

UnionBank's Project i2i

A payment network driving financial inclusion in the Philippines through cheaper and more efficient domestic transactions.

UNIONBANK **UB**[>]





"35M Filipinos live on less than \$2 a day, and 35 million adult Filipinos are unbanked. This is clearly a huge opportunity for financial inclusion, a chance to make a difference in a very meaningful way."

JUSTO ABOITIZ ORTIZ

CHAIRMAN OF
UNIONBANK OF THE
PHILIPPINES

ABOUT PROJECT I2I

The Philippines is a rapidly emerging economy with a population of over 100 million. However, one third of its population lives on less than \$2 a day and remains unbanked. This means that 35 million Filipinos have severely limited access to both the domestic and global financial ecosystems. This is a significant problem when up to 10% of the Philippines' GDP is made up of international remittances sent from overseas workers to family members across the country.

UnionBank of the Philippines, one of the largest banking institutions in the country, sought to tackle this challenge by partnering with Kaleido, Amazon AWS, Microsoft Azure, and seven rural Philippine banks to create an inter-rural bank payment platform using Enterprise Ethereum.



THE CHALLENGE

A staggering 35% of Filipinos remain unbanked. As such, UnionBank of the Philippines aimed to facilitate their financial inclusion with Project i2i. Because 56% of Filipinos reside in rural communities with scarce access to financial services, Unionbank sought to partner with the 476 rural banks already invested in these areas and established in their relationships with the community - But how can UnionBank work with these rural banks to financially include unbanked Filipinos when the rural banks themselves are disconnected from electronic banking services and domestic money transfer networks?

THE SOLUTION

In a pilot-project partnership with seven rural banks, UnionBank built a decentralized, cost-efficient, approximately real-time inter-rural bank payment platform to connect rural banks to each other and to national commercial banks, using Enterprise Ethereum running on Kaleido. This effectively brings these rural banks into the domestic financial system and increases inclusion access to the communities in which they operate.

GOALS ACHIEVED

The i2i platform launched in April of 2019 with 35 rural bank partners with 150 branches and 250,000 accounts nationwide, aiming to service millions of previously unbanked Filipinos. In August 2019 alone, transaction volume on i2i was at over USD 1 million with 335 transactions performed that month. Project i2i received clearance and support from the central bank of the Philippines (Bangko Sentral ng Pilipinas) to operate as the country's first blockchain-based payment network for domestic remittances.

THE PROBLEM OF FINANCIAL INCLUSION

Without access to financial services, individual consumers and business owners in rural areas of the Philippines are unable to make use of regulated bank accounts, speedy domestic and international payment networks, lucrative investment mechanisms, trustworthy credit options, and more. With financial inclusion, these Filipinos become empowered to better manage their assets and to better contribute to the national economy. UnionBank saw the potential of Project i2i not only to help alleviate poverty in the Philippines, but also to make a real difference in the quality of people's lives.

The challenge of facilitating financial inclusion was to encourage the financially excluded, traditionally located in rural areas, to begin and to continue to engage with financial systems. The key to this engagement was determined to be a partnership with the existing 492 rural banks located amid small rural communities across the country. The rural banks are a critical piece of infrastructure within these communities, already embedded and invested in their well-being and development. Their function and established presence within these remote village communities makes them uniquely positioned to reach a large proportion of the 56% of Filipinos who live in these areas.

The problem of partnering with these rural banks was that they in themselves were unbanked, in that they were disconnected from each other, from national commercial banks, and from domestic payment networks. The goal of Project i2i thus became to overcome the challenges of connectivity and lack of basic technological resources across rural areas, and to build the infrastructure that would effectively bring the rural banks into the domestic financial system, together with the customers they serve.



THE BLOCKCHAIN SOLUTION

UnionBank developed an Enterprise Ethereum-based inter-bank platform running on Kaleido to enable secure, instantaneous and cost-efficient domestic remittances, effectively allowing rural banks to easily send and receive money across any bank account in the Philippines.

The Philippines' 500+ rural banks play a critical role in the countryside which commercial banks have limited presence in. They service farmers, fisherfolk, and local businesses bringing progress to communities. However, due cost and other barriers, rural banks are excluded from national automated clearing houses (ACHs) and international payment networks such as SWIFT.

i2i closes this gap as rural banks can affordably leverage its network to connect to local ACHs, commercial banks and other rural banks, to perform real-time transactions powered by blockchain technology and UnionBank's very own PHX stablecoin added to the platform in July 2019.

The Project i2i platform consists of a web API and an Ethereum blockchain back-end. The API allows a bank's API and/or core banking system to connect to the blockchain back-end. The connection handles key management and allows participants to construct and send signed transactions to the smart contract running on a permissioned Quorum blockchain deployed through Kaleido's enterprise blockchain platform.

Signed transactions instructed through the API trigger three key functions of the smart contract:

1. The pledge of digital tokens corresponding to Philippine Pesos held in an off-chain bank account
2. The redemption of the digital tokens
3. The transfer of tokens among platform users

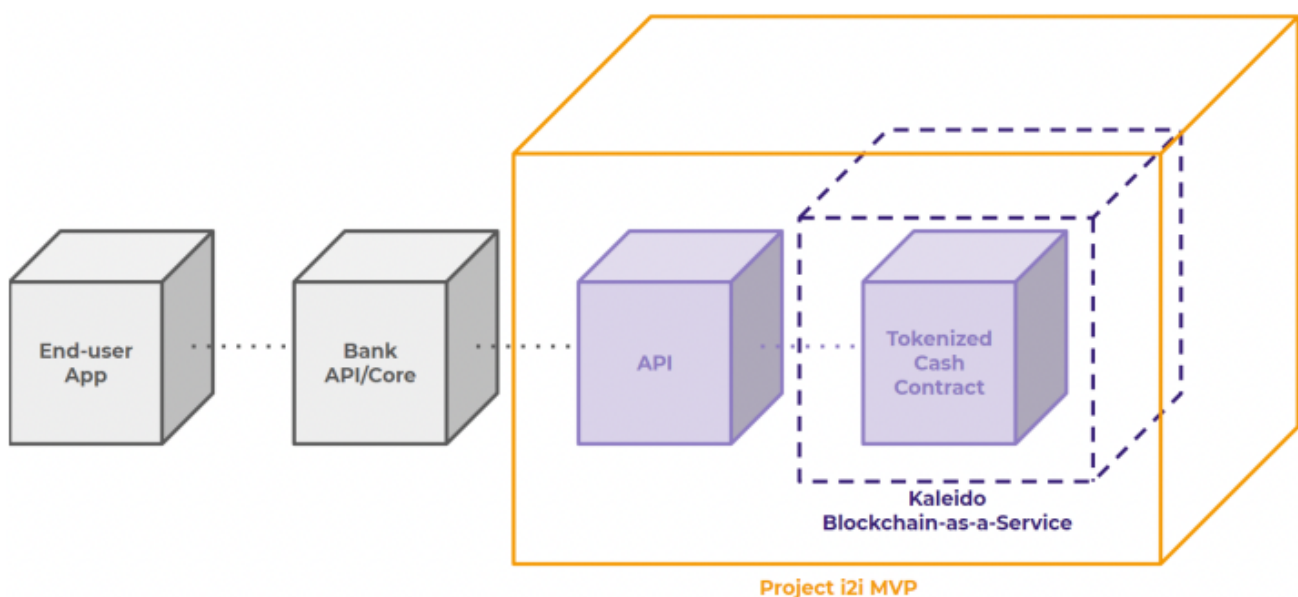


Diagram 1: Overview of Project i2i's MVP architecture

In this way, digital tokens are used to instruct and settle remittances between participating rural banks by consolidation through one platform's messaging, execution, settlement, and accounting of the transaction.

From the customers' perspective, field research showed that rural communities valued the social interactions of banking activities.

The resulting solution offered the following financial operations benefits:

- Creation of a verified chronological digital ledger of remittances that enables immediate visibility of cash inflows and outflows across each partner bank
- Streamline of banking operations - eliminating at least 20 intermediation steps required to complete a domestic transaction - into one seamless process
- Faster transaction times and lower costs
- Easy operability even in low-tech settings and intuitive user interface
- Automated real-time reporting
- Automated notification of relevant stakeholders for cash settlement operations
- Real-time liquidity management
- Automated compliance

The Project i2i solution was thus designed to integrate with rather than to disrupt this “high-touch” customer experience.

UnionBank took lead to develop a customized highly-intuitive user interface that would encourage rural bank staff to adopt the technology and incorporate use of the platform through customer-facing interactions.

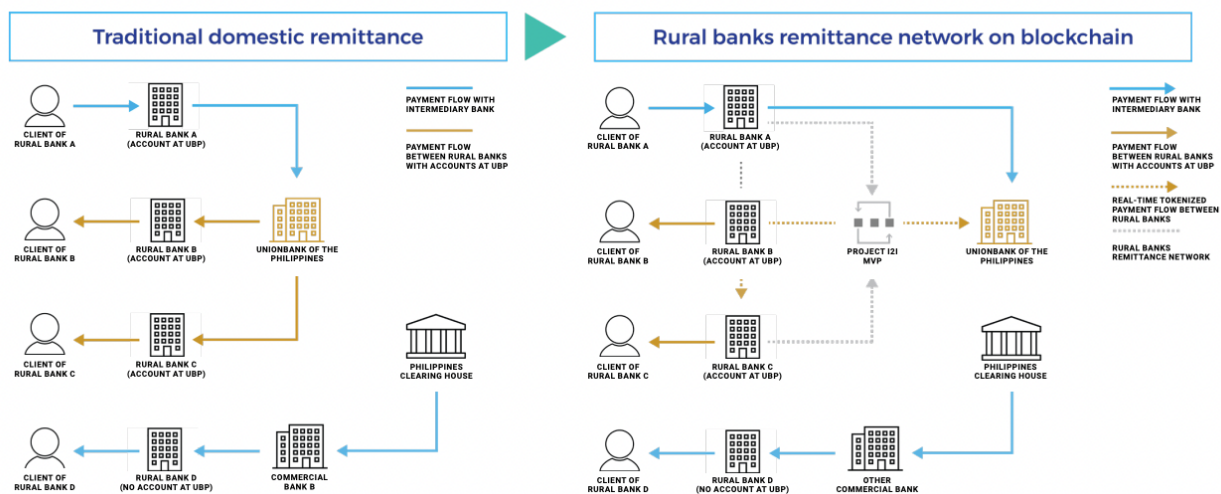


Diagram 2: Streamlined financial processes

The i2i platform effectively simplifies banking operations by removing several manual steps in the transaction and reconciliation process. Inter-rural bank transactions may now occur with near-real time efficiency for customers.



EVOLUTION OF PROJECT I2I

In its current state, Project i2i is at phase one of an evolutionary approach toward the use of crypto cash on public Ethereum.

PHASE ONE: CLOSED-LOOP BANK CRYPTO-CASH

Crypto cash issued by a commercial bank for payment among clients.

Objectives

- Introduce cash tokenization.
- Achieve operational and cost-efficiency in bank to client and client to client transactions.

PHASE TWO: INTERBANK SETTLEMENT UTILITY

Decentralized utility for interbank payments and settlement.

Objectives

- Extend tokenized cash to commercial bank transactions.
- Validate viability and scalability for commercial banks and other financial institutions.

PHASE THREE: CENTRAL BANK ISSUES CRYPTO-PRESTO

General purpose crypto-cash issued by central bank.

Objective

- Make tokenized cash available for crypto-finance cases.

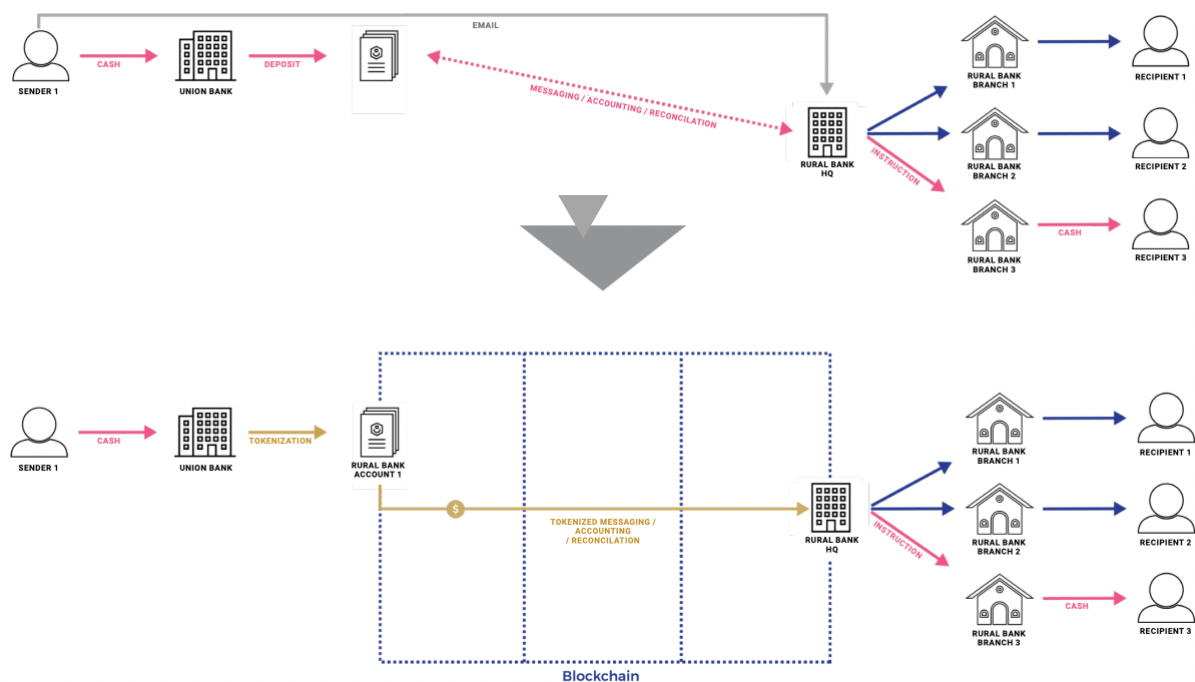


Diagram 3: Improved customer experience

In summary, the Project i2i platform facilitates financial transactions in remote areas of the Philippines by providing rural banks with the infrastructure to access the domestic financial system. It encourages rural bankers to adopt new technologies with its extremely intuitive user interface. It empowers rural banks to improve customer experience while maintaining their traditional high touch service. Finally, it enables millions more Filipinos to enjoy the benefits of financial inclusion.

SUSTAINABLE RESULTS AND POSSIBILITIES FOR A RAPIDLY EMERGING ECONOMY

After a successful 6 month pilot period, Project i2i launched in April 2019 with clearance and support from the Central Bank of the Philippines (Bangko Sentral ng Pilipinas, BSP) to operate as the the country's first blockchain-based payment network for domestic remittances.

UnionBank aims to onboard many of the Philippines' 500+ rural banks onto the platform. Thus far, the BSP has shown strong appreciation for Project i2i's use of blockchain to drive financial inclusion at the institutional level. The BSP recognizes the increased accessibility, number of transactions, and enhanced visibility for regulators the platform brings, among other benefits. The BSP is encouraging the commercial launch of the i2i platform, and is helping to drive adoption by mandating rural banks to open their infrastructures to enable integration.

The success of the i2i pilot led to further adoption of blockchain technology, specifically Enterprise Ethereum, in the financial sector of the Philippines. UnionBank also piloted near real-time cross-border transfers using tokenized fiat from OCBC Bank in Singapore to an i2i rural bank. This is a game-changing service for families of millions of overseas Filipino workers as it reduces the cost of sending money back home and increases access to bank-grade remittances.

For the Philippines, a country where overseas remittances make up to 10% of GDP, an Ethereum-based international payment network would make incredibly significant strides in increasing accessibility and efficiency, while also decreasing costs of cross-border remittances for millions of Filipinos.

The connectivity achieved by Project i2i is a foundation for many more value services that can be built onto its newly established networks. Based on these developments, the domestic remittance platform will be but the first step in the adoption of new blockchain-based products that will be accessible to a much wider percentage of the Philippine population.

In working toward financial inclusion, the i2i platform is helping to foster national economic progress and catalyze inclusive prosperity in the Philippines. This triumph is already encouraging many other industries to consider the revolutionary impact of enterprise blockchain technology.



TECHNICAL MILESTONES

The establishment of Project i2i has not only resulted in the tremendous social impact of financial inclusion in the Philippines; it has also produced significant milestones for enterprise blockchain development.

- Successful integration of the Kaleido private chain with the i2i platform.
- Management of concurrent requests for a single Ethereum account across a pool of API servers.
- Implementation of a testing framework to experiment with Ethereum transaction lifecycle events.
- Abstraction of smart contracts from application code through Kaleido's smart contract management Services.
- Transaction signatures utilizing the Microsoft Azure Key Vault.
- Optimization of transaction throughput of a single account from 25 to 250 transactions per minute.
- Integration of smart contracts tests into a continuous integration pipeline.
- Establishment of a fully dockerized environment including a test chain.
- Use of Google's distroless docker container to reduce attack surface of API servers.
- Use of Kaleido's Kubernetes capabilities to store sensitive application configuration data.

TECHNOLOGY PARTNERSHIPS

Microsoft Azure

Microsoft Azure is an open, flexible, enterprise-grade cloud computing platform. For Project i2i, Microsoft Azure facilitated UnionBank's blockchain trials and provided private key management services through customization of the Azure Key Vault. This technology enabled easy retrieval and integration of private keys across domestic transactions.

Kaleido

Kaleido's Blockchain Business Cloud is a digital transformation platform providing complete enterprise blockchain solutions for today's modern business networks. UnionBank used Kaleido to accelerate the development and power the on-going operation of its inter-rural bank platform.

Amazon AWS

Amazon Web Services (AWS) is a secure cloud services platform, offering compute power, database storage, content delivery and other functionality to help businesses scale and grow. The Project i2i platform, powered by Kaleido, continues to run on AWS.



"Blockchain technology will revolutionize financial services, and more so in a context like the Philippines where financial inclusion is such a challenge."

ARVIE DE VERA

HEAD OF FINTECH
AT UNIONBANK

ABOUT KALEIDO

Kaleido is a digital transformation platform that offers blockchain-as-a-service, digital assets, smart contract management, network governance, insights and monitoring, collaboration services, apps and integration, along with a marketplace with third-party integrations, developer tools, and connectors.

Kaleido runs the leading industry multi-party consortia with built-in high availability, disaster recovery, and 99.99% uptime achieved over the last three years. Kaleido provides one native network across the major public clouds, across all global regions and on-premise deployments. It offers the industry's highest levels of security, compliance, performance, and scalability, along with enterprise SLAs and 24/7 support. It is the first blockchain SaaS to have achieved ISO 27K certification and SOC 2 Type 2 certification.

Global enterprise blockchain consortia in production today across insurance, trade finance, supply chain, payments, banking, healthcare, media and entertainment, retail, manufacturing, government agencies and NGOs rely on Kaleido for continued innovation across the open-source and blockchain communities.

To learn more, visit us at kaleido.io



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