measurement methodology
Objective	Identify and select indicators for the growth scorecard	Finalize the secondary data sources and timeline of data	Developed a growth score to measure the change in the digital landscape over the years, from 2017 to 2023
Approach	<ul style="list-style-type: none"> • Assess initiatives undertaken • Identify and select relevant indicators 	<ul style="list-style-type: none"> • Define each indicator • Select data sources for each indicator • Find out the frequency of data publishing for each indicator • Analyze the coverage and optimize a methodology accordingly 	<ul style="list-style-type: none"> • Select measurement methods for selected indicators • Develop a growth scorecard

The scorecard design draws inspiration from the acclaimed Alkire-Foster (AF) method to measure multidimensional poverty. This method, adapted to evaluate growth, quantifies the various growth parameter under investigation cumulatively and incorporates diverse facets.

We have implemented 27 sub-indicators within our scorecard framework, each further delineated into 48 sub-components. The significance of these indicators is discerned through a meticulous weighting system, where each is assigned a weight corresponding to its relative importance. This strategic allocation of weights accounts for the nuanced contributions of each indicator and enriches the overall assessment through an emphasis on their varying degrees of influence. The process of calculating the scorecard can be divided into two broad categories:

1. **Identification:**
 - a. Determination of indicators and sub-indicators;
 - b. Normalize the different indicators to enable further computation;
 - c. Select weights to be applied to each sub-indicator;



- d. Calculate the weighted sum of growth for each component;
- e. Apply the second layer of weights by computing the weighted sum of each sub-indicator to get the total weighted sum of the indicators.

2. Aggregation:

- a. Based on the weights for each indicator, compute the overall growth score at the ecosystem level across the years.

Normalization of indicators

Scaling variables using min and max involves transforming the values of a variable to a specific range, typically between 0 and 1. This process is known as min-max or feature scaling. We have used the below formula to achieve min-max scaling for a variable x:

$$\text{Scaled value} = \frac{x - \text{Min}(x)}{\text{Max}(x) - \text{Min}(x)}$$

Here:

- x is the original value of the variable.
- $\text{Min}(x)$ is the minimum value of the variable.
- $\text{Max}(x)$ is the maximum value of the variable.

The scaled value will be between 0 and 1, with 0 representing the minimum value of the variable and 1 representing the maximum value. Since we had variables with different ranges, this methodology ensured that all the variables contributed equally to our analysis.

Discussion on weights:

The three categories (access, usage, and quality) have sub-categories, each with one or more than one indicator. Weights have thus been assigned at three levels, equaling 100% at every level.

The methodology that we followed is as follows:

1. The counting vector for different indicators (i up to j), also known as growth score (denoted by c_i), is their status (g_{ij}^0) in each indicator multiplied by the weight assigned to that indicator.
2. The growth score (or weighted growth) of indicator i can thus be denoted as:

$$c_i = w_1 g_{i1}^0 + w_2 g_{i2}^0 + \dots + w_j g_{ij}^0$$

$$\text{or, } c_i = \sum w_j g_{ij}^0$$

3. Since the weight structure follows the AF methodology, the sum of the relative weights of all the indicators equals 1. Therefore:

$$\sum w_j = 1$$



8.3: Abbreviations

AA	Account aggregator
AePS	<i>Aadhaar</i> -Enabled Payment System
APB	<i>Aadhaar</i> Payment Bridge
BAP	BHIM <i>Aadhaar</i> Pay
BBPS	Bharat Bill Payment System
BC	Business Correspondent
BCNM	Business Correspondent Network Managers
BHIM	Bharat Interface for Money
CDFI	Centre for Digital Financial Inclusion
CSP	Customer service point
DBT	Direct Benefit Transfer
DD	Doordarshan
DFS	Department of Financial Services
e NACH	Electronic National Automated Clearing House
e-KYC	Electronic Know Your Customer
e-RUPI	Electronic Rupee
FLC	Financial Literacy Centre
FSDC	Financial Stability and Development Council
FSP	Financial service provider
FY	Financial year
GoI	Government of India
GRM	Grievance Resolution Mechanism
HNI	High net income
HRD	Human Resource Development
I4C	Indian Cybercrime Coordination Centre
IBA	Indian Banks' Association
ICT	Information, Electronics, and Communications Technology
IMPS	Immediate Payment Service
INR	Indian Rupee
IPPB	India Post Payments Bank
iSPIRIT	Indian Software Product Industry RoundTable
IT	Information technology
IVR	Interactive voice response
JAM Trinity	<i>Jan Dhan</i> , <i>Aadhaar</i> , and Mobile
LMI	Low- and middle income
LPG	Liquefied petroleum gas
MDR	Merchant Discount Rate
MeitY	Ministry of Electronics and Information Technology
MFI	Microfinance institution



MFIN	Microfinance Institutions Network
MHA	Ministry of Home Affairs
MoHUA	Ministry of Housing and Urban Affairs
MoPNG	Ministry of Petroleum and Natural Gas
MoRTH	Ministry of Road Transport and Highways
MSC	MicroSave Consulting
MSDE	Ministry of Skill Development and Entrepreneurship
MSME	Micro, small, and medium enterprises
NBFC	Non-banking financial company
NCCRP	National Cyber Crime Reporting Portal
NCERT	National Council of Educational Research and Training
NCH	National Consumer Helpline
NCMC	National Common Mobility Card
NETC	National Electronic Toll Collection
NGO	Non-governmental organizations
NIELIT	National Institute of Electronics and Information Technology
NPCI	National Payments Corporation of India
OD	Overdraft
OMC	Oil marketing companies
ONDC	Open Network for Digital Commerce
PIN	Personal Identification Number
PM SVANidhi	<i>PM Street Vendor's AtmaNirbhar Nidhi</i>
PMGDisha	<i>Pradhan Mantri Gramin Digital Saksharta Abhiyan</i>
PMJDY	<i>Pradhan Mantri Jan-Dhan Yojana</i>
PMKVY	<i>Pradhan Mantri Kaushal Vikas Yojana</i>
PoS	Point of sale
PSO	Payment system operators
PSP	Payment service provider
QR Code	Quick Response Code
RBI	Reserve Bank of India
SBI	State Bank of India
SCM	Smart Cities Mission
SFB	Small finance bank
SMB	Small and medium business
SMS	Short Message Service
TRAI	Telecom Regulatory Authority of India
UIDAI	Unique Identification Authority of India
UPI	Unified Payments Interface
USSD	Unstructured Supplementary Service Data



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