



# CLOSING THE GAP WITH OFFLINE- CAPABLE PAYMENTS

Tackling Connectivity Gaps,  
Cash Dependency, and Financial  
Exclusion in the Philippines

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# Executive Summary

Despite digital payments covering over 90% of retail transactions in the Philippines (BSP, 2024), millions in rural and coastal areas remain excluded due to poor connectivity and reliance on cash. This limits financial access for MSMEs, farmers, fishers, and remittance-dependent families.

Offline-capable wallets address this gap by enabling secure offline transactions that sync once connectivity is restored, preventing double-spending and ensuring interoperability with national payment systems. Offline-capable payment systems directly advance financial inclusion by addressing barriers of cost, distance, and weak infrastructure that keep rural households unbanked (GMA News, 2021). They ensure service continuity in disaster-prone areas where connectivity fails, strengthening resilience and recovery (Federal Reserve, 2024). For MSMEs, which employ over 60% of Filipinos, offline tools stabilize cash flow, enable secure transactions without internet, and unlock access to credit. Finally, by digitizing last-mile payments, including government transfers and remittances, these systems could reduce leakages, fraud, and delays, building trust in financial institutions and government programs.

Aligned with BSP's financial inclusion strategies, offline payments present a systemic opportunity to extend digital finance, accelerate inclusive growth, and ensure no community is left behind.

## Introduction



The Philippines faces a paradox in financial services: rapid digital adoption in cities alongside persistent exclusion in rural and remote areas. Nearly half of adults remain unbanked, with 464 municipalities lacking a single bank presence as of mid-2025, most in Visayas and Mindanao. Poor connectivity and limited infrastructure keep many communities dependent on cash, despite efforts like LANDBANK's PhilSys program that onboarded millions of new account holders.

This exclusion carries wide economic costs. MSMEs, which make up 99.5% of businesses, struggle with cash-based operations that limit credit and growth. Agriculture and fisheries face inefficiencies from delayed payments, while families reliant on USD 34–36 billion in annual remittances still endure costly, cash-heavy channels. These challenges deepen inequality and constrain national development.

Offline-capable, Layer-2 payment solutions can bridge these gaps by enabling secure transactions without continuous internet, then synchronizing once online. The significance is broad: for policymakers, reduced leakages and improved efficiency in government disbursements; for financial institutions, access to untapped markets; for MSMEs and farmers, better liquidity and access to formal finance; for households, secure remittances even offline. At a national scale, offline-capable payments reduce cash dependency, strengthen transparency, and support inclusive, resilient growth.

# 1.1 Problem Statement

Despite rapid digital adoption, large segments of the Philippine population remain excluded from reliable financial services. Four barriers stand out:

**Financial Exclusion:** Nearly half of adults remain unbanked, with access to accounts and credit concentrated in urban areas (BSP, 2023).

**Connectivity Gaps:** Rural and island communities, particularly in Mindanao and the Visayas, lack consistent internet access, limiting the reach of existing e-wallets and mobile banking.

**Cash Dependency:** MSMEs, farmers, and fishers still rely on cash, hindered by settlement delays, poor internet, and low device access. Offline-capable wallets on basic or shared devices provide a practical solution.

**Remittance Vulnerability:** While remittances exceed USD 36 billion annually (World Bank, 2023), many families in low-connectivity areas face delayed or restricted access to funds.



# 1.2 Competitor Analysis

Competitor	Strengths	Weaknesses	Offline suitability
E-wallets	Require mobile data/online connectivity for most flows	Require mobile data/online connectivity for most flows	Low
Digital banks	Low-cost accounts, KYC scalability, deposit base, digital onboarding	Branchless model needs connectivity	Low
Traditional banks	Deep settlement rails, cash conversion points	Cash intensive, slow, costly (OTC fees); agents dependent on physical cash logistics	High, fully regulated, but manual processes hinder traceability

# Market Profile

## 2.1 Demographics

The Philippines is a young, rapidly urbanizing nation, yet nearly half its people still live in rural areas (United Nations Population Fund, 2019). Metro Manila and CALABARZON drive digital adoption, while Visayas and Mindanao remain more cash-dependent due to weaker infrastructure and agriculture-led economies. According to the Philippine

Statistics Authority, there are about 1.2 million registered enterprises, 99.63% of which are MSMEs. Microenterprises dominate with roughly 1.1 million establishments, while 109,000 are classified as small and 4,000 as medium enterprises (PSA, 2023).

# 116.8 M

total population



Median age:

# 25-26

## Enterprise Breakdown in the Philippines



This highlights that **Philippine commerce is reliant on MSMEs** operating in highly transactional, cash-dependent environments where reliable, inclusive payment systems can significantly enhance business continuity and financial inclusion.

## 2.2 Connectivity

### A. Smart Phone Connections

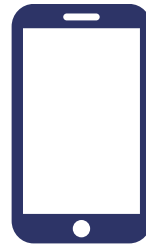
As of early 2025, the Philippines had widespread mobile connectivity, with penetration exceeding the total population due to multiple SIM use (Kemp, 2025). Despite this high level of connectivity, **not all have access to mobile internet; some are limited to basic services like voice and SMS**. This shows that while most of the population has access to the internet via smartphones, coverage gaps and fluctuating service quality occurs, especially in rural and agricultural regions. **PSA's 2024 survey confirms that smartphones are the most common ICT device nationwide**, with nearly 91% ownership in Metro Manila among individuals aged 10 and above (PSA, 2024).



While a full rural/urban breakdown has not yet been publicly released, international evidence from the GSMA State of Mobile Internet Connectivity Report 2024 shows that rural smartphone ownership rates typically lag urban areas by 10–30 percentage points in comparable economies (GSMA, 2024). Given that about half of Filipinos live in rural areas, this still translates into **tens of millions of rural residents who own smartphones but face intermittent connectivity**. These limitations highlight the need for payment solutions that work even with limited or offline connectivity.

**142M** active mobile connections

Coverage gaps & unstable service remain in rural areas



Internet users	83.80%
Voice/SMS only	16.20%

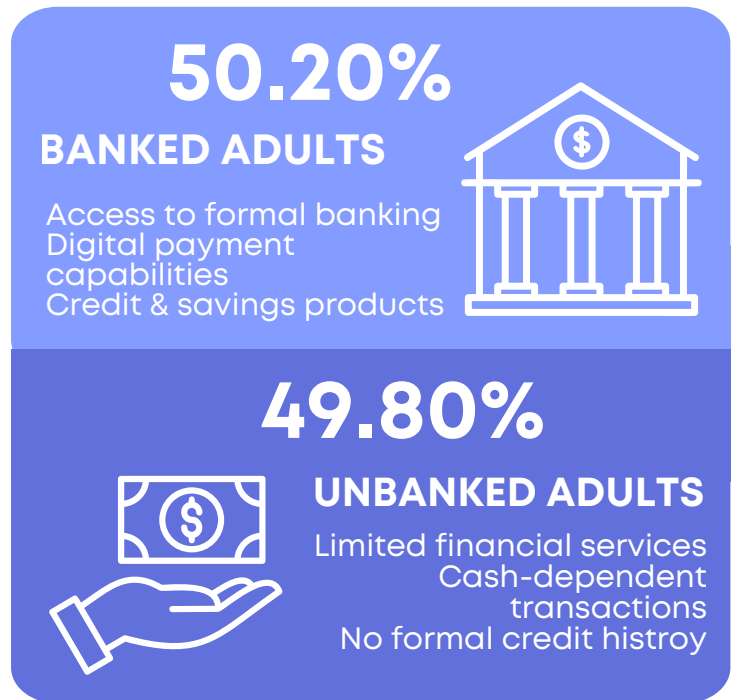
## B. Internet Connection Speed

Rank	Region	Speed (Mbps)	vs Metro Manila	Rating
1	Metro Manila	63.33	-	Excellent
2	Central Visayas	37.00	-42%	Good
3	Davao Region	34.00	-45%	Average
Lowest	ARMM	16.20	-75%	Poor

As seen from the table, Metro Manila had the fastest median mobile download speed, followed by Central Visayas, Davao, and Autonomous Region in Muslim Mindanao reported the slowest. Note that the internet speed in Metro Manila is about 71% faster than in Central Visayas (Ookla, 2025). This wide gap between urban and rural connectivity highlights how uneven digital infrastructure is across the country. **For businesses and consumers outside major urban centers, unstable or slow mobile internet limits their ability to reliably conduct digital transactions.** These conditions emphasize the importance of payment systems that can operate offline or with intermittent connectivity, ensuring inclusivity in regions where connectivity remains a barrier.

## 2.3 Banked VS Unbanked

Financial account ownership in the Philippines has expanded in recent years but remains uneven. As of Q4 2023, **50.2% of adults held a formal financial account**, up from 34% in 2017 (BSP, 2023). At the household level, ownership rose to 65% in 2023, compared with 56% in 2021 and just 29% in 2019. These gains reflect targeted inclusion measures such as **PhilSys-LANDBANK integration**, which onboarded **8.4 million unbanked individuals in 2022**, and the growth of Basic Deposit Accounts (BDAs), now totaling 23.6 million accounts with ₱35.6 billion in deposits, a 624% year-on-year value increase.



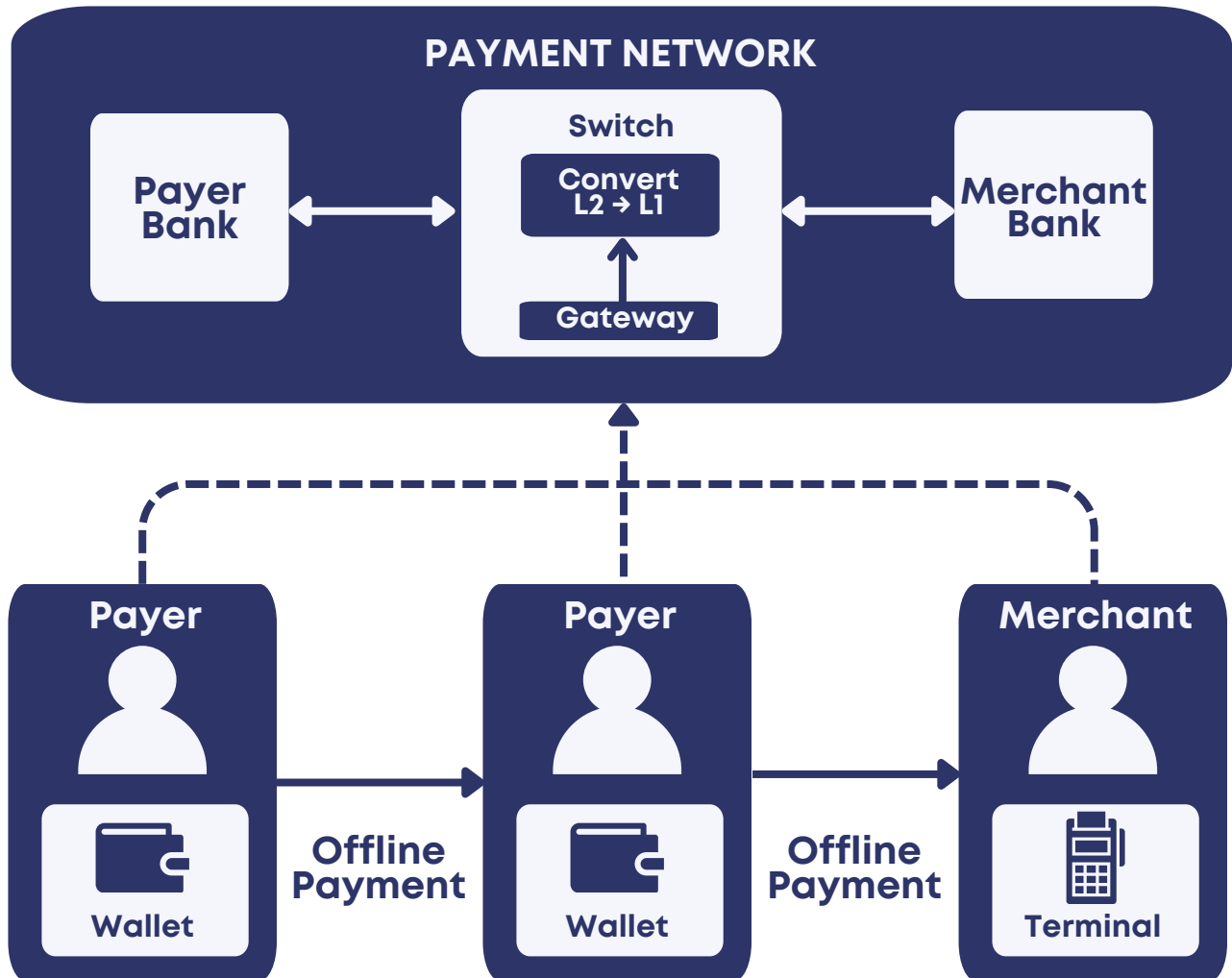
Digital banking is also accelerating access: by end-2023, the country's **6 licensed digital banks had onboarded 5.85 million depositors**, growing 27% quarter-on-quarter (BSP, 2023). These digital-first, low-cost offerings have proven effective in reducing traditional onboarding barriers. Yet nearly half of Filipino adults remain unbanked, constrained by structural barriers:

- **Affordability** – minimum balance and transaction costs remain prohibitive.
- **Identification gaps** – despite PhilSys expansion, many still lack valid IDs.
- **Geographic access** – some regions report up to 70% of municipalities without a bank branch.
- **Trust and literacy issues** – reliance on cash persists due to fear of fraud and limited awareness of account benefits.

The data underscores a persistent divide: while progress is evident, **systemic gaps in affordability, access, and trust continue to exclude millions from the formal financial system.**

# Solution Design

## 3.1 Offline Payment Infrastructure



The diagram illustrates how offline digital payments operate within a payment network. It shows how a payer can make offline payments using a wallet to another payer or a merchant, whose terminal receives the payment. These offline transactions are later synchronized with the broader payment network, comprising payer and merchant banks through a gateway that converts offline (Layer 2) transactions into online (Layer 1) settlements once connectivity is restored. Offline terminals serve as the receiving endpoints within the payment infrastructure managed by payment networks. They function as universal receivers for offline transactions, allowing merchants and payees across the ecosystem to authenticate and process payments smoothly.

## 3.2 Trade Data

### A. Agriculture and Fishery

Agriculture and fisheries remain vital to rural livelihoods, employing about a fourth of the labor force and contributing 9% of GDP (PSA, 2024). Both sectors face structural inefficiencies, including low growth and high post-harvest losses (Orzales, 2025; Tadifa et al., 2022).

#### Post-harvest Losses



**40%**

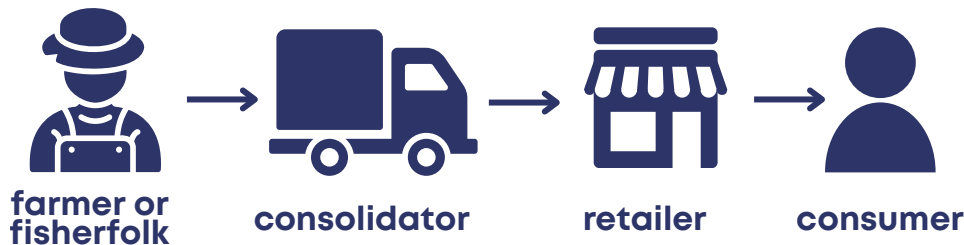
losses in agriculture



**3-38%**

losses in fishery

#### Trade Process



Trade in these sectors often follows long, fragmented value chains, where small farmers and fishers sell to consolidators or wholesalers, who then supply retailers and wet markets. Transactions are frequently informal and rely on cash or credit-based arrangements, where payments are delayed or settled on trust (Asian Development Bank, 2021). Payment delays and inefficiencies contribute to billions in lost value across agricultural regions each year (Department of Agriculture, 2022).

#### Payment Inefficiencies

##### Delayed Reinvestment Capacity

Delayed payments restrict purchase of seeds, fertilizers and equipment

##### 3-7 Payment Delays

Transactions settled on trust with extended payment terms reducing cash flow predictability

##### Cash/Credit

Heavy reliance on physical cash and trust-based credit arrangements

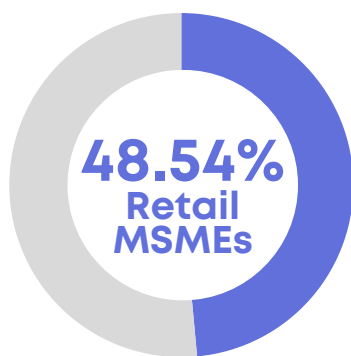
#### Annual Economic Impact

**PHP 20-30B**

Lost value across major agricultural regions due to payment delays

While the government has pursued modernization projects such as farm-to-market roads and seaport upgrades (Insider PH, 2024), these focus on physical infrastructure and overlook financial innovation. **Integrating offline-capable digital payment systems into agricultural and fishery trade flows can address settlement delays, stabilize cash flow, and enable faster reinvestment.** While the cost of owning a smartphone remains a barrier, adoption can be supported through cooperative-shared devices, bundled microfinancing for affordable handsets, or subsidy programs linked to government modernization efforts. **By digitizing point-of-trade settlements even in low-connectivity areas, farmers and fisherfolks can reduce reliance on middlemen,** capture more value directly from buyers, and lessen income volatility. Over time, these efficiencies outweigh initial device costs and build a more inclusive rural economy. This solution would help capture more value along fragmented supply chains, limit losses from delayed payments, and build a more inclusive rural economy.

## B. Retail



Annual Financial Impact on Retail MSMEs

**PHP 15-20B**

Annual losses to small retailers from payment delays

### Cause

Unreliable digital payment infrastructure

### Effects

**5-8% Monthly Revenue Impact**

Percentage of monthly revenue lost due to payment inefficiencies and delayed settlements

**4-6 Average Day Delay**

Typical payment delay period constraining working capital and forcing short-term borrowing

Retail trade is a critical driver of the Philippine economy, accounting for nearly half of all MSMEs and serving as a backbone for local commerce and consumer access to goods (PSA, 2023). **As the largest contributor to employment and business activity among MSMEs, its stability directly affects both rural and urban communities.** Improving the digital payment system will specifically benefit MSMEs since retail and wholesale trade remains the top business segment (PSA, 2023). Retail MSMEs in the Philippines often rely on timely payments from buyers to cover essential expenses such as payroll, raw materials, and operational costs.

Delays in settlement can disrupt cash flow, forcing small suppliers with limited reserves to take out loans or reduce operations, and potentially damaging trust with clients (Simua, 2024). In rural areas, where trade is more informal, these **payment delays are exacerbated by unreliable or slow digital payment infrastructure**, including limited internet connectivity and low adoption of e-wallets. Such inefficiencies increase the risk of income volatility and operational losses, highlighting the need for offline-capable digital payment systems that can reduce delays and improve liquidity (NEDA, 2019).

## C. Micro, Small, and Medium Enterprises on Digital Payment Systems

MSMEs dominate the Philippine economy, representing **99.63% of registered businesses** and **employing over 60% of the workforce** (PSA, DTI, 2024). The BSP's 2023 Report on E-Payments Measurement shows that digital transactions accounted for 90.3% of total e-payments, equivalent to 2.37 billion transactions in that year. As seen from Figure 3.2.1 Share of Digital Payments by Value in 2023, digital payment transactions have a steady increase in the Philippines. This **demonstrates a strong national shift toward digitalization**. The surge in digital payments over the past years was driven by the adoption of online merchant transactions, person-to-person remittances and supplier payments made by businesses in the country (Bangko Sentral ng Pilipinas, 2023).

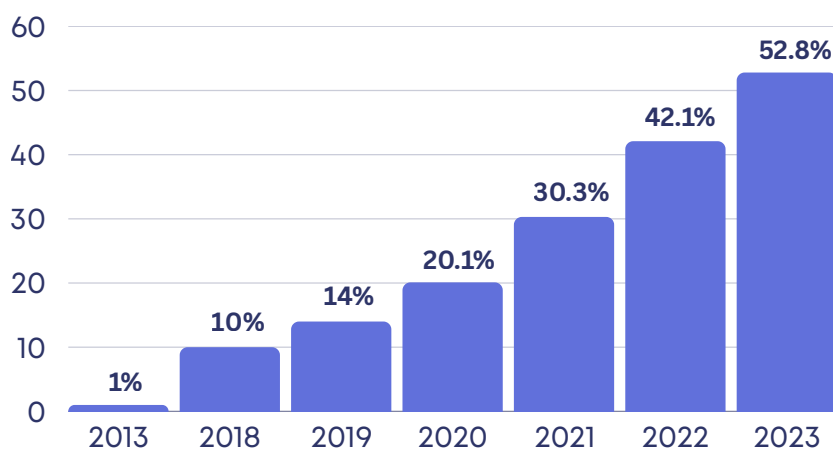


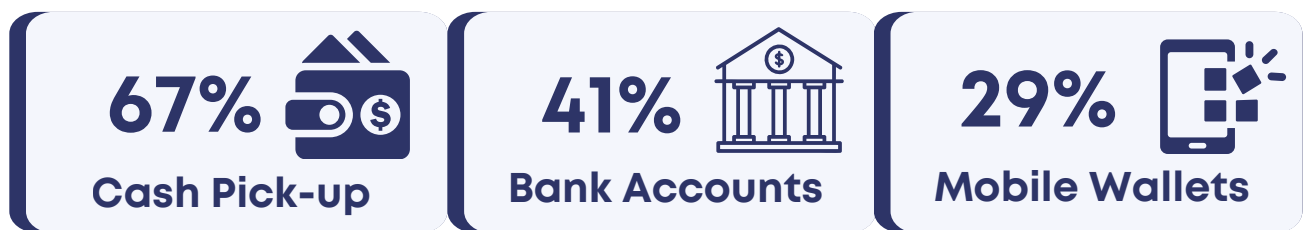
Figure 3.2.1 Share of Digital Payments by Value in 2023

Moreover, The Bangko Sentral has welcomed transformative technologies over the years under the “test-and-learn” approach. The **BSP implements a regulatory sandbox for financial institutions to promote innovative and new financial solutions** and products addressing market gaps and opportunities to develop an inclusive digital financial ecosystem. With this, **more advancements on digital payment systems will occur and be more available to MSMEs**. Offline payment systems can strengthen rural liquidity and reduce dependency on cash-based trade. This positions Layer-2 adoption not merely as a technological upgrade, but as a high-impact economic intervention for critical sectors.

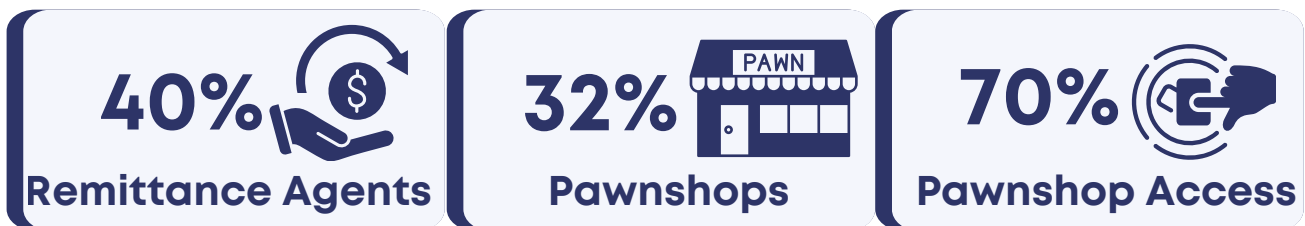
## 3.3 Remittance

The Philippines remains one of the world's largest recipients of remittances, with inflows reaching **USD 36.1 billion in 2022** (World Bank, 2023) and **USD 34.49 billion in 2024 through banks** (Bangko Sentral ng Pilipinas, 2024). These flows contribute around **8–9% of GDP** (Gulf News, 2024) and support more than **18 million Filipinos** (PIDS, 2024). Despite their scale, access to remittances is still uneven, especially in rural and peri-urban areas such as Mindanao and the Visayas, where families often lack direct access to banks or digital wallets and are forced to depend on pawnshops, remittance agents, and other cash pick-up centers.

### Remittance Access Channel Distribution



### Alternative Service Provider Dependency



Data shows that **many remittance receivers still rely on cash pick-ups as their main channel**, while others use bank accounts or mobile wallets (UniTeller, 2019). The National Baseline Survey on Financial Inclusion also found that a substantial number of remittance receivers use remittance agents, while others depend on pawnshops (BSP, 2019). Access is highly uneven across regions: Metro Manila has about 3.6 bank branches per 10,000 adults, but in BARMM this drops to just 1 per 100,000 adults (PIDS, 2020). Moreover, a large proportion of adults identify pawnshops as the nearest and most accessible financial service provider (PIDS, 2020).

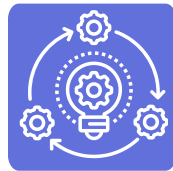
This overreliance on cash distribution introduces several inefficiencies. These include the time and cost burdens of traveling long distances, delays in fund availability, heightened risks from carrying large sums of cash, and limited digital conversion of remittances into the formal financial system, which restricts opportunities for savings, investment, and credit scoring.

## 3.4 Limitations and Weaknesses

While offline-capable Layer-2 payment systems present a transformative solution for financial inclusion in the Philippines, several limitations and risks must be carefully managed for successful adoption:



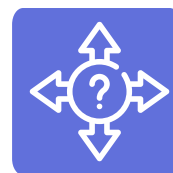
Adoption Barriers



Interoperability



Security Risks



Regulatory Uncertainty

- **Adoption Barriers-** Limited digital literacy and hardware costs may hinder uptake among rural merchants, farmers, and fisherfolk without targeted support through financing, subsidies, or partnerships. A common concern is smartphone access and the preference for cash.
- **Interoperability-** Despite progress through QR Ph and PhilPaSSplus, seamless offline integration across banks, wallets, and remittance networks remains technically complex and risks fragmentation.
- **Security Risks-** Offline settlement introduces risks of double spending, delayed reconciliation, or fraud. Strong encryption, synchronization, and consumer protections are essential to build trust.
- **Regulatory Uncertainty-** BSP's supportive test-and-learn framework may still restrict offline transactions to low-value transfers initially, while AML/CFT compliance requirements could slow broader adoption.

## Assumption

This market research is based on several key assumptions regarding the trajectory of digital finance in the Philippines:



Sustained Digital Growth



MSME Dominance



Sectoral Needs in Retail, Agriculture and Fisheries



Regulatory Support

- **Sustained Digital Growth-** With mobile penetration at 122% and internet penetration at 83.8% (Kemp, 2025), foundational infrastructure for digital payments is strong, though rural connectivity gaps remain a challenge.
- **MSME Dominance-** MSMEs comprise 99.63% of all registered businesses and will remain the backbone of Philippine commerce and employment. Their dependence on timely and cost-efficient payment systems positions them as the most likely early adopters.
- **Sectoral Needs in Retail, Agriculture and Fisheries-** Faster, more reliable digital settlement mechanisms are assumed to reduce inefficiencies, improve liquidity, and stabilize cash flow in these highly fragmented sectors.
- **Regulatory Support-** The BSP is expected to maintain a progressive stance through sandbox and test-and-learn frameworks, creating a favorable environment for pilot and scale-up initiatives.

# Validation

## 5.1 Market Readiness

The feasibility of offline-capable payment systems in the Philippines is reinforced by both market readiness and the ability of such systems to directly resolve the country's financial inclusion challenges.



High Device Penetration



Proven Digital Adoption



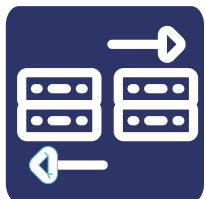
Policy Alignment



Stakeholder Demand

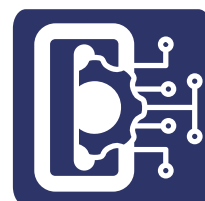
- **High Device Penetration-** With 142 million mobile connections and 97.5 million internet users, devices are already in place; the barrier is connectivity.
- **Proven Digital Adoption-** BSP's 2023 E-Payments Measurement Report shows digital payments now account for 90.3% of transactions, reflecting strong consumer and merchant willingness.
- **Policy Alignment-** BSP's Digital Payments Transformation Roadmap and Financial Inclusion Strategy prioritize resilience, interoperability, and account ownership; objectives offline-capable systems are designed to advance.
- **Stakeholder Demand-** MSMEs, fintechs, and remittance providers face persistent pain points around cash dependency and settlement delays, making them natural early adopters.

## 5.2 Proposed Solutions



**Government Transfers-** Digitizing cash-based programs such as 4Ps, subsidies, and emergency relief into offline wallets ensures beneficiaries can access funds immediately, spend at local merchants, or cash out at agents, reducing wait times, travel costs, and administrative overhead. Evidence shows digital G2P lowers leakage, speeds distribution, and can yield annual savings in the hundreds of millions of pesos.

**MSME and Merchant Adoption-** Low-cost acceptance tools, mobile apps, NFC enabled devices and shared cooperative models empower small merchants and micro-enterprises to transact digitally even without connectivity. This improves cash flow, reduces reliance on informal credit, and strengthens their role as local economic anchors.



**Retail, Agriculture and Fisheries-** Integrating offline payments into farm-to-market transactions enables immediate point-of-trade settlements for retailers, farmers, fishers, and consolidators. Paired with working-capital programs, this reduces post-harvest losses, accelerates reinvestment, and stabilizes supply chains. Financing low-cost devices and shared access models further lower adoption barriers, creating strong incentives to move away from cash.

**Remittances-** Offline Layer-2 wallets allow funds to reach households instantly, even in low-connectivity areas, reducing travel and cash-handling costs while improving consumption smoothing. With remittances contributing roughly 8–9% of GDP, faster access has significant economic impact.



**Impact at Scale-** Targeted pilots in high-need provinces, combined with public-private partnerships and regulatory alignment, can demonstrate measurable fiscal savings, operational efficiency, and social benefits. Offline Layer-2 systems strengthen financial inclusion, improve transparency, reduce dependency on cash, and empower MSMEs and households alike.

## 5.3 Social Impact



**Improved Financial Inclusion in Rural Areas-** Research on poor households in the Philippines shows that many remain unbanked or rely on informal financial services largely because formal banking is inaccessible due to cost, distance, and weak infrastructure (Llanto, 2015). These challenges are particularly evident for farmers, fisherfolk, and small vendors in rural and disaster-prone areas, who often face long and costly trips to the nearest bank branch just to deposit earnings, make payments, or access credit. Offline banking directly addresses these barriers by reducing geographic and financial obstacles, lowering travel costs, and saving time. In doing so, it supports the daily operations and livelihoods of these vulnerable groups. The Bangko Sentral ng Pilipinas (BSP) has emphasized that offline digital payment solutions will play a critical role in boosting financial inclusion in off-grid areas (GMA News, 2021). Therefore, expanding offline banking systems can create a more inclusive financial ecosystem that reaches underserved communities.

**Reliability During Disruptions-** Offline banking is particularly important for communities in disaster-prone areas such as many in the Philippines where connectivity often fails. By enabling continuous access to essential financial services during emergencies and outages, offline systems strengthen both household resilience and broader economic recovery. The U.S. Federal Reserve has similarly noted that offline or hybrid payment models can mitigate risks associated with internet outages, enhancing the reliability and resiliency of digital payment ecosystems (Federal Reserve, 2024).



**Empowering MSMEs as Growth Multipliers-** MSMEs, which employ over 60% of the workforce, rely heavily on liquidity and predictable cash flow. Offline Layer-2 acceptance tools allow these enterprises to conduct transactions securely and immediately, regardless of connectivity. This reduces income volatility, unlocks access to formal credit, and strengthens their role as anchors of local economic ecosystems.

**Enhancing Transparency and Trust-** By digitizing transactions at the last mile, these systems introduce greater accountability in critical flows, government-to-person transfers, remittances, and local trade. This reduces leakages and fraud, helping funds reach their intended recipients more efficiently. For citizens, increased transparency translates into greater trust in both financial institutions and government programs.



# Conclusion

The Philippines is at a crossroads in its journey toward a fully inclusive digital economy. While urban adoption of digital payments has surged, rural and vulnerable communities remain constrained by connectivity gaps, cash dependency, and limited access to formal financial services. Offline-capable Layer-2 payment systems present a transformative solution, enabling secure, consecutive transactions without constant internet access, and synchronizing seamlessly once connectivity is restored.

The potential impact is profound. Digitizing government transfers can unlock hundreds of millions in savings, reduce administrative inefficiencies, and speed relief to beneficiaries. Empowering MSMEs with offline payments strengthens local commerce, improves liquidity, and reduces reliance on informal credit. In agriculture and fisheries, immediate point-of-trade settlements cut post-harvest losses and accelerate reinvestment, while remittance-dependent households gain timely, reliable access to critical funds.

Beyond these sectoral benefits, offline-capable Layer-2 payments drive systemic change: enhancing transparency, building trust, and leveling the economic playing field between urban and rural communities. With carefully designed pilots, supportive regulation, and public-private collaboration, this approach can turn inclusion from aspiration into reality.

Ultimately, adopting offline Layer-2 payments is more than a technological upgrade, it is a strategic lever for national growth, resilience, and equity, ensuring that no Filipino is left behind in the country's digital future.



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