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Pay Nearby

Step by step: Building the ladder from AePS to UPI for India's last-mile users

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Foreword

India's digital payments journey stands as a beacon of innovation and inclusion for the world. Over the past decade, robust government policies, a forward-thinking regulatory environment, and relentless efforts from industry stakeholders have transformed the way financial services reach every corner of the country. Today, more Indians than ever experience the convenience, safety, and reliability of real-time digital payments, bridging divides between urban and rural, banked and unbanked.

While platforms, such as UPI, have unlocked flexible, self-initiated payments for a vast segment of the population, a sizable proportion of India's citizens still depend on assisted financial services and last-mile cash-in-cash-out touchpoints. The *Aadhaar* Enabled Payment System (AePS) stands as a vital pillar in this landscape: enabling rural, remote, and underserved communities to access their funds, receive government benefits, and participate in the digital economy—all through simple, trusted biometric authentication.

At PayNearby, we remain committed to powering this transformation. We believe that a strong, scalable agent network underpinned by technology, training, and trust is essential to bring millions onto the digital financial ladder and guide them toward independent digital engagement.

This whitepaper draws upon rich data from our agent network and deep expertise from MSC (MicroSave Consulting), which offered insights into the progress, persistent challenges, and new opportunities facing AePS and assisted payments in India. We hope our findings contribute to a wider conversation around digital inclusion and inspire all ecosystem stakeholders to collaborate in building a more financially inclusive India.

Anand Kumar Bajaj

Founder, MD & CEO, PayNearby

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Our gratitude extends to every contributor who helped bring together research, analysis, and creative collaboration, ensuring the rigor and relevance of this whitepaper. Finally, we thank the readers whose engagement advances the dialogue on driving inclusive digital payments in India.

Opening

India has emerged as a global leader in digital public infrastructure (DPI) and has set global benchmarks in scale, innovation, and adoption. The DPI payments ecosystem, in particular, has demonstrated how technology can drive financial inclusion at scale. Against this backdrop, Unified Payments Interface (UPI) has transformed the way the country pays. It has made digital payments accessible to users through an easy mobile interface and widespread merchant acceptance enabled by QR codes, soundboxes, and POS machines. This transformation in payments has reshaped commerce, which has moved millions away from cash and into secure, real-time digital transactions through smartphones.

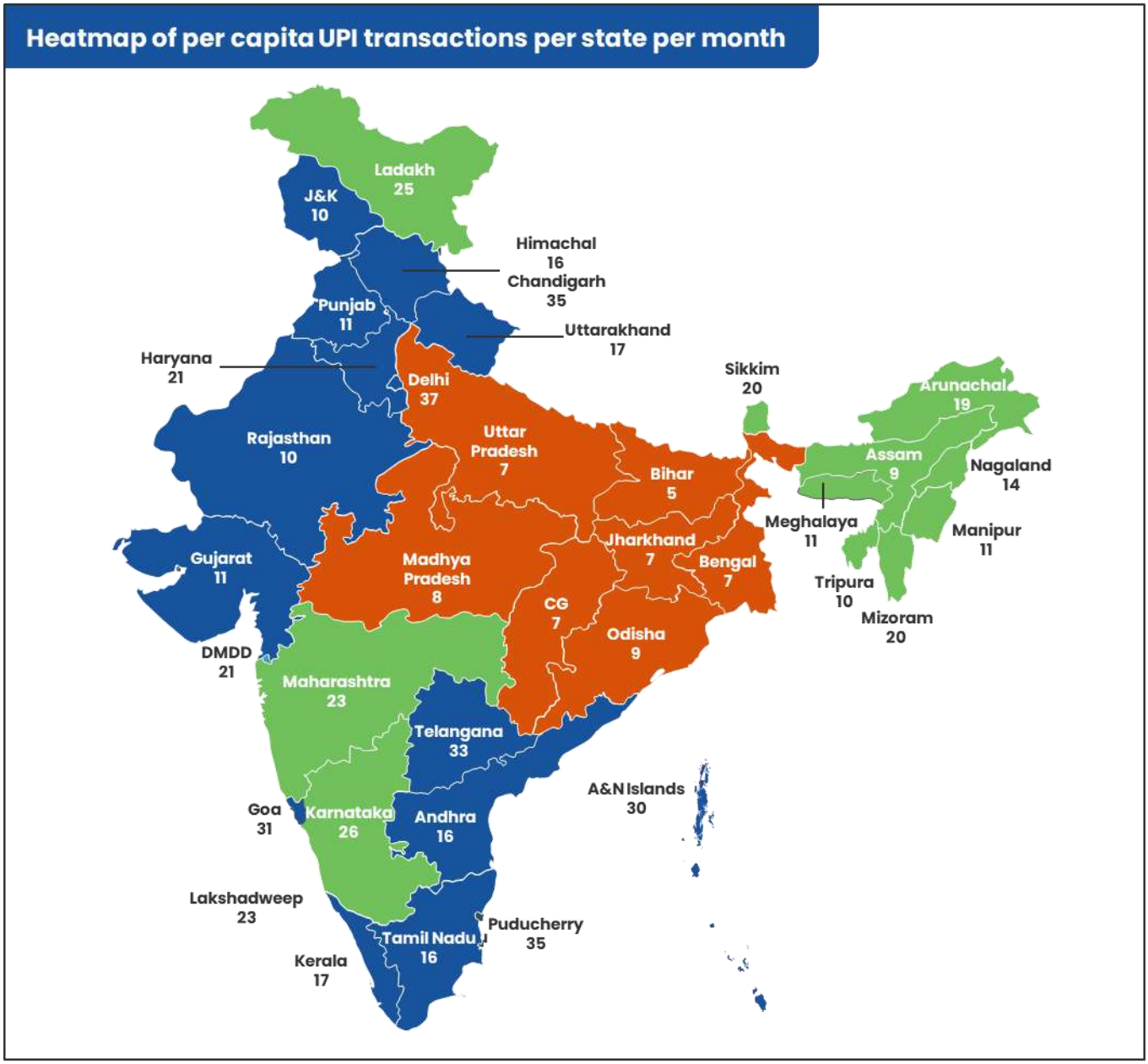


Figure 1: Heatmap of per-capita UPI transactions per state per month (source)

However, as revealed by the attached heatmap, disparities persist across the Indian states. While Maharashtra, Karnataka, Tamil Nadu, and Delhi lead in per capita monthly UPI transactions, populous states, such as Uttar Pradesh, West Bengal, Jharkhand, Chhattisgarh, and Bihar, are behind. Bihar records only five monthly transactions per capita, the lowest in the country. This low UPI usage corridor is driven by a complex interplay of factors, such as limited smartphone availability, low digital literacy, poor internet connectivity, and entrenched social norms that hinder adoption.

In this backdrop, the *Aadhaar* Enabled Payment System (AePS) offers a critical solution. AePS becomes an essential assisted channel for last-mile financial touchpoints, with its design focused on accessibility through biometric authentication and no smartphone requirement. It enables cash-out and peer-to-peer transactions where digital self-service is currently unfeasible. Yet, the AePS ecosystem faces major challenges that threaten scalability, which include low agent viability, interoperability restrictions, and security concerns.

These notable challenges demand urgent attention because AePS is the most practical payment option for many users and serves as a crucial digital on-ramp. Through AePS and the Business Correspondent (BC) agent network, millions can develop digital skills and build the confidence needed to shift to self-initiated payments on platforms, such as UPI.

This whitepaper explores these challenges and opportunities. It highlights the underserved segments that remain on the margins of digital payments. It delves into how AePS functions as an indispensable bridge for these populations. It outlines the obstacles limiting AePS growth. It presents practical solutions that financial ecosystem stakeholders can deploy to overcome these hurdles. Ultimately, it lays out a pathway to enable greater financial inclusion through the complementary strengths of AePS and UPI, which drives India’s digital payments revolution deeper into every corner of the nation. This whitepaper is grounded in rich transaction data and frontline perspectives gathered from PayNearby’s extensive agent network and enriched by MSC’s two decades of experience to analyze India’s payments landscape.

Section 1: Why has the last mile still lagged?

India's digital payment ecosystem has witnessed unprecedented growth in recent years, driven by innovations, such as UPI, *Aadhaar*-enabled systems, and *Jan Dhan* accounts. Today, nearly 89% of adults hold a financial account. Yet, inclusion on paper does not automatically translate into meaningful participation. Approximately 14% of adult bank accounts remain inactive, and less than half (48.5%) report the use of digital payments within the past year. The progress is real, but uneven.

This whitepaper identifies and analyzes the underserved segments in India's digital payment landscape, those groups that, despite access, face persistent structural, behavioral, and ecosystem barriers that limit active usage. These underserved groups, primarily rural households, women, informal workers, and the elderly, show consistently lower transaction volumes, high account dormancy, and encounter systemic challenges that undermine the promise of digital finance. To understand these dynamic barriers, it is essential to design customized interventions that foster truly inclusive growth.

To analyze these disparities, we categorize barriers to financial inclusion into three overarching dimensions:

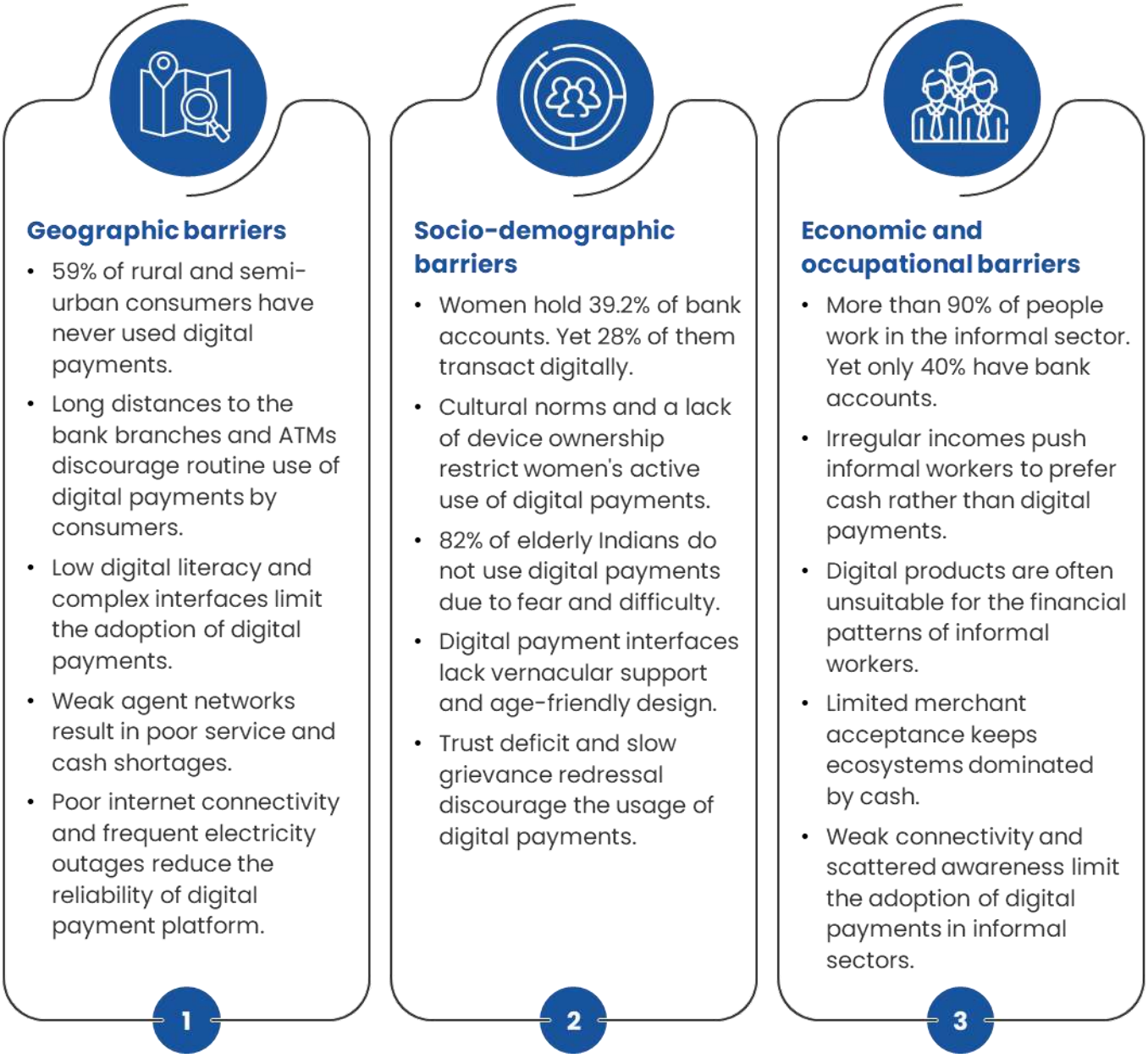


Figure 2: Key barriers to digital financial inclusion

- Geographic Barriers: Challenges rooted in remoteness and inadequate infrastructure, which affect rural and remote populations.
- Socio-Demographic Barriers: Constraints linked to cultural norms, device access, and usability, which affect women and the elderly.
- Economic and Occupational Barriers: Structural and behavioural obstacles tied to informal employment, irregular incomes, and cash dependence.

This framework helps to pinpoint where and why digital payment adoption fails and what targeted solutions may be required. However, the identified barriers are not exhaustive, and there can be anomalies that fall outside the scope.

Geographic barriers: infrastructure, accessibility, and connectivity challenges in rural and remote India

Rural households are the backbone of India's population, yet they remain an underserved segment in digital finance. Nearly 59% of consumers in rural and semi-urban areas have never used digital payments, and even among those with some exposure, only 41.9%% report to have transacted digitally at least once. Adoption falls much further in remote pockets due to infrastructural and systemic barriers.

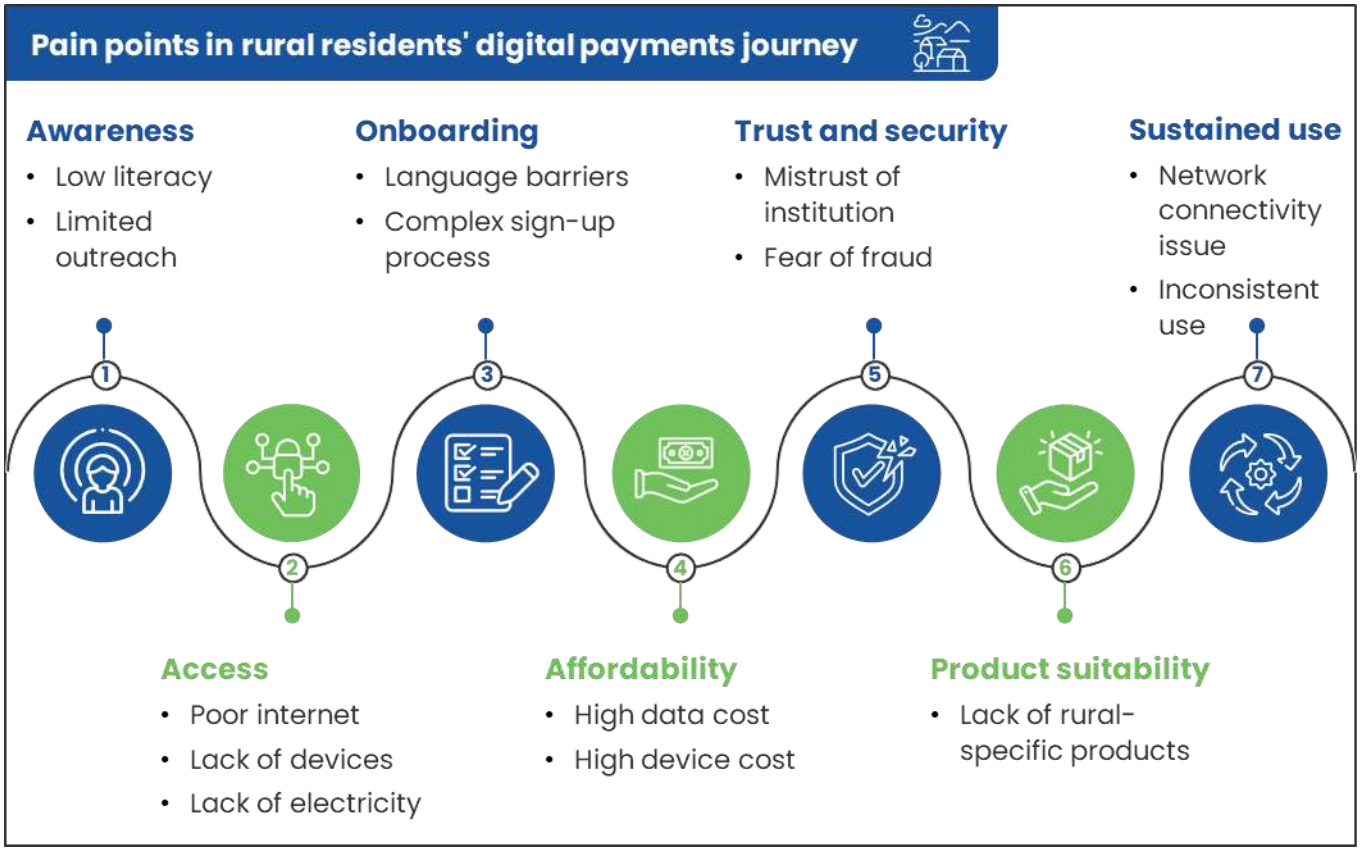


Figure 3: Pain points in the rural DFS inclusion journey

Rural financial transactions are often dominated by agricultural payments, government subsidies, and daily small-value purchases. This requires payment solutions that are both resilient to connectivity challenges and easy for users with limited digital literacy to adopt.

However, in practice, these needs are impeded by deep-rooted challenges that exist at the customer, provider, and ecosystem levels.

Key customer-level challenges:

- Physical distance from financial services: Many villages still lack nearby bank branches, ATMs, or business correspondent outlets, which forces households to travel long distances and incur costs simply to access cash or services. This discourages routine engagement with formal finance.
- Low digital literacy and interface complexity: Rural users often lack the skills and confidence to navigate payment apps, which are rarely personalized to local dialects. The absence of intuitive, voice, or vernacular-based tools results in dependence on intermediaries.
- Trust and reliability concerns: Failed transactions, anecdotal stories of fraud, and opaque fee structures amplify distrust about digital modes of payment, which leads many to choose cash even after initial trials.

Key provider-level challenges:

- Uneven spread of agent network: Agents are unevenly distributed, with many regions that face agent deserts. Even where agents exist, service is inconsistent due to cash shortages, poor infrastructure, or lack of training.
- Product design misalignment: Services that require smartphones or steady internet connections are not fully inclusive of many rural users. Many solutions are not operational for feature phone users and lack offline capability.
- Operational inefficiencies: High AePS transaction failure rates (especially OFFUS transactions) and frequent technical downtime erode trust in the formal system.

Key ecosystem-level challenges:

- Digital infrastructure gaps: In many rural areas, internet access can be inconsistent, with slow speeds and frequent disruptions. Mobile network coverage is often limited, and unreliable electricity supply causes service interruptions. These factors undermine reliance on digital platforms when users need them the most, especially for everyday financial transactions.
- Merchant acceptance barriers: Small shops and local merchants in villages often face challenges when they adopt digital payment methods. Point-of-sale machines and other such tools are costly to maintain, and many merchants question whether the number of digital transactions will justify the expense. For those who are comfortable with cash, the move to digital systems may feel unnecessary or even risky, which slows down the spread of digital payment habits.

- Fragmented awareness campaigns: Efforts to promote financial literacy in rural communities are usually carried out through short-term programs or campaigns. However, these do not always build long-lasting awareness or confidence. Messages are often not personalized to the local language, culture, or daily realities of the people. Without localization and regular follow-up, the lessons introduced during these programs tend to fade quickly, which leaves many still hesitant to engage with digital finance.

Socio-demographic barriers: Cultural, gender, and age-related constraints that affect financial inclusion

Financial participation is also heavily shaped by demographic and cultural factors. Women hold 39.2% of bank accounts nationally and an even higher, 42.2% in rural areas. Yet their engagement with the formal financial system remains limited as their accounts serve largely as channels for government benefits, not as active vehicles of savings, payments, or investment. Digital engagement among women is minimal, with only 28% transacting digitally, reflecting cultural norms, unequal device ownership, and lower financial literacy. Additionally, restricted mobility, concerns about digital security, lack of tailored digital products, and limited awareness of available digital services constrain the use of digital financial tools.

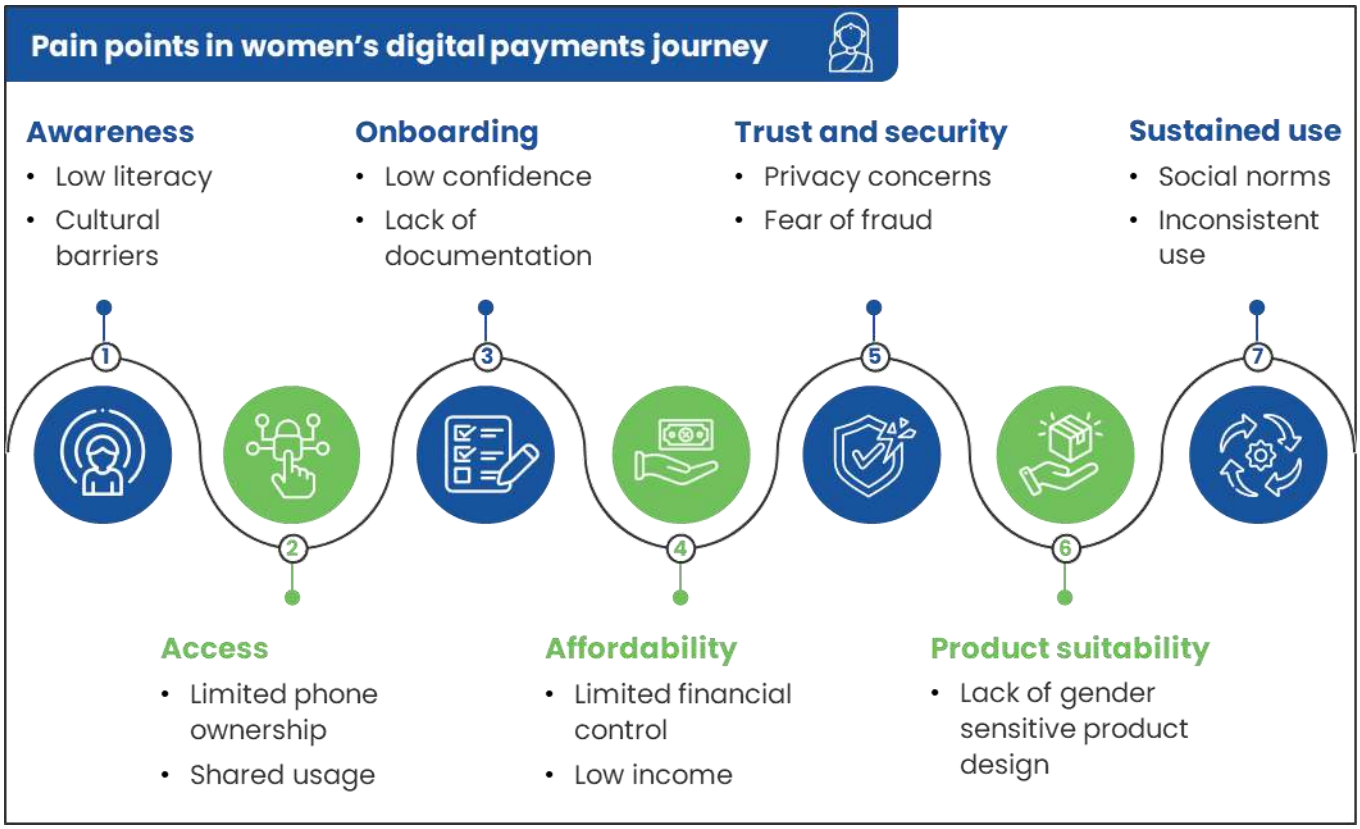


Figure 4: Pain points in the DFS inclusion journey for women

Similarly, India's elderly population of 149 million remains almost entirely excluded from the digital ecosystem. Nearly 82% of the elderly population does not use digital payments, as they cite discomfort with technology, fear of fraud, and difficulties related to age. Their core financial needs revolve around pensions, healthcare expenses, and household spending. Yet the current system offers them little reassurance through simplified processes, caregiver assistance, or age-sensitive security safeguards.

These groups require products designed with inclusivity in mind, simple, secure, and responsive to their realities. Yet their ability to engage meaningfully with digital finance is consistently undermined by a set of barriers that operate at multiple levels, which include:

Key customer-level challenges:

- Socio-cultural restrictions for women: Many women lack independent device ownership, face restrictions on mobility, or are socially discouraged to make autonomous financial decisions, which limits their ability to transact digitally.
- Technology discomfort for the elderly: Older adults often lack prior exposure to technology, to use smartphones, PIN entry, and navigate interfaces. Age-related physical constraints, such as poor eyesight or motor skills, further compound challenges.
- Trust deficit: Women and elderly users often fear irreversible errors or being victims of fraud. In patriarchal households, women have less exposure to grievance redressal mechanisms, which weakens their financial security.

Key provider-level challenges:

- Product unsuitability: Few payment products are designed with gender or age sensitivity in mind. Interfaces are text-heavy, lack vernacular voice guidance, and ignore the cognitive and physical challenges the elderly face.
- Gaps in customer support: Limited assistance at the point of use means women and the elderly who face difficulties often abandon digital channels altogether. Grievance redress remains slow and unresponsive for these groups.
- Lack of targeted training or outreach: Providers' awareness drives rarely speak directly to women's entrepreneurial needs or the elderly comfort concerns, which leaves them dependent on intermediaries for their digital transactions.

Key ecosystem-level challenges:

- Rigid regulatory framework: Strict e-KYC norms that require individual smartphone ownership or specific documents inadvertently penalize women with shared devices or the elderly without valid ID access.
- One-size-fits-all awareness efforts: National literacy programs are often generic, without customized content to the socio-cultural needs of women or the accessibility challenges of the elderly, which limits their effectiveness.

In our village, women are often afraid to share their Aadhaar details, fingerprints, or money because they do not fully trust the system yet. In the past, there were very few phones, and usually just one in the whole family, so it was hard for women to get OTPs to complete transactions. Even now, most women do not have smartphones; instead, the younger men and boys have access to phones. Even the women who do have smartphones do not really know how to use digital banking apps. As a result, they use cash for everything and do not feel confident about digital payments.

- Kaveri (BC agent from Nanjanugda, Karnataka)

Economic and occupational barriers: Irregular incomes, informality, and cash dependency limit adoption

The most prevalent exclusion is visible in India's vast informal economy, which accounts for more than 90% of the workforce. Workers face irregular income flows, unstable job arrangements, and limited integration into formal financial systems. Hence, cash remains the dominant medium for transactions and money management as it offers immediate accessibility, convenience, and universal acceptance.

For workers in the informal segment, the barriers are particularly structural as they live in cash-heavy ecosystems with little merchant acceptance and no customized products for their irregular incomes. Savings tools and credit services are often designed for fixed cash flows, which makes them irrelevant to the unpredictable financial system of daily wagers, street vendors, and small-scale traders. Hence, they need accessible, flexible financial tools that recognize the volatility of their income patterns.

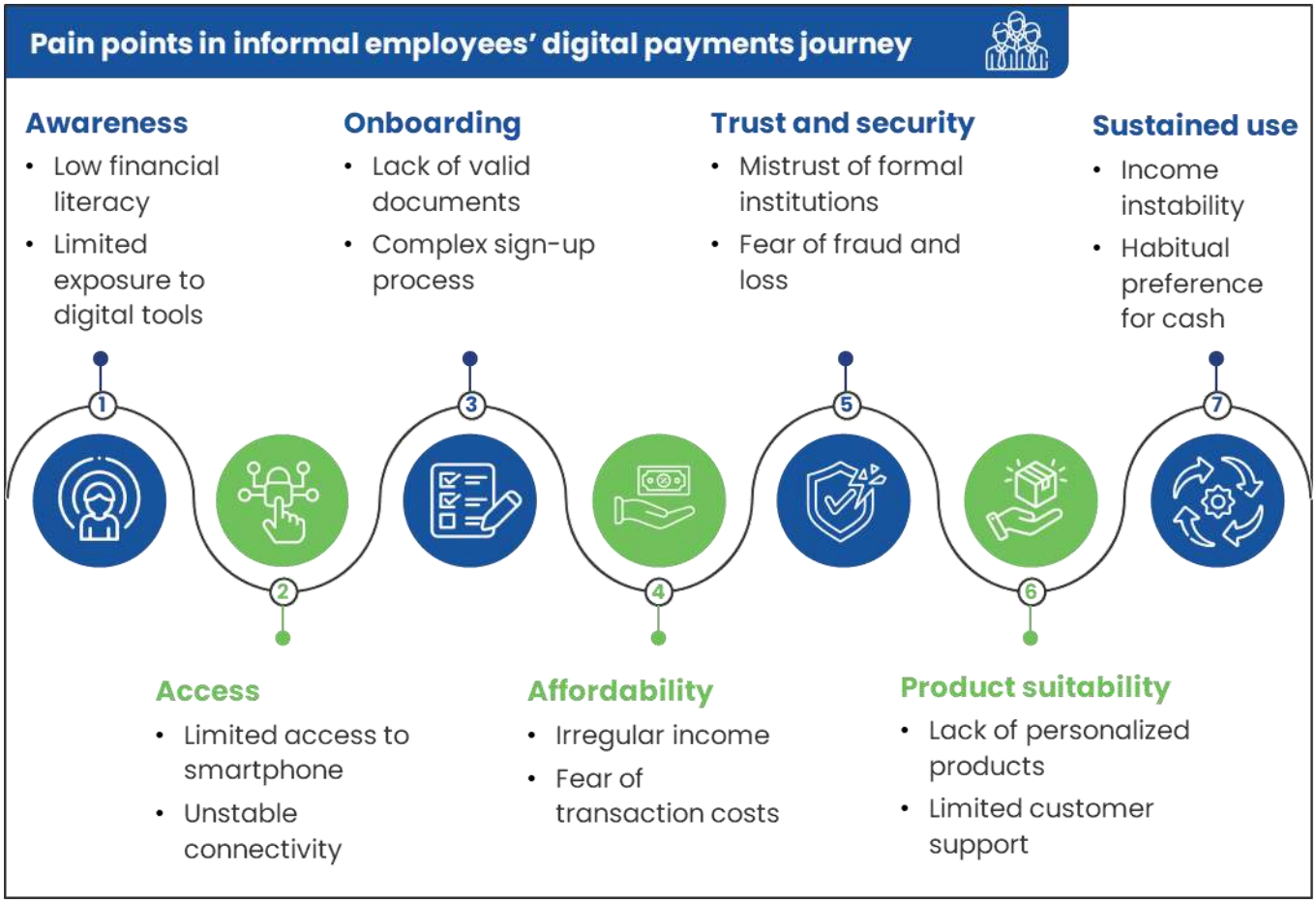


Figure 5: Pain points in informal employees' DFS inclusion journey

Despite these needs being well-understood, their actual participation in digital finance remains constrained by persistent challenges.

Key customer-level challenges:

- Irregular cash flows: Daily wagers and informal workers cannot commit to fixed EMI schedules or minimum balance accounts as they often receive varying income amounts that depend on the number of hours worked or tasks completed each day and at irregular intervals. As a result, they continue to rely on cash, which provides them with immediate liquidity and flexibility to meet urgent household needs whenever they arise.
- Difficulty in remittance: Informal workers often struggle to send or receive money due to limited access to formal remittance channels, high transaction costs, and a lack of necessary documentation. Many rely on informal and less secure methods that are costly and slow.

- Low awareness and literacy: Many workers lack both formal education and practical exposure to digital tools. They often do not understand how UPI transactions work, what PIN protection means, or why sharing an OTP is risky. Even when they are given access to basic services, they hesitate to use them because they are unsure about the process, afraid to make mistakes, or worried they will lose money without recourse.
- Distrust of formal systems: Negative perceptions of hidden fees, penalty charges, or failed transactions create strong perceptions that digital payments cannot be trusted. As a result, they avoid to adopt digital financial products.

Key provider-level challenges:

- Inflexible product design: Formal financial products are usually created with salaried, middle-class customers in mind, steady incomes, reliable documentation, and smartphone ownership. For informal workers with variable daily earnings, limited paperwork, and sometimes only a basic phone, these requirements make the products inaccessible in practice. This mismatch between product design and customer realities excludes a large segment of low-income users.
- Inconsistent service quality at agent points: Banking correspondents, who often serve as the most visible point of access for financial services in low-income communities, are not consistently equipped to meet customer needs. Many work with limited cash availability, insufficient training, and poor product knowledge, which causes delays and transaction failures. This erodes trust and discourages repeat usage.
- Operational inefficiencies: Processes, such as onboarding or KYC verification, often require significant time and repeat visits, which are difficult for workers with long, inflexible work hours. Technical failures and transaction errors, sometimes due to weak connectivity or system downtime, cause delays to receive funds. Each failed attempt reinforces the perception that digital channels are risky compared to cash, which settles instantly every time.

Key ecosystem-level challenges:

- Merchant acceptance gaps: Informal workers typically operate in cash-dominant ecosystems where small vendors resist digital payments. This resistance stems from perceived costs, such as transaction fees and device rentals, complexity to use digital systems, and lack of trust in the timely settlement of digital transactions.
- Infrastructure fragility: Even when informal workers have digital access through phones, weak or unstable mobile connectivity in peri-urban and semi-rural areas causes

frequent transaction failures or interruptions. These disruptions undermine trust in digital systems as reliable payment modes since cash transactions are instantaneous and infrastructure-independent. This fragility directly impacts workers' ability to adopt and regularly use digital financial services.

- Scattered outreach: Financial inclusion and digital literacy campaigns have often failed to target informal workers effectively with relevant and relatable messages. Such campaigns sometimes fail to address immediate financial concerns, fears, or practical barriers, such as transaction failures or penalties. This disconnect limits awareness and sustained engagement with digital finance among informal workers.

India's digital payment ecosystem has expanded rapidly, but the journey toward true financial inclusion remains incomplete. The analysis of rural households, women, the elderly, and informal workers shows that access alone is insufficient without efforts to address structural, socio-cultural, and occupational barriers that limit meaningful participation. Geographic remoteness, low literacy, irregular incomes, gender norms, and age-related constraints intersect with gaps in product design, agent networks, and infrastructure to perpetuate exclusion. These challenges highlight that one-size-fits-all solutions cannot bridge the participation gap. Instead, targeted, context-specific interventions, whether through vernacular and voice-based interfaces, flexible products for volatile incomes, age-sensitive safeguards, or localized agent and merchant networks, are essential to move from mere account ownership to active, confident usage. Only by dismantling these layered barriers can digital finance fulfill its promise to empower every segment of society and drive inclusive growth.

Section 2: From barriers to bridges: AePS at the last mile

While UPI has become the engine of India's digital payments revolution and transformed how millions pay and transact across urban and semi-urban markets, its reach is still uneven. Barriers, such as limited smartphone access, low digital literacy, language constraints, affordability challenges, and distrust, continue to exclude vast segments of the population. For these communities, a different kind of gateway is needed.

This is where the *Aadhaar*-enabled Payment System (AePS) and the Business Correspondent (BC) ecosystem play a crucial role as this gateway. They extend the promise of digital payments to those who might otherwise remain at the margins. AePS offers a bridge into the digital economy for first-time and hesitant users by combining biometric authentication with assisted transactions through locally embedded agents. In fact, cash withdrawals and money transfers through AePS, along with peer-to-peer transactions on UPI, often serve as the initial entry points, which provide low-friction use cases that help onboard new users. For many segments, AePS is the most critical starting point, which underscores both its role in current adoption and the significant potential to deepen digital payment participation. does not replace UPI but complements it, which fills the last-mile gaps and serves as an essential inclusion pathway until users are ready to engage with app-based, self-service digital payments. AePS and UPI both offer a range of use cases that help both users and non-users advance their digital journey.

AePS: The assisted bridge

AePS is often the first point of entry to use formal financial services for millions who remain outside or on the margins of the digital economy. While UPI assumes access to mobile phones and a basic level of digital confidence, AePS is designed to serve as an assisted mode gateway for underserved populations who face barriers, such as limited digital literacy, a lack of smartphones, affordability challenges, language hurdles, and low trust in app-based digital payments.

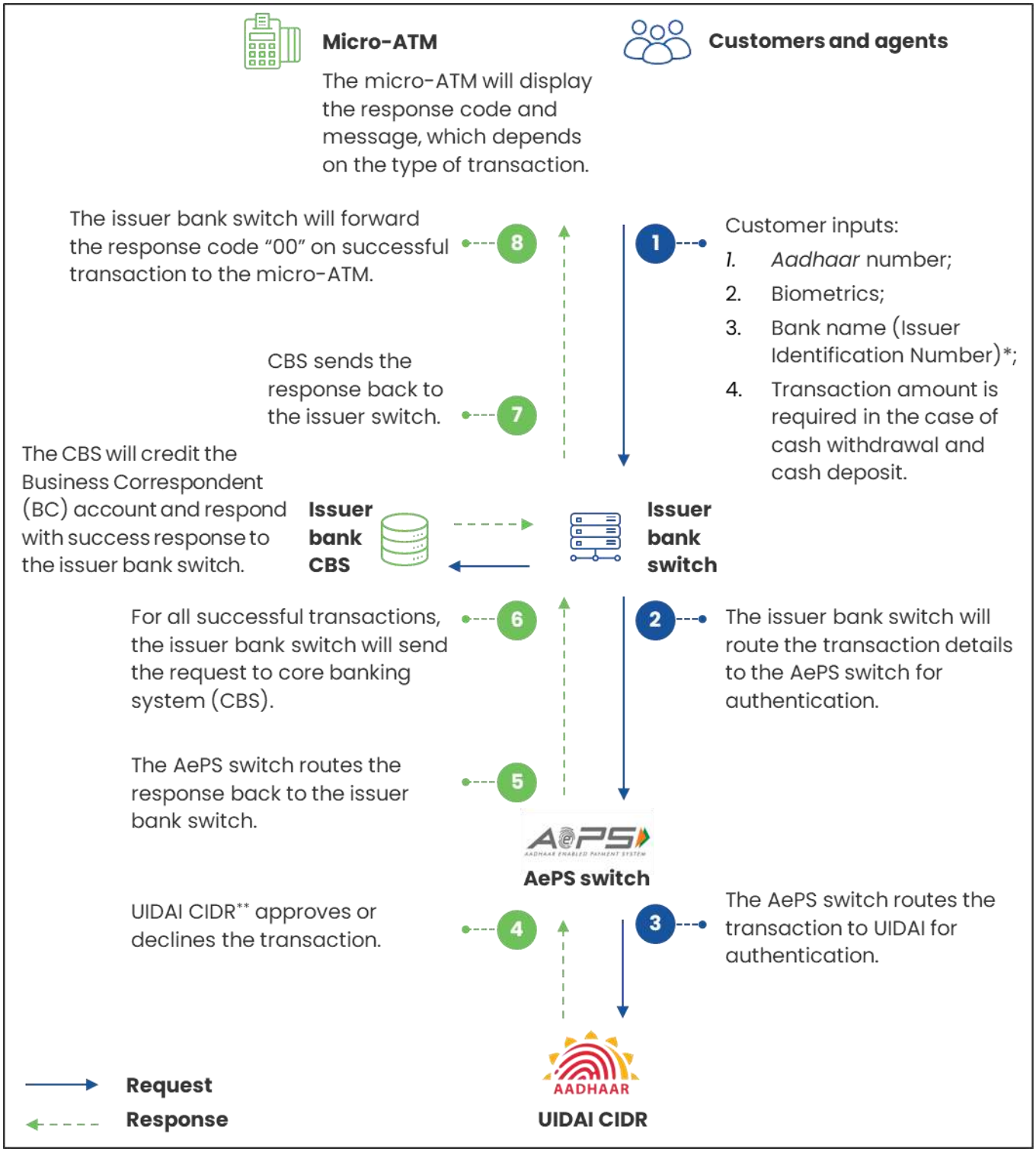


Figure 6: Transaction flow diagram of an ON-US transaction on AePS

AePS operates through an *Aadhaar*-linked bank account and biometric authentication, which allows customers to complete secure and real-time banking transactions. Unlike digital payment systems that rely on smartphones and apps, AePS requires no device or internet access from the customer. Instead, the customer can visit a local BC agent equipped with a biometric device connected to the *Aadhaar* authentication system.

The customer authenticates their identity with a fingerprint or iris scan, which is instantly verified against the *Aadhaar* database. Once authenticated, the customer can perform a range of financial transactions, which include cash withdrawals, deposits, balance inquiries, and fund transfers. The system is interoperable, which means customers can transact at any AePS-enabled outlet, regardless of the bank where their account is held. This simplifies access, particularly in rural or remote areas where traditional bank branches may be scarce.

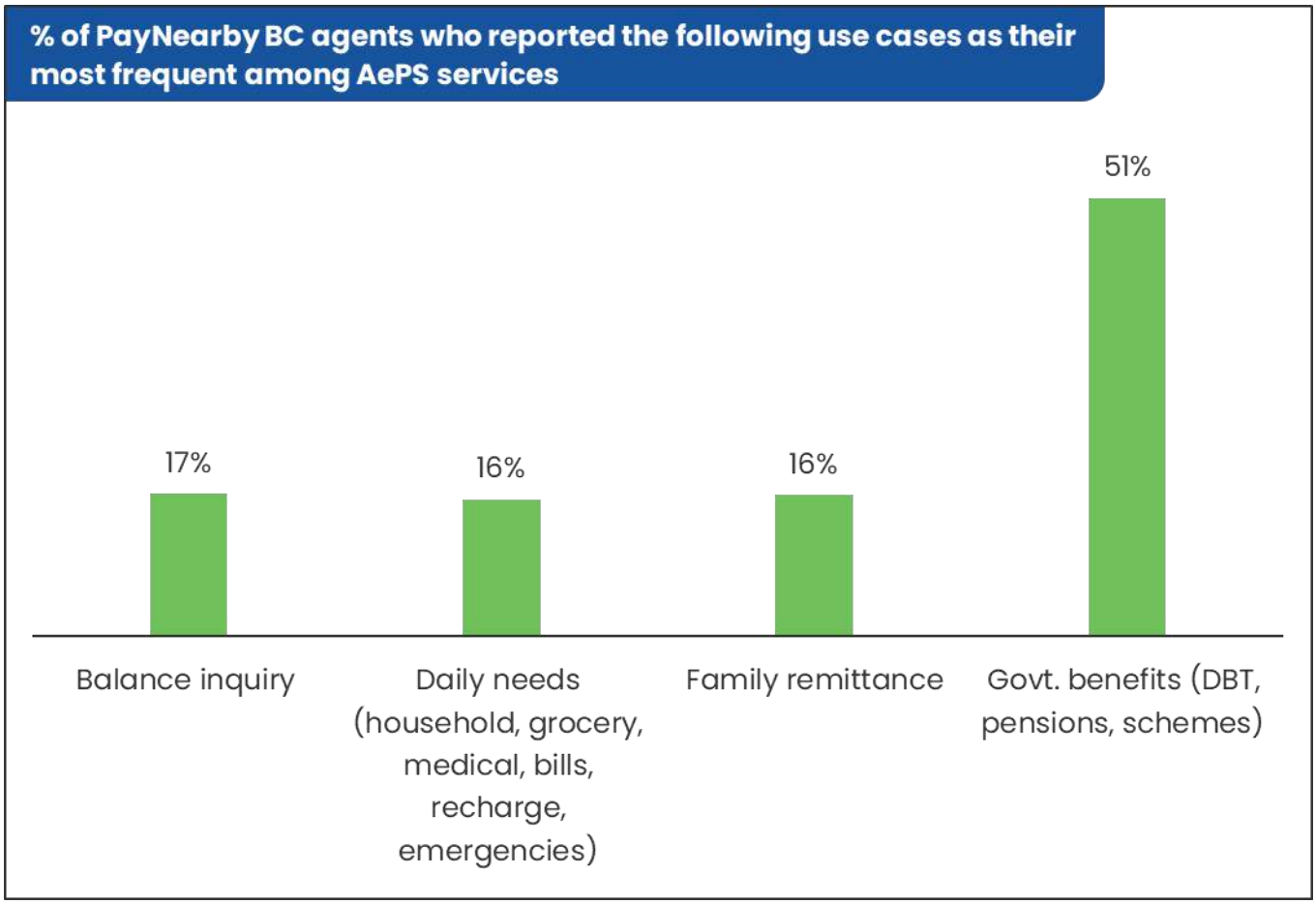


Figure 7: Most frequently reported AePS services (source: survey by PayNearby)

AePS serves multiple functions across India's financial landscape to address the specific needs of various population segments through its biometric authentication capabilities.

- **Direct Benefit Transfer (DBT) cash-out** represents a primary use case for AePS, which enables government beneficiaries to withdraw subsidies, pensions, and entitlements directly from their *Aadhaar*-linked accounts. This system eliminates intermediaries in the disbursement process, which enhances transparency in government welfare programs while it provides last-mile access to funds for beneficiaries in remote locations through the BC network.

- **Accessible points to deposit cash earnings:** AePS offers convenient cash-in points for individuals who earn in cash, particularly in rural areas. It allows them to deposit money into their bank accounts through *Aadhaar* authentication at nearby AePS-enabled points, which facilitate their entry into the formal financial system.
- **Remittances by migrant workers** constitute another application of AePS. The system facilitates interbank fund transfers without the need for debit cards or physical bank visits, which allows migrants to send money to family members in rural areas. Recipients can then access these funds at local AePS-enabled points through biometric verification, which overcomes the limitations of traditional banking infrastructure.
- **Utility payments** emerge as a fourth critical use case, as AePS enables users to pay bills and recharge services. BC agents collect due bill amounts from customers through BHIM *Aadhaar* Pay and process bill payments through Bharat Connect on their BC portal. This functionality transforms BC points into comprehensive financial service centers, where customers can manage multiple payment obligations without the need to travel to urban centers or navigate complex digital interfaces.

AePS reached more than 370 million unique users as of 2023, which primarily serve underserved segments through formal financial services explored in the previous chapter. Data from August 2025 shows that nearly 60% of the AePS transaction volume is processed by customers who hold accounts in public sector banks. These banks have driven the issuance of PMJDY accounts to bring newly banked users into the formal financial system for the first time. Regional Rural Banks handle around 20% of the AePS transaction volume, which focuses on reaching rural customers with localized banking services. Payments banks account for approximately 17% of AePS transactions, which target rural and semi-urban populations underserved by traditional providers through lightweight, accessible banking infrastructure. Private sector banks contribute a smaller share, which accounts for just 2% of AePS transactions. This distribution underscores AePS's vital role to extend banking access across India’s diverse socio-economic landscape, particularly for last-mile users.

The transformation of AePS transaction patterns reveals shifts in India's digital payment ecosystem. Recent data indicate a divergence between transaction value and volume. Although the total value of transactions has declined since 2022, the number of transactions has continued to increase steadily. This trend reflects both regulatory developments and market dynamics that shape the AePS landscape.

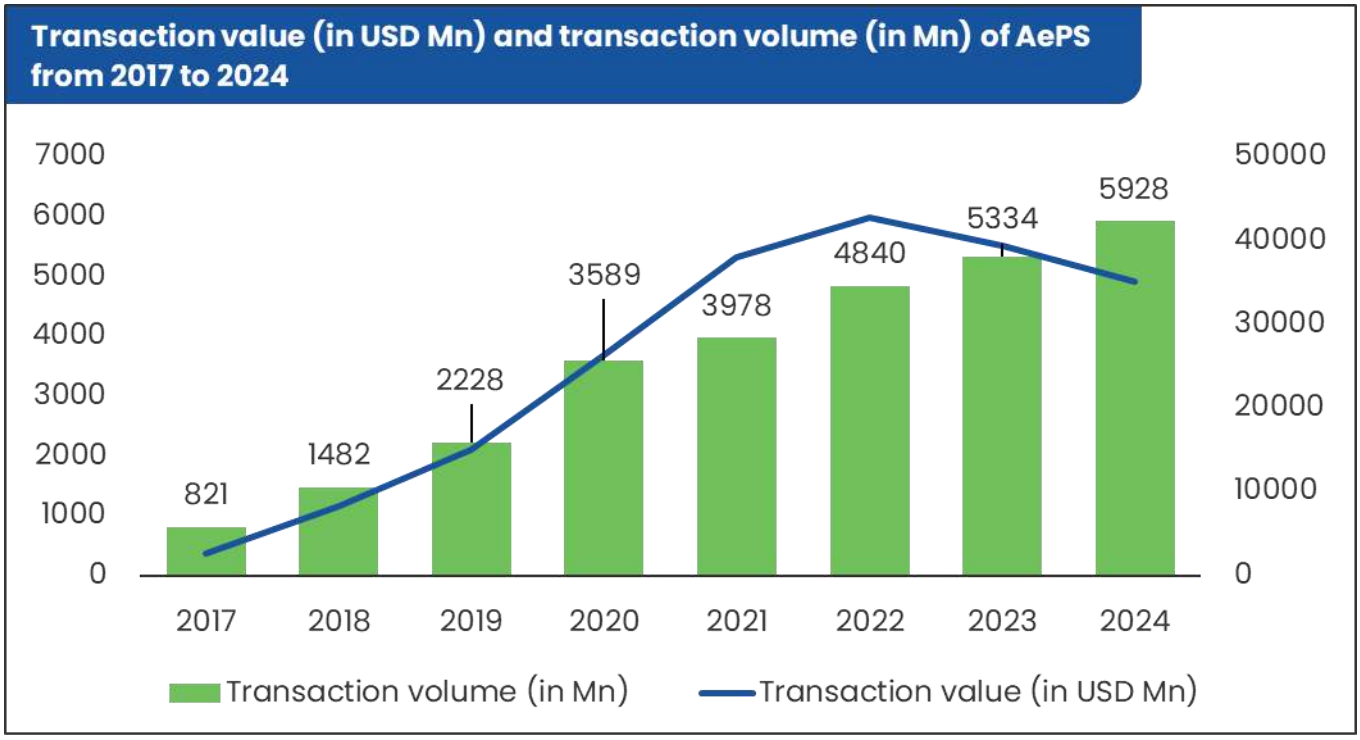


Figure 8: Transaction value and volume of AePS from 2017 to 2024 (source)

Transaction limits implemented by NPCI, which include a daily cap of INR 50,000 and a withdrawal limit of INR 10,000 at Micro ATMs, have constrained high-value transactions. Simultaneously, concerns about biometric fraud, which accounts for 11% of cyber-enabled financial crimes according to the Indian Cyber Crime Coordination Centre, have prompted additional security measures that may discourage larger transactions.

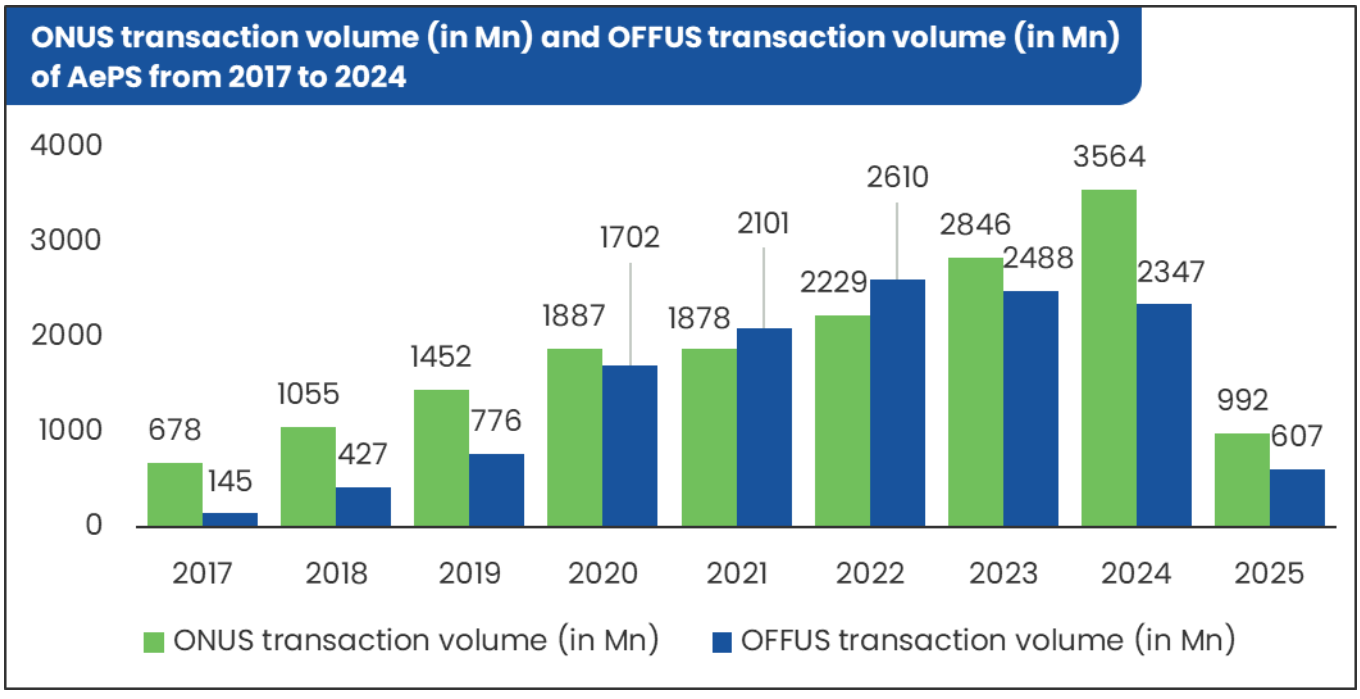


Figure 9: ONUS and OFFUS transaction volumes of AePS (2017 – 2024) (source)

The composition of AePS transactions has also transformed, with ONUS transactions (where customers use their bank's agents) increasingly surpassing OFFUS transactions (where customers use agents from other banks). This shift reflects strategic initiatives by banks to expand their BC networks, which enables them to retain transaction fees, gather customer data, and strengthen their rural presence while it meets financial inclusion mandates.

How AePS addresses financial inclusion barriers

AePS was designed to address fundamental barriers to financial inclusion through a simple, secure, and assisted transaction environment that meets the specific needs of these underserved groups. AePS seeks to overcome technological, economic, linguistic, and trust-related hurdles that limit inclusion in the digital financial ecosystem.

The key barriers AePS targets and how it effectively bridges these gaps are as follows:

- **Assisted biometric-based systems to solve low digital literacy:** A major portion of the population lacks familiarity with smartphones and digital applications, which can make self-service digital payments a challenge or impossible. AePS addresses this issue by offering biometric-based authentication, a method that is intuitive and requires minimal user input. Users can authenticate with fingerprint or iris scans, which eliminates the need to navigate complex menus or remember passwords and PINs. This simplicity transforms digital banking from a technical challenge into an accessible service.
- **Agent-driven structure to account for users who lack device and connectivity access:** Many underserved users cannot afford smartphones or stable internet connectivity required for app-based payments. AePS shifts the technology burden to agents, who possess the biometric devices and internet access necessary for transactions. Customers benefit from a device-free experience, which enables real-time banking services without the need to own or operate any technology themselves. This design choice significantly lowers the economic barrier, making digital finance accessible to those previously limited by cost and connectivity.
- **Human interface to bridge language and comprehension gaps:** Digital payment apps often function primarily in a limited number of languages, with interfaces and terminology that may be unfamiliar or confusing to many users. AePS transactions take place in the presence of local agents who communicate in the customer's native language or dialect. This human interface ensures that users fully understand each step of the transaction, from authentication to confirmation, which reduces confusion and errors. The agent's support personalizes service and brings clarity to the digital process.

- **Embedded physical interactions at local touchpoints to resolve trust deficits:** The invisible and remote nature of app-based transactions can provoke distrust or fear among first-time or low-literacy users, who may worry about fraud or errors. AePS builds trust as it embeds transactions within physical interactions at trusted local agent outlets. The agent's presence, coupled with visible transaction outputs, such as printed receipts or verbal confirmations, makes the process transparent and reassuring. This face-to-face involvement fosters confidence and encourages continued engagement with digital financial services.

One of my sisters had no savings and was divorced. She started to visit my center after she saw other customers. I helped her open a bank account, and she was soon able to access ATM cards by herself. Of course, she still comes to me for certain services, but now she has become independent and uses banking services confidently.

- Pooja Patel (BC agent from Bada, Varanasi)

Figure 10: Quote from a BC agent on how AePS resolves inclusion barriers

AePS shows that financial inclusion is about the creation of a system that meets people where they are by blending the human touch with digital rails. This ensures banking is secure, accessible, and truly inclusive for underserved communities.

Bringing banking to the doorstep: The role of BC agents

BC agents serve as the critical link between formal banking institutions and underserved communities, especially in remote or rural areas where traditional bank branches and ATMs are scarce. Through the AePS, BC agents enable secure, convenient, and biometric-based banking transactions, such as cash deposits, withdrawals, fund transfers, and balance checks, using only the customer's *Aadhaar* number and fingerprint. These agents bring banking services directly to the doorstep as they operate locally with micro-ATMs and handheld devices, which eliminates barriers of distance, digital literacy, and trust. Often, as residents of the same communities they serve, BC agents provide personalized assistance that simplifies transactions and fosters confidence, especially among marginalized groups, such as women and the elderly. This model transforms banking from a distant, complex process into an accessible, trusted, and inclusive service, which drives financial inclusion at scale.

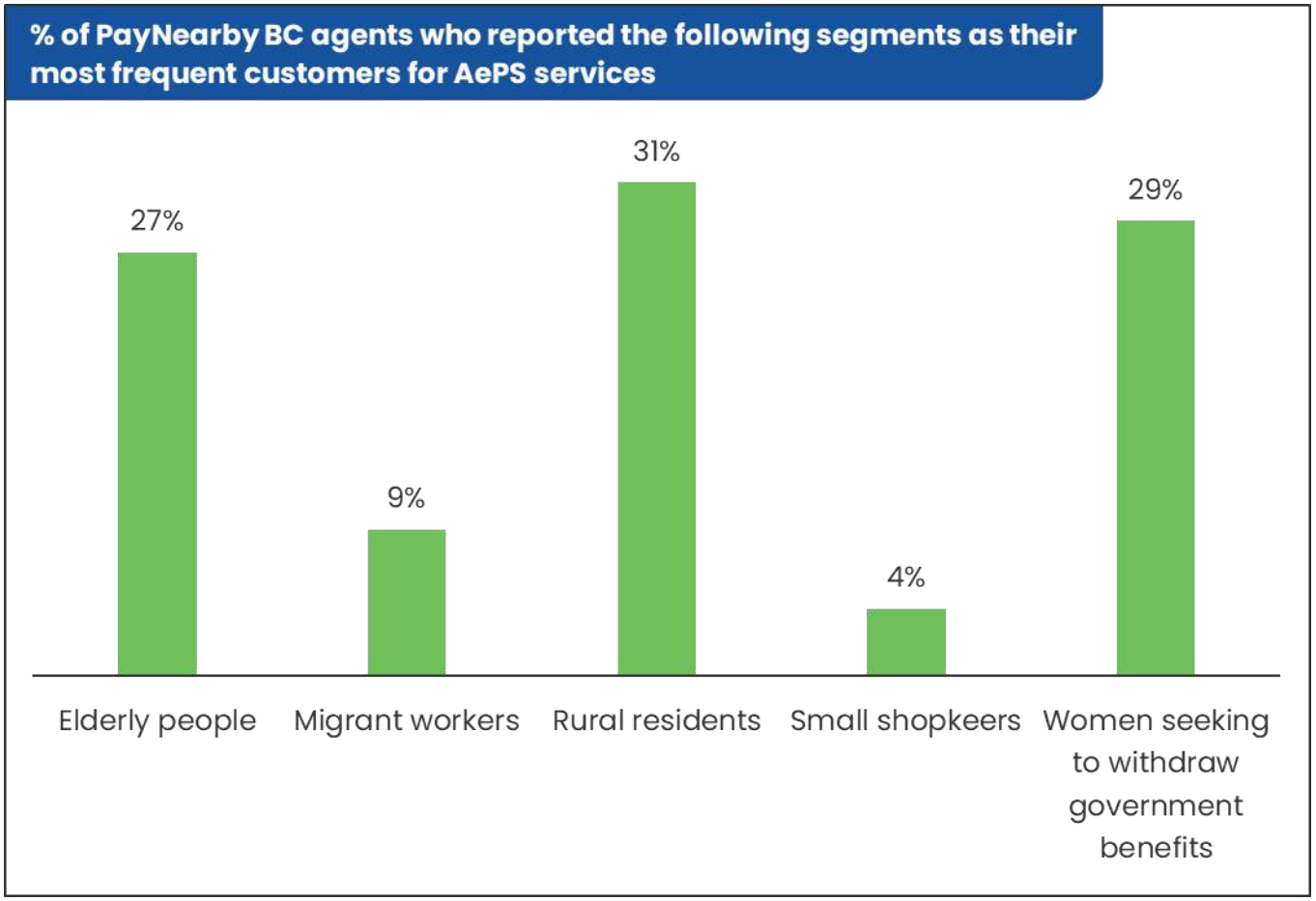


Figure 11: Most frequently visiting customer segments as reported by BC agents

The key barriers addressed by agents include:

- **Physical access to financial services:** In many rural and remote areas, bank branches and ATMs are limited or non-existent, which forces people to travel long distances for basic transactions. BC agents act as local banking outlets equipped with AePS devices. They bring deposits, withdrawals, and government benefit payments closer to home. For example, in flood-prone regions, the continuous presence of BC agents ensures that residents can still receive pensions and emergency funds despite physical isolation.
- **Simplified transactions for all levels of digital literacy:** Traditional banking interfaces and digital services often prove complex for individuals with limited education or experience with technology. AePS, combined with the guidance of a trusted BC agent, allows customers to complete secure transactions with just their *Aadhaar* number and fingerprint. This assisted approach has enabled elderly pensioners and illiterate farmers to access their funds with confidence, which offers a straightforward alternative to complex digital systems.

- **Trust through local agents:** Trust is a fundamental barrier for many to adopt formal financial services, especially in communities wary of banks due to past negative experiences. BC agents, often members of the same community and frequently women known as BC Sakhis, create a trusted link as they provide transparent, personalized service. Their presence fosters confidence and encourages regular use of financial products. Female BC agents have been particularly effective when engaged with women who prefer to transact with someone they know and trust.
- **Social and gender barriers:** Women and marginalized groups face additional challenges to access financial services due to socio-cultural norms and mobility restrictions. Female BC agents have improved access for women by offering culturally sensitive, doorstep services. Their work has contributed to an increase in women's financial participation; on average, female BC agents attract about 51% women as customers through new accounts, compared to around 40% through male agents. In Uttar Pradesh alone, more than 50,000 women trained as BC Sakhis have facilitated transactions worth more than INR 316.26 billion, which empowers rural women while expanding financial inclusion.

AePS, supported by the BC network, has proven that the pathway to digital finance for underserved communities must begin with simplicity, trust, and human assistance. It has created the first touchpoint with formal finance for millions who lack the confidence, devices, or literacy to engage independently, as it enables people to transact through familiar local agents with nothing more than *Aadhaar* authentication. This early exposure builds familiarity with digital systems, reduces fear of technology, and establishes habits of cashless transactions in environments where cash has long dominated. Over time, such assisted interactions can act as a springboard to prepare users to transition toward UPI and other self-initiated digital payment platforms. In this process, AePS is not the end-state of inclusion but an essential bridge to an entry ramp that transforms hesitant first-time users into confident digital participants.

Section 3: The roadblocks that hold back AePS' potential

Even though AePS has extended digital payment access to millions of underserved customers, several gaps limit its reach. We identified where and why many customers discontinue their engagement with AePS when we trace a typical user's journey, from when they search for an agent touchpoint to when they initiate transactions and attempt to expand digital usage. The analysis draws on user stories and frontline agent experiences to illustrate how agent attrition, technical failures, fraud concerns, and interoperability constraints create drop-off points that erode trust and deter broader adoption.

As established in previous sections, three challenges continue to hinder underserved populations' ability to fully engage with digital payments: limited access to banking touchpoints at the last mile, low digital literacy, and persistent mistrust or fear of monetary loss. AePS, supported by the agent banking network, helps address these barriers through greater access, user assistance, and gradual trust-building. However, systemic and operational issues still hold back many users when they attempt to initiate or complete their digital journey. In our analysis, we identified key drop-off points along various milestones of AePS user journey and investigated the reasons for their occurrence.

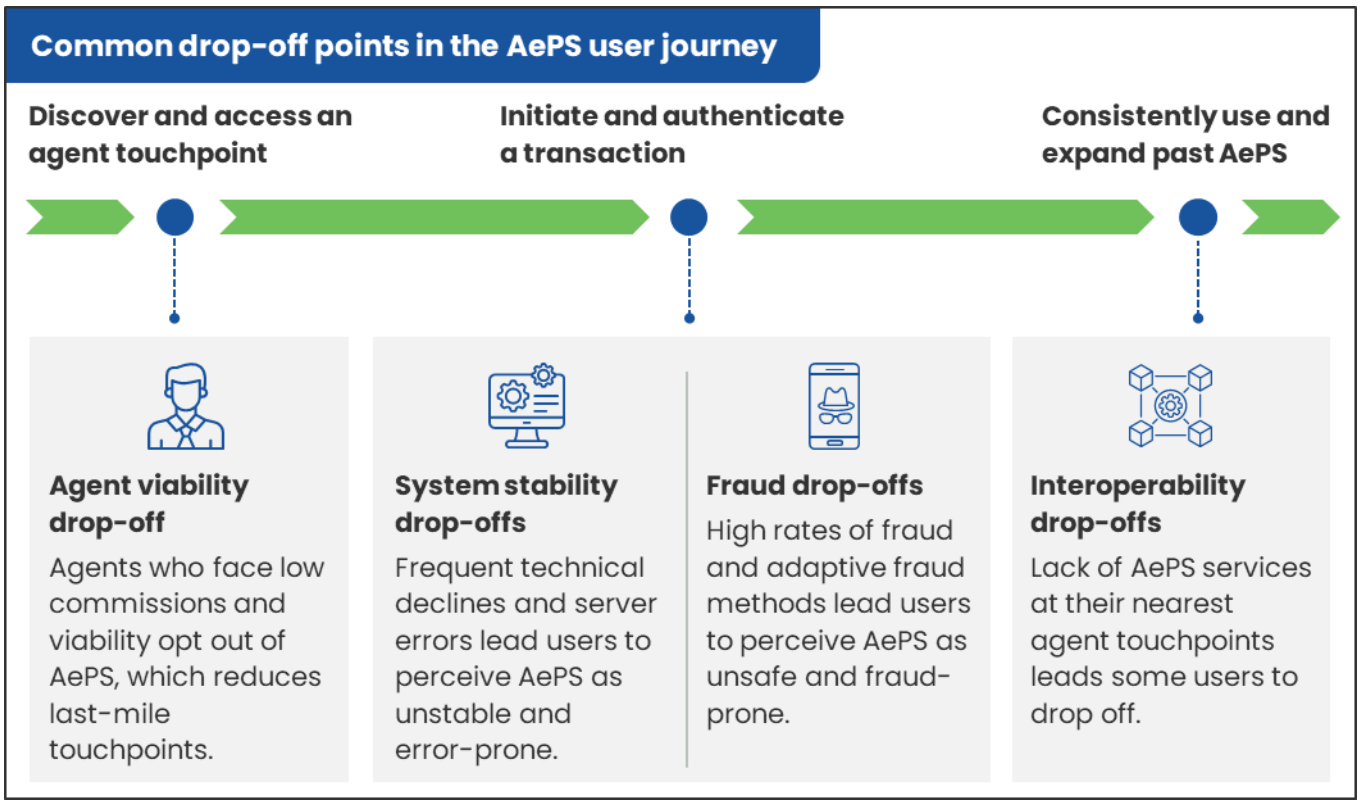


Figure 12: Common drop-off points in AePS customer journey

Milestone 1: How to discover and access an agent touchpoint

Two key factors are essential to reach the first milestone as an AePS user: a BC agent outlet within a reasonable distance and awareness of the payment services available at that location. Awareness is often spread through word-of-mouth and agent-driven promotions. However, the viability of an agent's business is a critical challenge. When commissions are low or incomes are unpredictable, agents no longer serve AePS customers or exit the business entirely, which erodes access for new users.

Figure 13: Prerequisites for customers to discover and access an agent touchpoint

Agent viability drop-offs

A combination of interlinked financial and operational challenges undermines agent viability in the AePS ecosystem, which makes it increasingly difficult for agents to sustain their services. The main challenges include:

- **Low and stagnant commissions:** AePS commissions per transaction (typically INR 5–7) have not kept pace with agent operational costs or inflation, which have remained capped and unchanged for years. This is in contrast to steadily increasing commissions for ATM transactions. As a result, about 15–20% of agents earn less than INR 3,000 per month, and 30–35% earn below INR 5,000, which is often insufficient for sustainability.
- **High fixed costs and operational expenses:** Agents must cover rent, basic infrastructure (devices, internet, electricity), and compliance-related expenditures out of their own earnings. These fixed costs quickly erode any marginal revenue gained from transactions in the initial months specifically
- **Liquidity management difficulties:** Many agents struggle to maintain adequate cash flow to serve customer withdrawal needs, especially during peak periods, such as government benefit disbursements. Challenges to arrange, store, and replenish cash

often lead to service disruptions, lower customer satisfaction, and missed business opportunities.

- **Rural infrastructure limitations:** In remote areas, unreliable connectivity, frequent power cuts, and greater distances to banks or hubs for cash management make service delivery costlier and less predictable.
- **High workload with limited security or support:** Agents typically operate seven days a week under high pressure, with little job security, health coverage, or institutional support. Emotional fatigue and the risk of burnout are common, which prompts many agents to reduce AePS services or exit the business.

Impact on users: The cumulative effect of these challenges is significant. As agents exit or scale down operations, accessible touchpoints disappear, which forces users, especially in remote regions, back into reliance on risky cash-based payments. This erosion of agent networks creates critical drop-offs in the digital payment journey.

Milestone 2: How to initiate and authenticate a transaction

Users must overcome a series of prerequisites to initiate and authenticate an AePS transaction. On one hand, a stable internet connection at the agent outlet and an *Aadhaar*-seeded, AePS-enabled bank account are essential. Equally important is the user's intrinsic trust in AePS system, which underpins their willingness to authorize digital transactions. Each requirement represents a critical step in the user's ability to engage successfully with AePS services.

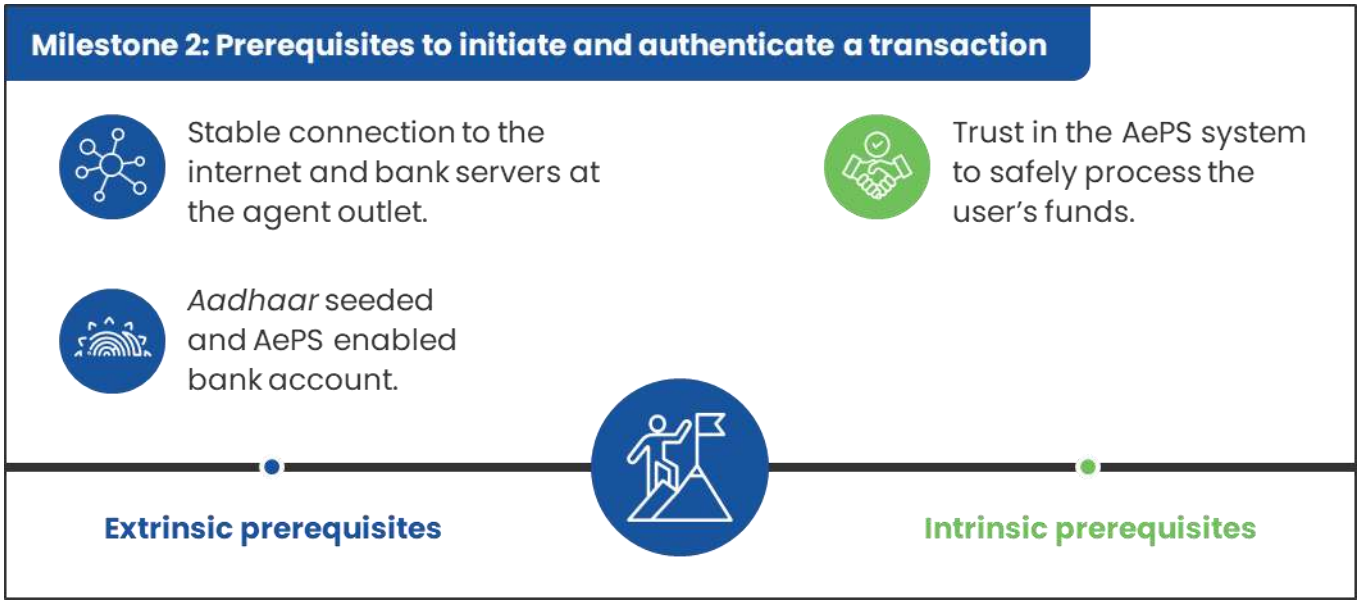


Figure 14: Prerequisites to initiate and authenticate a transaction

System stability drop-offs

System stability drop-offs in AePS user journey refer to instances where technical failures disrupt transaction initiation and authentication, which causes users to lose confidence and abandon digital payments. These failures primarily emerge as high biometric mismatch rates and network connectivity issues at agent outlets. Biometric mismatches, where fingerprint verification fails repeatedly, often temporarily lock agents' devices, which limits transaction capabilities. Network disruptions further increase transaction declines or delays.

of PayNearby BC agents reported that network issues and transaction failures are the main issues their customers face.

The results stem from infrastructure weaknesses across rural areas, such as unreliable internet, aging or poorly maintained biometric devices, and backend system inefficiencies, which contribute to persistent failures. Additionally, the rigid biometric authentication process, which is sensitive to fingerprint quality, exacerbates errors, especially among manual laborers or populations with worn fingerprints.

In my area, AePS allows only three transactions per customer each month, which include balance inquiries. It is very difficult to manage when someone needs AePS service urgently but has already crossed the limit. There are also technical problems, such as frequent failures of L1 devices to read fingerprints, which delay or block transactions. Migrant workers here face even bigger barriers because they cannot open new accounts without a permanent Delhi address, so they end up excluded from these services altogether.

– Deepak Jain (BC agent from Delhi)

Figure 15: Quote from a BC agent on transaction and onboarding barrier

These stability challenges have a direct negative impact on users. Frequent transaction failures undermine trust, which makes users wary of digital methods. They are more likely to go back to cash or purely assisted channels rather than face repeated transaction refusals or delays. For agents, device lockouts and transaction drops reduce earnings and patience, which further lowers system availability. Overall, system instability becomes a critical point of drop-off in the user journey, which hinders the migration of underserved customers into digital payments and undermines AePS's role as a reliable financial inclusion platform.

Fraud-related drop-offs

The digital nature of AePS makes it highly accessible but also introduces new vulnerabilities to fraud. Sophisticated techniques, such as biometric spoofing and social engineering, are increasingly used to bypass security controls. It is often difficult to identify fraud immediately because successful transactions in AePS backend may not align with what customers are aware of or receive as alerts. Many customers do not receive timely SMS notifications, which further hinders the detection.

AePS-related fraud accounted for approximately 11% of India's 1.13 million financial cyber fraud cases registered in 2023, which resulted in losses of INR 823.74 crore (USD 98 million). The majority of these cases originated from states, such as Bihar and Jharkhand. Typical customer losses per incident are reported to be between INR 5,000 and INR 6,000 (approximately USD 60–72). Loss of funds from AePS transactions directly erodes user trust, often pushes first-time digital users back to cash, and limits digital payment adoption, especially among underserved and unserved populations.

Key stakeholders report three broad types of AePS fraud:

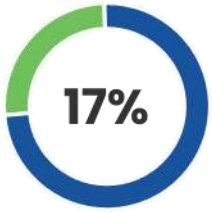
- Agent-initiated frauds, such as agents who sell IDs, fake transaction outcomes to steal funds, or enter higher withdrawal amounts than requested, often target customers with low digital literacy;
- Customer-initiated frauds sometimes involve delayed complaints and chargeback misuse, which occur when agents are unable to verify transaction records;
- Third-party frauds, which include the use of silicon cloning, the exploitation of fingerprints from public records, and the hacking of agent systems through unsecured app downloads.

I constantly fear theft or burglary since I keep cash at my outlet. There is also the constant worry about fake currency or unfamiliar customers who might cause trouble. On top of that, when transactions fail and customers get upset, it impacts my reputation in the community. These challenges are part of the job, but they do add a lot of stress.

- Lucky Sharma (BC agent from Sitapur, Uttar Pradesh)

Figure 16: Quote from a BC agent on security concerns they have

Regulators have responded with onboarding and ongoing agent due diligence, biometric device security upgrades, KYC rules, and fraud monitoring measures. Banks and BCs have enhanced training, monitored geo-locations, limited transaction velocity, and used behavioral analysis to detect abnormal activity. While these actions are critical, their effectiveness to build sustainable trust for last-mile users will depend on continuous vigilance, collaboration, and refinement.



of PayNearby BC agents reported that the fear of fraud and *Aadhaar* misuse hinders their customers to engage with digital payments.

Impact on users: Fear of fund loss prevents potential customers to adopt AePS or leads existing users to go back to cash transactions. For many, AePS represents their first digital payment experience, so fraud incidents can permanently damage their trust in digital financial services. The resulting drop-offs reduce system utilization, hinder financial inclusion goals, and limit AePS's capacity to serve India's underserved populations effectively.

Milestone 3: Consistent use of AePS and expansion into other digital financial services

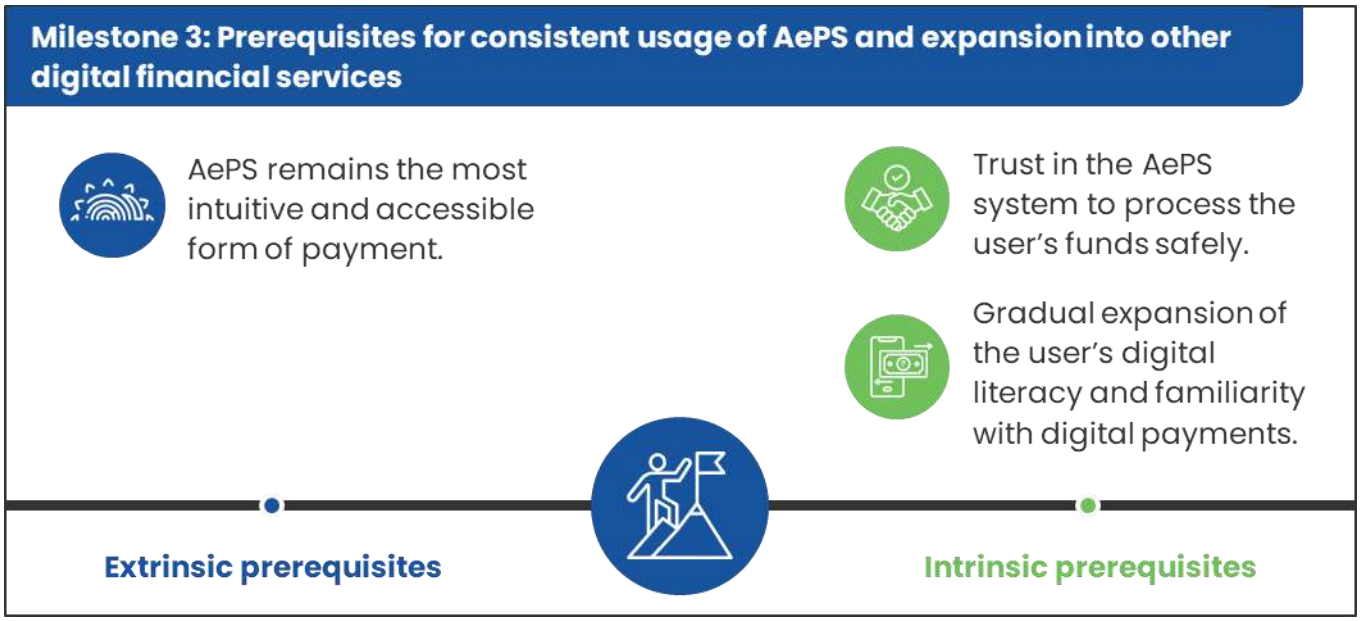


Figure 17: Prerequisites for consistent usage of AePS and expansion into other digital financial services

Interoperability drop-offs

Interoperability is a core strength of AePS, which enables users to access funds across banks, regardless of location or agent affiliation. AePS network includes 153 member banks, with public sector banks holding approximately 77% of PMJDY accounts and dominating the issuer side. However, the on-ground accessibility of AePS depends on a balance: while PSU banks issue a large proportion of accounts, private sector banks, payments banks, and FinTechs have invested heavily in wide agent acquisition, which creates the most active AePS touchpoints.

In principle, these interoperable networks should enable users to transact at their closest agent, regardless of which bank issued their account. Yet, PSU banks often restrict "OFFUS" transactions where customers use agents outside their issuing bank's network. These restrictions disproportionately impact low- and middle-income users, which forces them to take long and costly trips to issuer-aligned agent outlets. For instance, a migrant worker with a PSU-issued account may have to travel many kilometers to find a suitable agent, which undermines the system's goal of inclusion.

Two main factors explain these restrictions.

- First, PSU banks enforce stricter policies to mitigate fraud risk, which assumes private sector agent onboarding practices are less rigorous;
- Second, OFFUS transactions create a financial burden, as PSU banks pay an interchange fee (0.25%) for every such transaction, which adds up to billions in annual costs. Banks respond by default by disabling OFFUS access, imposing higher transaction charges, and requiring complex in-branch activation processes, which are often poorly communicated to rural customers.

Implementation barriers also include tighter biometric authentication for OFFUS transactions, which leads to higher rates of failed authentication at third-party outlets.

Impact on users: The cumulative effect on LMI customers is reduced accessibility, limited financial flexibility, and decreased customer choice. Restricted interoperability compels many to switch banks based solely on agent proximity, rather than their actual service needs, which ultimately hinders the mission of AePS to drive financial inclusion at scale.

Despite its promise as a vehicle for last-mile financial inclusion, AePS faces multiple ecosystem barriers that hinder its full potential. Agent attrition, system stability failures, fraud risks, and interoperability restrictions each create drop-off points for underserved users along their digital journeys. These challenges push users back to cash reliance, which erodes the incremental trust built in digital payments. To address these systemic gaps, it is crucial to expand digital financial services and ensure that AePS remains a meaningful and reliable bridge for India's underserved populations as they transition to broader digital engagement.

Section 4: Graduation pathways, and how we get there?

UPI and AePS are foundational pillars in India's digital payments journey. Yet they serve different user segments at various stages in their digital journeys. For many urban and digitally literate customers, UPI serves as the natural start to engage with digital finance. However, UPI requires a smartphone, an active bank account linked to the app, internet connectivity, and a basic level of digital literacy. As a result, UPI remains inaccessible for substantial segments at the last mile: rural, elderly, low-income, and less formally educated populations. While solutions like Hello!UPI and UPI 123Pay offer alternatives to some of these requirements. Yet their limited uptake suggests that the familiarity and trust barriers are substantial challenges to the adoption of self-initiated digital payments.

of PayNearby BC agents reported that concern around app interfaces prevents customers to use UPI applications on their own.

AePS, by contrast, is designed with access in mind. It allows banking transactions through *Aadhaar* authentication and biometric verification. No phone or formal digital onboarding is needed. For the digitally excluded, AePS provides the first step on the digital financial ladder. AePS enables withdrawals, cash-in, and balance checks. The value lies in its potential to act as a digital on-ramp that can gradually bring previously excluded users closer to broader digital engagement, and bridge them to platforms like UPI.

Several mechanisms enable AePS to serve as this bridge:

- **The use of AePS creates basic transaction familiarity:** When users visit a local agent and authenticate with biometrics for services, such as government benefit withdrawals or deposits, users gain a firsthand sense of digital financial flows. They become familiar with how funds are credited, receipts produced, and balances updated electronically, even if an agent facilitates all steps.
- **Agents themselves play a critical role as trusted guides:** In rural and underserved areas, local agents often have a deep knowledge of their customers and are deeply embedded in community life. Their assistance helps users overcome literacy and confidence barriers: an agent may explain what a transaction is; demonstrate how

authentication works; answer questions on where money comes from or goes; and build positive experiences that underpin trust in digital channels. Importantly, these agents can serve as first teachers for the next step forward, for instance, introduce users to UPI's QR codes or show how peer-to-peer transfers work, even in a hybrid, assisted model. This creates trust in digital payments and the underserved move from the periphery toward financial inclusion.

The effectiveness of assisted payment methods as a crucial bridge between financial non-usage and self-initiated digital payments is demonstrated by global experiences. One of the most instructive being the SmartMoney experiment in Uganda.

Case study: SmartMoney in Uganda

SmartMoney was launched in Uganda in 2012 as a digital financial solution that sought to improve access to formal financial services for rural communities, especially smallholder farmers. The platform was designed to address the problem of cash-based agricultural payments, lack of trust in banks, and limited access to traditional financial services by providing secure, agent-assisted electronic payments and transfers in rural areas.

- Initially, SmartMoney focused on building trust and visibility through local agents, shops, and service centers. Community Operations Managers (COMs) and 38 community representatives registered new users directly in villages, often through face-to-face onboarding and relationship building. Farmers received crop payments digitally into their SmartMoney wallets, which could be accessed through agents or spent in local SmartMoney shops with other users.
- More importantly, all transactions (cash-in, cash-out, peer-to-peer transfers) were offered with no fees for rural users, which significantly lowers adoption barriers for those with small, frequent transactions.
- The transition to self-initiated payments came after awareness and confidence were established through agent touchpoints. Once users became familiar with how to receive payments and complete transfers through agents, many users began to initiate payments within the SmartMoney system on their own, particularly peer-to-peer transfers and purchases in village shops.
- Larger agribusinesses and government agencies reinforced adoption through SmartMoney to pay farmers digitally. This exposure to digital transfers, which sometimes displaced cash entirely in the value chain, created new routines for users, who subsequently began to use mobile wallets for savings and everyday spending.
- As infrastructure and trust with local agents grew, users reported a shift in behaviors from dependency on agents for every transaction to directly manage their own wallet balances and initiate transfers independently.

Figure 18: Case study on SmartMoney in Uganda (source)

AePS touch points inherently create teachable moments. These are opportunities for agents to help users, at their own pace, toward greater independence. As trust builds and users become more curious, agents can explain digital concepts, such as what a UPI PIN is; why a mobile number matters; how to check a mini statement; or how to access a digital wallet. Agents help migrate usage for users who acquire smartphones or increase their comfort with digital transactions. They start with UPI collect requests at the counter and then step-by-step toward self-initiated app-based use.

This ladder approach recognizes that digital journeys are not linear or identical. Some users progress quickly, while others may remain at assisted stages for longer period. Yet AePS, far from being an endpoint, acts as a launch pad: it familiarizes users, helps them, and gradually prepares them for more sophisticated digital interactions. The path from AePS usage to a complete UPI self-service is built on trust, support, relevant use-cases, and repeat digital exposure. Agents and community touchpoints serve as enablers. However, to establish this ladder from AePS to UPI, the barriers outlined in the previous chapter must be overcome. This will allow uptake and sustained usage of AePS to reach scale among the underserved.

Figure 19: Two stages to enhance AePS and maximize its potential

Pathways to scale AePS: overcome barriers

The pathway to enhance the viability of AePS for agents:

To ensure AePS remains a robust and sustainable platform for digital financial inclusion, a multipronged approach is necessary to strengthen agent viability, promote user engagement, and improve system performance. The following enablers can help to address key ecosystem pain points, reduce user drop-offs at the access stage, and enhance overall last-mile service delivery:

- **Strengthen agent incentives and viability:** Regulators can reexamine flat commission caps for AePS transactions and move toward a transaction value-based model

benchmarked against ATM fees. This can be achieved through the setup and enforcement of minimum monthly compensation, insurance coverage for agents, and recognition of their essential role in rural areas.

- **Introduce transparent and performance-based compensation:** The introduction of performance-based incentives and timely recognition for high-performance agents can encourage transaction growth and long-term retention, which supports agent morale and service consistency.
- **Broaden user awareness and drive service uptake:** Banks, Business Correspondent Network Managers (BCNMs), and NGOs can expand user education and literacy efforts to reduce transaction failures and diversify AePS usage. Agents should actively educate users about additional AePS services beyond basic cash withdrawals. These include utility bill payments and fund transfers, which help raise transaction volumes and agent sustainability.

The adoption of these recommendations will directly impact the user's ability to access dependable nearby agents. This will reduce the high drop-off rates observed at the first step of AePS journey and allow the system to achieve greater scale and reliability for India's underserved populations.

The pathway to enhance the security of AePS

A combination of advanced technology, enhanced monitoring, and improved customer engagement is required to strengthen AePS ecosystem against fraud and build user trust. The following recommendations target the root causes of fraud-related drop-offs and offer a layered approach to security and transparency:

- **Implement advanced biometric authentication with liveness detection:** UIDAI and NPCI can collaborate to enhance liveness detection for all AePS transactions, which ensures biometric data originates from a genuine individual. Upgraded fingerprint technology with additional security layers could spot artificial fingerprints.
- **Establish risk-based transaction authentication:** Instead of a “one-size-fits-all” protocol, transactions could be segmented by risk level based on amount, frequency, location, and customer profile. Appropriate security layers are applied, which range from basic biometrics for low-risk transactions to multi-factor authentication or real-time fraud analytics for high-risk transactions. AI and ML-based real-time fraud detection can be implemented.

- **Enhance transaction transparency for customers:** Banks and FinTechs can incorporate voice confirmation of transaction details at the agent outlet in the user's preferred language. Additionally, each AePS transaction can trigger immediate SMS notifications and provide digital receipts with QR-verifiable details.
- **Develop a centralized fraud intelligence system:** Ecosystem players can collaborate to build a shared, real-time database for AePS ecosystem to flag compromised devices and blacklisted agents, as well as to issue live alerts on emerging fraud patterns. Standardized reports can help ensure timely action and robust analysis.
- **Strengthen agent management and accountability:** SIM binding for all agent devices and geofencing could ensure transactions occur only in authorized locations. Remote device controls can be used to lock compromised units, and regular mystery shopper audits can be conducted to detect fraudulent agent behaviors.

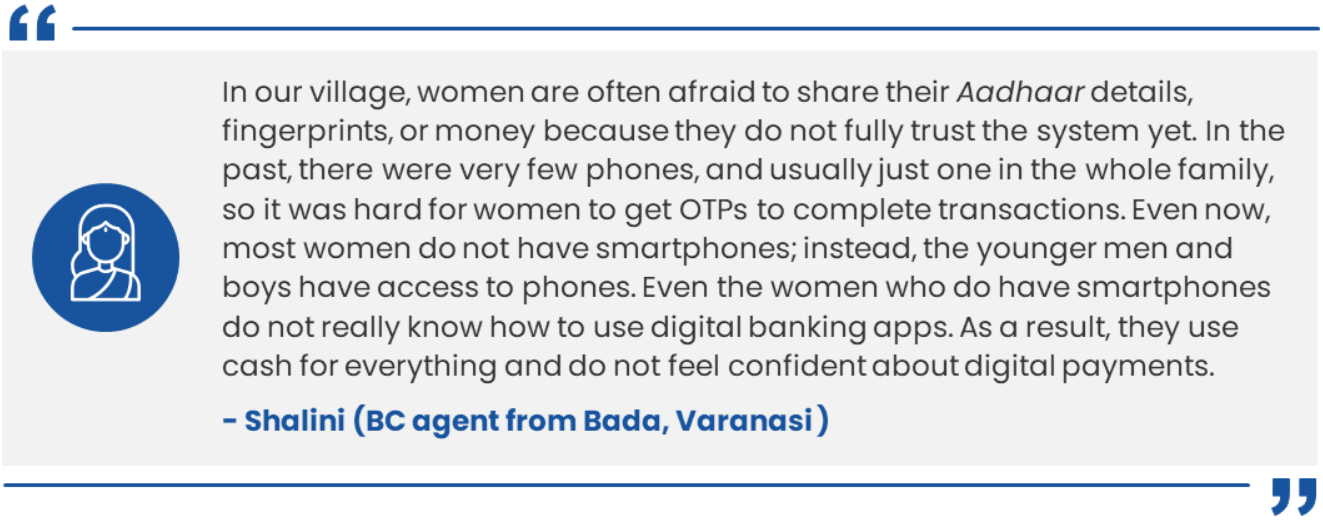


Figure 20: Quote from a BC agent on barriers that hinder their customers' user experience

The pathway to enhance the interoperability of AePS

Specific regulatory and operational reforms are required to optimize AePS interoperability and user experience. The implementation of these measures could improve customer access, reduce transactional barriers, and enhance clarity and trust across the system:

- **Mandate default enablement of OFFUS transactions:** Regulators can ensure that all banks enable OFFUS AePS transactions by default. This would eliminate the need for account holders to visit bank branches for activation, which ensures that users can transact at any agent, regardless of their bank of origin. Banks should provide clear, standardized disclosure of all AePS transaction charges at agent locations, which details ONUS and OFFUS fees. BC agents should verbally inform customers about any applicable charges before they process it for the users to be fully aware of costs.

- **Establish monthly free OFFUS transaction quotas:** Banks should offer a monthly quota of free OFFUS AePS transactions, benchmarked to typical DBT beneficiary and rural customer patterns, such as one to three free OFFUS transactions per month. Higher quotas could be set for customers in areas with low agent coverage to support greater flexibility.
- **Create regular industry roundtables:** Regulators can facilitate collaborative forums for all stakeholders, which include public and private banks, FinTechs, BCNMs, and other relevant parties, to address interoperability and security risks. These roundtables allow agents to share the best practices on agent vetting, onboarding, monitoring, and fraud mitigation. They also facilitate consensus-building for standards related to transaction monitoring and agent due diligence, which helps the issuers overcome perceived risks that can otherwise limit interoperability.

These recommendations help ensure that last-mile users can reach and benefit from accessible agents by making OFFUS access more straightforward, fees more transparent, and industry dialogue ongoing. This addresses a major driver of drop-offs in AePS user journey.

The implementation of these recommendations can help resolve critical bottlenecks in AePS ecosystem and enable it to scale effectively. Default OFFUS enablement, price transparency, free transaction quotas, and regular industry collaboration will allow a more accessible and trustworthy agent network to emerge. This expanded and reliable access at the last mile can bring more underserved populations to the foot of the financial inclusion ladder.

Build a graduation ladder for AePS users to UPI

AePS and UPI offer digital payment entry points, yet their user bases and requirements differ. While some digitally savvy users begin directly with UPI, many in underserved segments start with AePS as their gateway to the digital economy.

A profile of graduation-ready AePS users

While AePS will remain the preferred and ideal instrument for a segment of users who primarily rely on it for cash withdrawals and basic banking needs, these users are unlikely to transition away. There exists another distinct user segment with the potential and readiness to graduate towards self-initiated UPI usage. Some characteristics of this segment include:

- **Access to smartphones and data:** Unlike *AePS-dedicated* users, they have built reliable access to smartphones and mobile internet, which is essential for UPI usage. Some BC agents support users to reach this level by onboarding them to short-term savings products, which enables them to gradually save enough to purchase their own

smartphones. Additionally, they might also connect them with financing options for affordable smartphones.

- **Basic digital literacy:** They demonstrate comfort with digital devices and apps beyond the basic biometric AePS interface, which includes some familiarity with smartphones and mobile banking.
- **Trust and openness to digital payments:** They show growing trust in digital transactions and are willing to try new features, such as UPI or other digital payment methods.
- **Economic incentive:** They may see tangible benefits, such as incentives, lower fees, ease, or speed in transition, compared to static cash-out users.
- **Social and peer influence:** Exposure to success stories, peer usage, or support networks that encourage digital graduation.

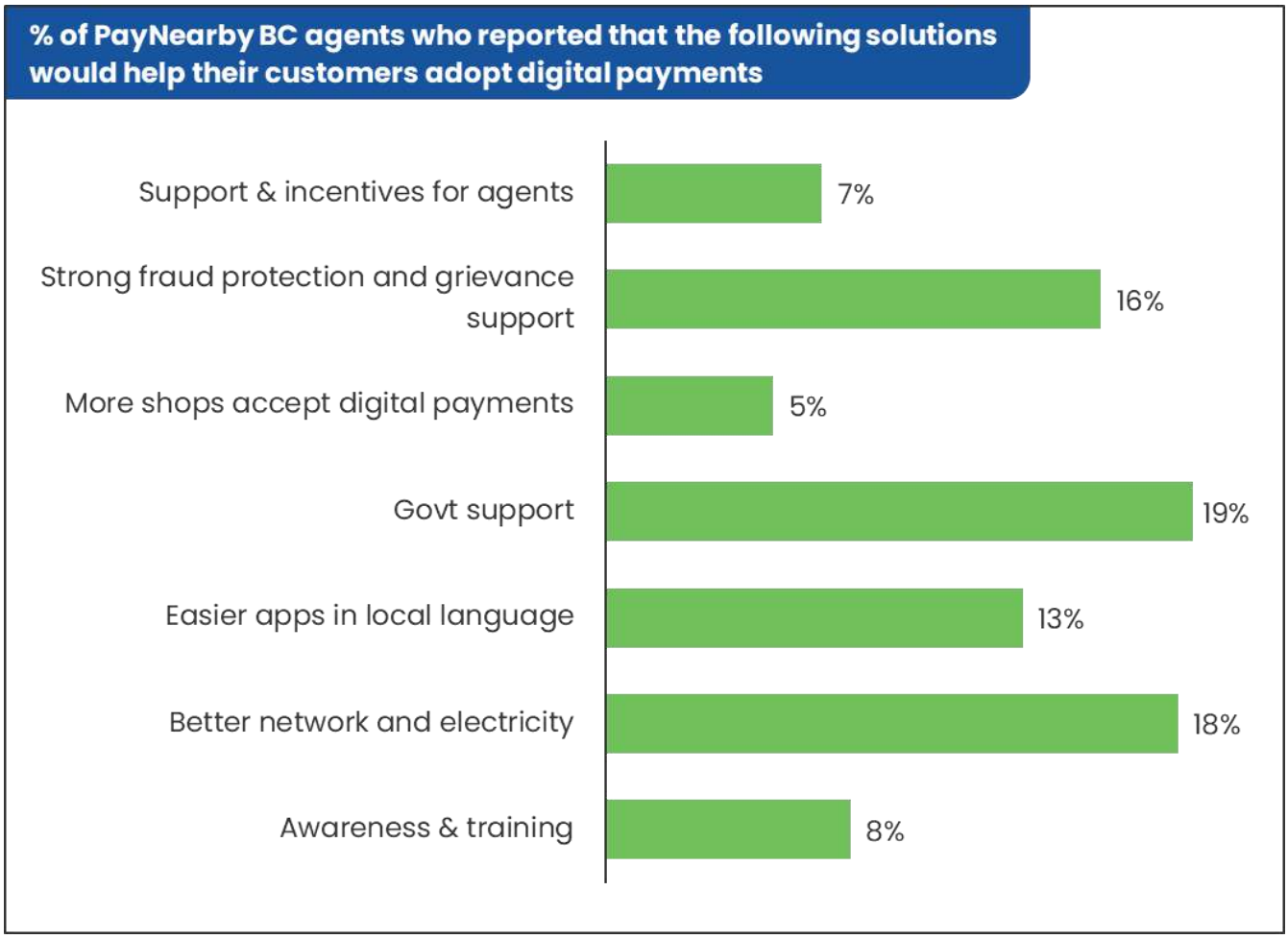


Figure 21: Top solutions to help customers adopt digital payments as reported by BC agents

Four pillars can lay the foundation of a scalable, inclusive progression model to facilitate this digital graduation.

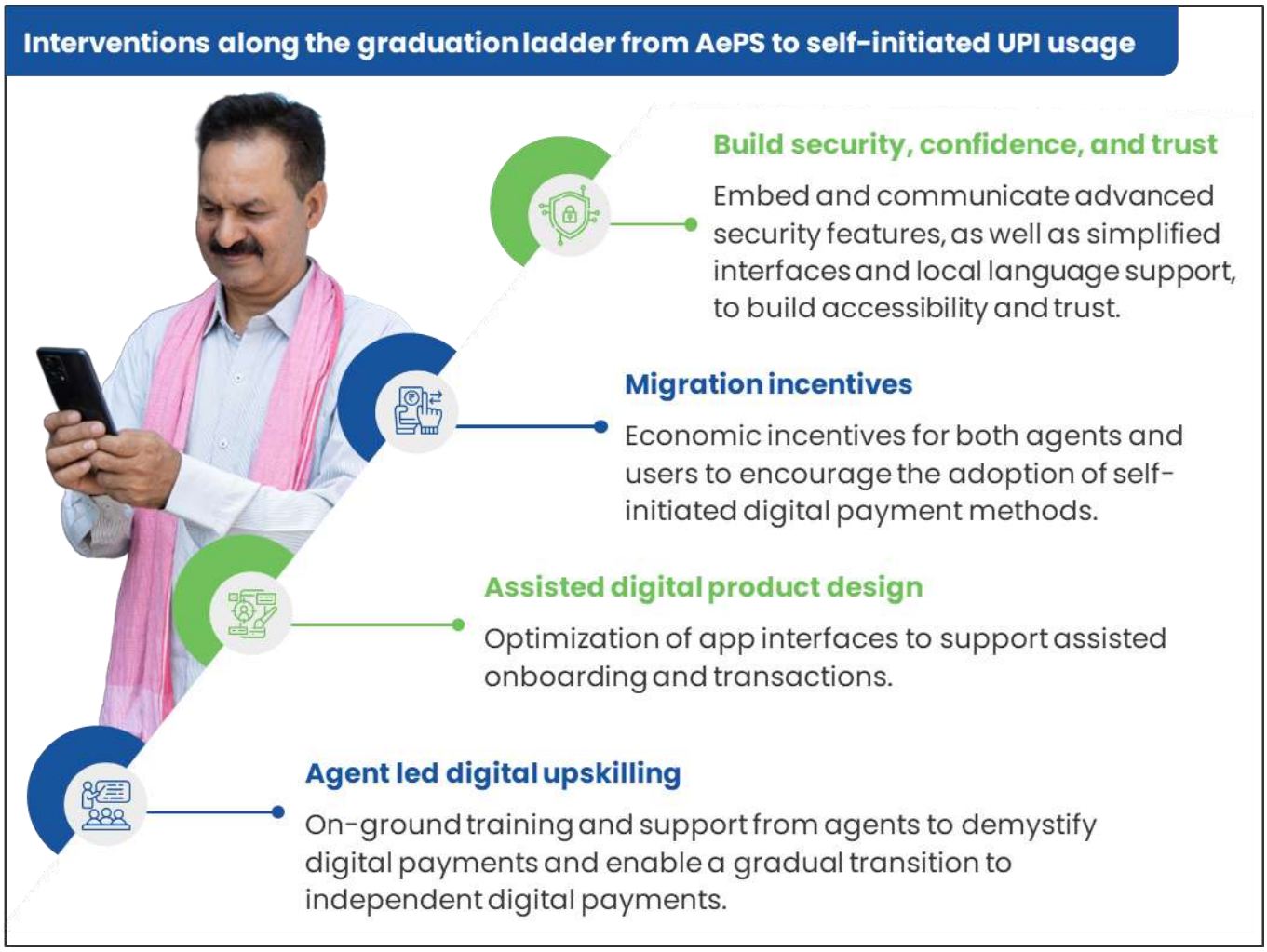


Figure 22: Interventions along the graduation ladder from AePS to self-initiated UPI usage

1. Agent-led digital upskilling and enabling

Agents play a key role to guide users through their digital journey. For customers who have basic digital literacy and trust, agents can actively encourage and train them to use UPI for simple transactions. This on-ground training helps demystify app features and PIN usage, which enables users to gradually transition from assisted AePS transactions to more independent use of mobile payment apps. Personalized support at familiar agent outlets builds confidence and reduces fear of errors or fraud.

Specific enabling factors can include:

- Agents can be empowered by banks, BCNMs, and FinTech partners through training programs that focus on digital literacy training techniques personalized for users with low literacy levels, which include gender-sensitive outreach to address the unique

barriers faced by women. BC Sakhis and other female agents can particularly help overcome cultural and access challenges that women face in digital adoption;

- They can hold community sessions to demonstrate UPI app functions, conduct one-on-one onboarding at local outlets, and provide step-by-step assistance with PIN creation and QR code payments. This addresses the digital literacy barrier;
- Mobile network providers and government bodies can support these efforts. They can expand mobile or internet access and subsidize devices to provide users with the necessary hardware to participate digitally. FinTechs and banks can roll out goal-based investment products to enable potential users to save up for their own mobile phones.

2. Seamless assisted-digital product design

User-friendly app interfaces and onboarding flows optimized for assisted use are crucial. Design UPI applications to support agent-assisted transactions through simplified steps, localized language options, and guided prompts, create a natural pathway for AePS users to migrate. Provide assisted onboarding to users that can bridge usability gaps. This enables users to learn through practice, rather than fully independent digital skills upfront. Features, such as “interactive walkthroughs” and hybrid transaction modes (agent-assisted + user initiation), reduce UX friction and ease the transition from AePS to UPI. This lowers the digital literacy barrier and also accommodates limited access to personal smartphones through the use of shared devices.

3. Ecosystem-level value propositions for migration

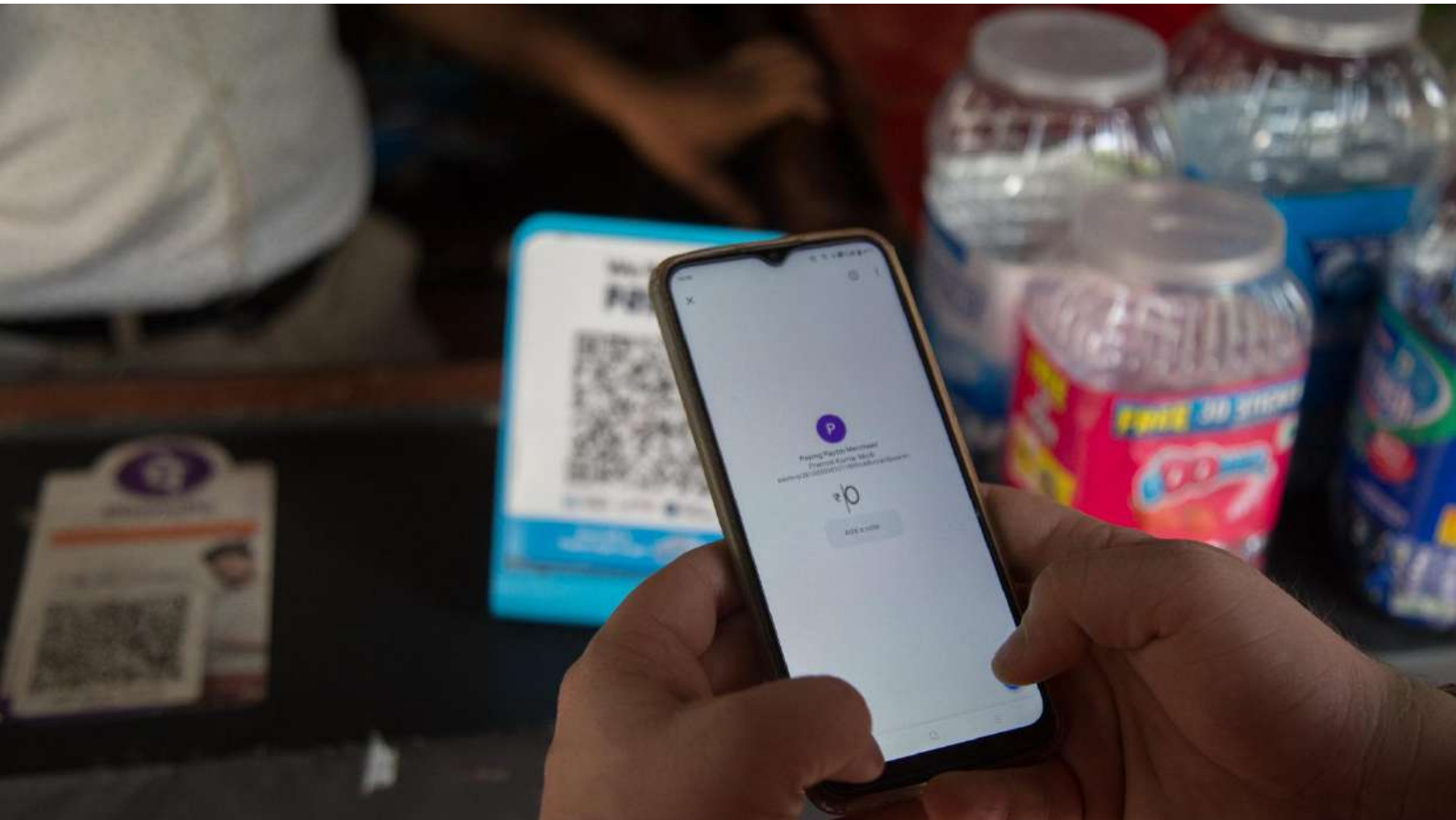
Motivate both agents and users to deepen their digital adoption, which can be achieved through thoughtfully designed value propositions. For agents, public recognition, digital skill certification, access to exclusive training opportunities, or advancement within local agent networks can encourage proactive upskilling and personalized guidance to help users adopt UPI. For customers, interventions, such as priority access to service support, faster resolution of queries, digital literacy workshops, or early access to new digital features, can play a catalytic role to change behaviors. Align these intrinsic and extrinsic value propositions across the ecosystem to meaningfully accelerate progression toward self-initiated digital payment use.

4. Protection, confidence, and UX trust

Address users' security concerns and usability needs, which is fundamental to sustained adoption. Embed advanced security features into UPI channels to safeguard users. Offer

simple language support and local customer care to build accessibility and trust. Clear communication and positive user experiences ensure that customers do not go back to cash or entirely rely on agent-assisted flows. Some additional enablers include banks, regulators, and NPCI, which embeds advanced security protocols (such as biometric authentication, fraud alerts, and real-time notifications) into UPI apps and AePS platforms to protect users. Simple language customer support centers and local helpdesks staffed by trusted community agents can improve accessibility and aid troubleshooting. Transparent communication of security measures, clear grievance redressal processes, and continual user education cultivate confidence and reduce reliance on cash or fully assisted channels, which addresses the key trust barrier.

These four pillars form an interconnected support system that enables users to progress from initial AePS adoption to confident, autonomous use of digital payments. This ladder approach recognizes diverse personal trajectories, with agents and technology that act as enablers rather than barriers. This foundation prepares the ecosystem to deliver on the promise of broader financial inclusion, which empowers every individual to actively engage in India's digital economy.



For millions in India, digital payments entail an uphill battle against distance, low digital literacy, and distrust of unfamiliar financial systems. The whitepaper has traced the systemic hurdles that create this starting position.

We have also explored how AePS ecosystem can be strengthened through targeted reforms: incentivize agents, enhance system reliability, broaden access through interoperability, combat fraud, and foster digital upskilling.

More importantly, we demonstrated how AePS is not the finish line for underserved users; it is a vital launchpad toward broader engagement with UPI and other digital services. Through trusted guidance, seamless product design, incentives, and trusted security, users can make the transition from assisted cash-in withdrawals to independent, confident digital transactions.

The future financial inclusion landscape depends on how to overcome the remaining frictions in the AePS journey, how to expand agent networks, how to build trust through transparency and protection, and personalized support to meet diverse needs. Success will mean underserved segments will no longer face barriers to inclusion, but instead enjoy real, sustained access to digital financial empowerment that drives development and well-being across India’s regions. This whitepaper invites stakeholders to join this transformative vision.

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