Soramitsu
Central Bank Digital Currency Solution in Cambodia

SORAMITSU
ソラミツ

- Founded in 2016
- 70+ people
- Offices in 5 countries

HYPERLEDGER IROHA

We are the creator of Hyperledger Iroha and an active member of the Linux Foundation's Hyperledger Project; V1.0 released in May 2019

NATIONAL BANK OF CAMBODIA

We implemented a payment system based on Hyperledger Iroha for the central bank and regulator of the Kingdom of Cambodia, targeted at 18 million retail users

D3ledger.com

We are the technology provider to D3, a decentralized digital depository with the national CSDs of Slovenia and Russia

BCA GRUP BCA

We worked on an implementation of digital, self-sovereign identity with BCA Group in Indonesia

Polkadot.

We were chosen by the Web3 Foundation to create the C++ implementation of the Polkadot Runtime Environment

Project Bakong

BAKONG

Bakong is the **world's first retail payment system** run by a central bank, using blockchain technology. Currently **thousands of users** and **millions of dollars** worth of assets are flowing through the system.

Anyone with a Cambodian phone number can download the mobile app and access the mobile currency.
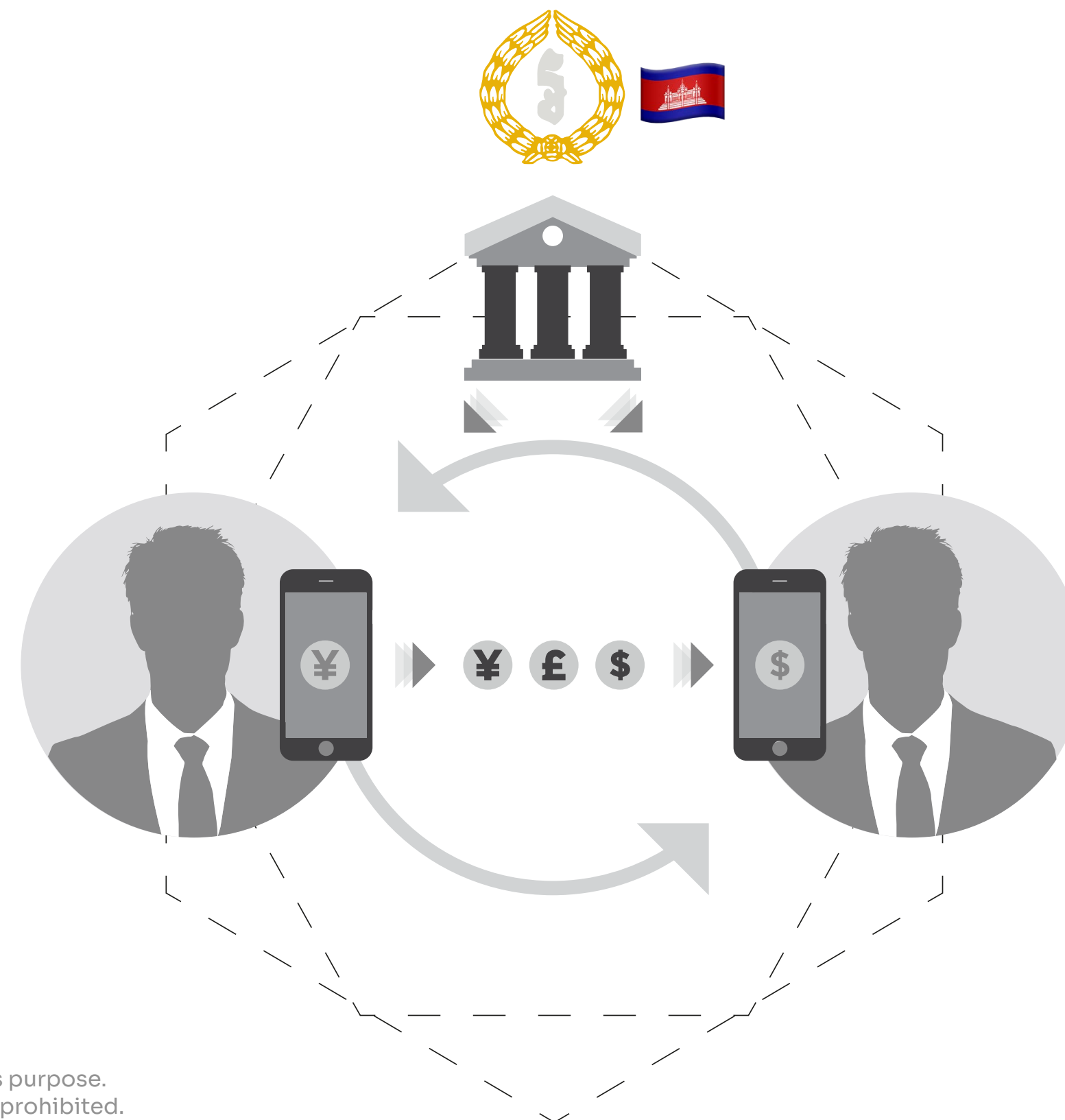
Money can be sent to another person and the transaction is recorded on the central bank's ledger.

Bakong: applications

Bakong consists of applications:

- **mobile** – for commercial bank clients to transfer money to registered users (using a QR code, phone number, or account ID) and to an existing bank account (deposit); **identity solution for onboarding**

- **desktop** – for commercial banks to manage bank accounts

- **web client interface** – for commercial banks to monitor clients' transactions, manage client limits, and generate reports

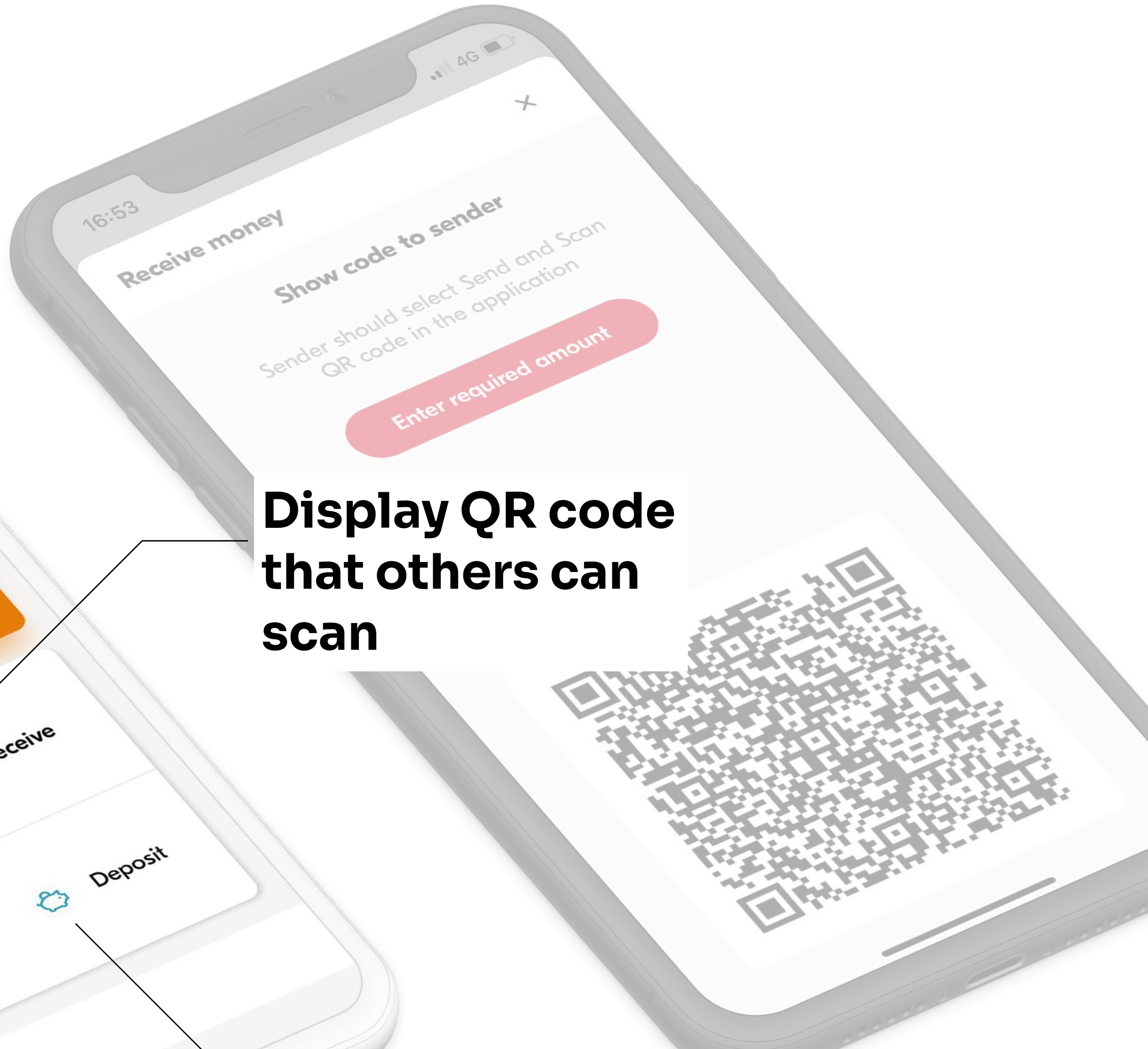- **physical cards** – for secure transaction signing

Mobile Apps
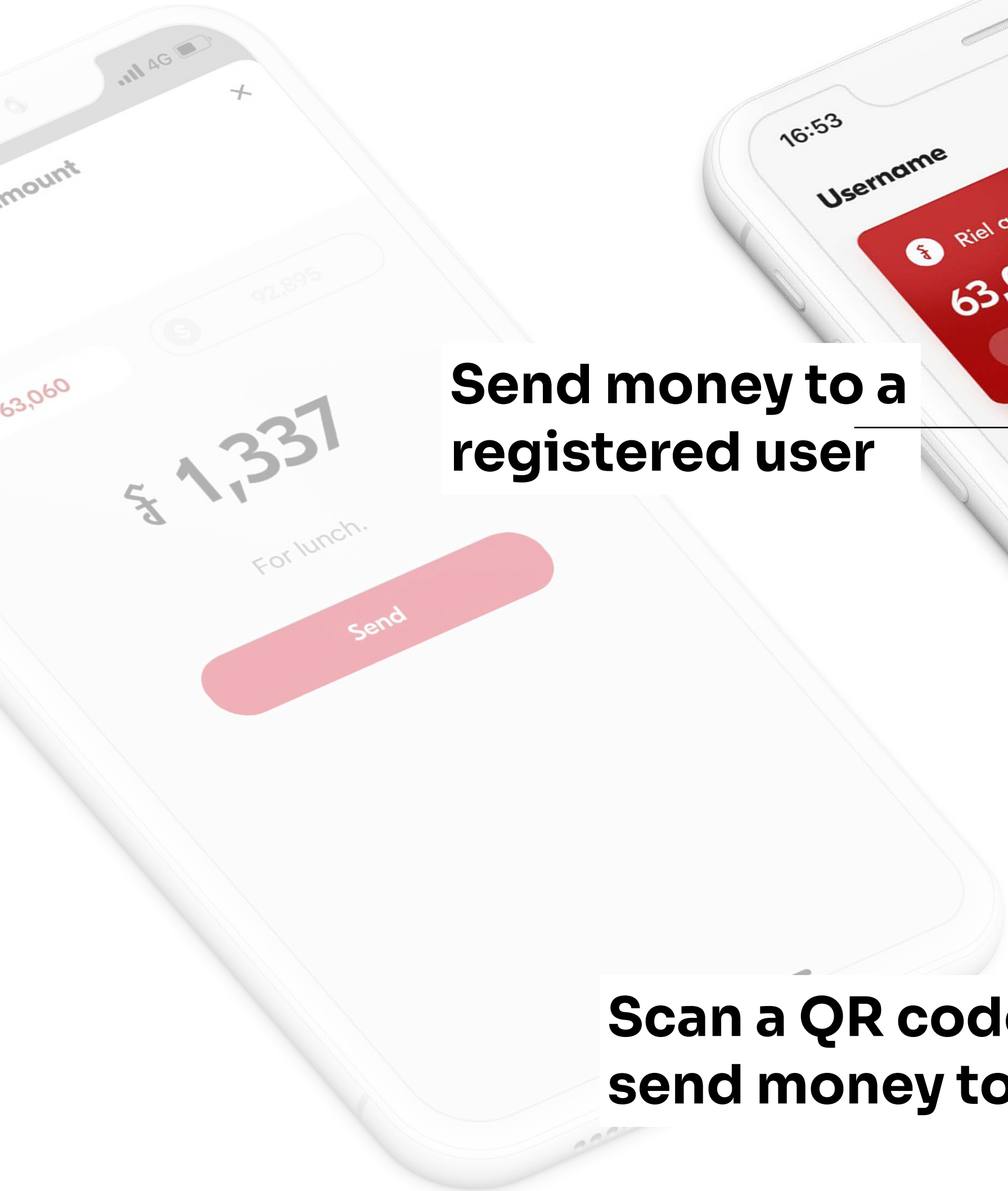
Send money to a registered user
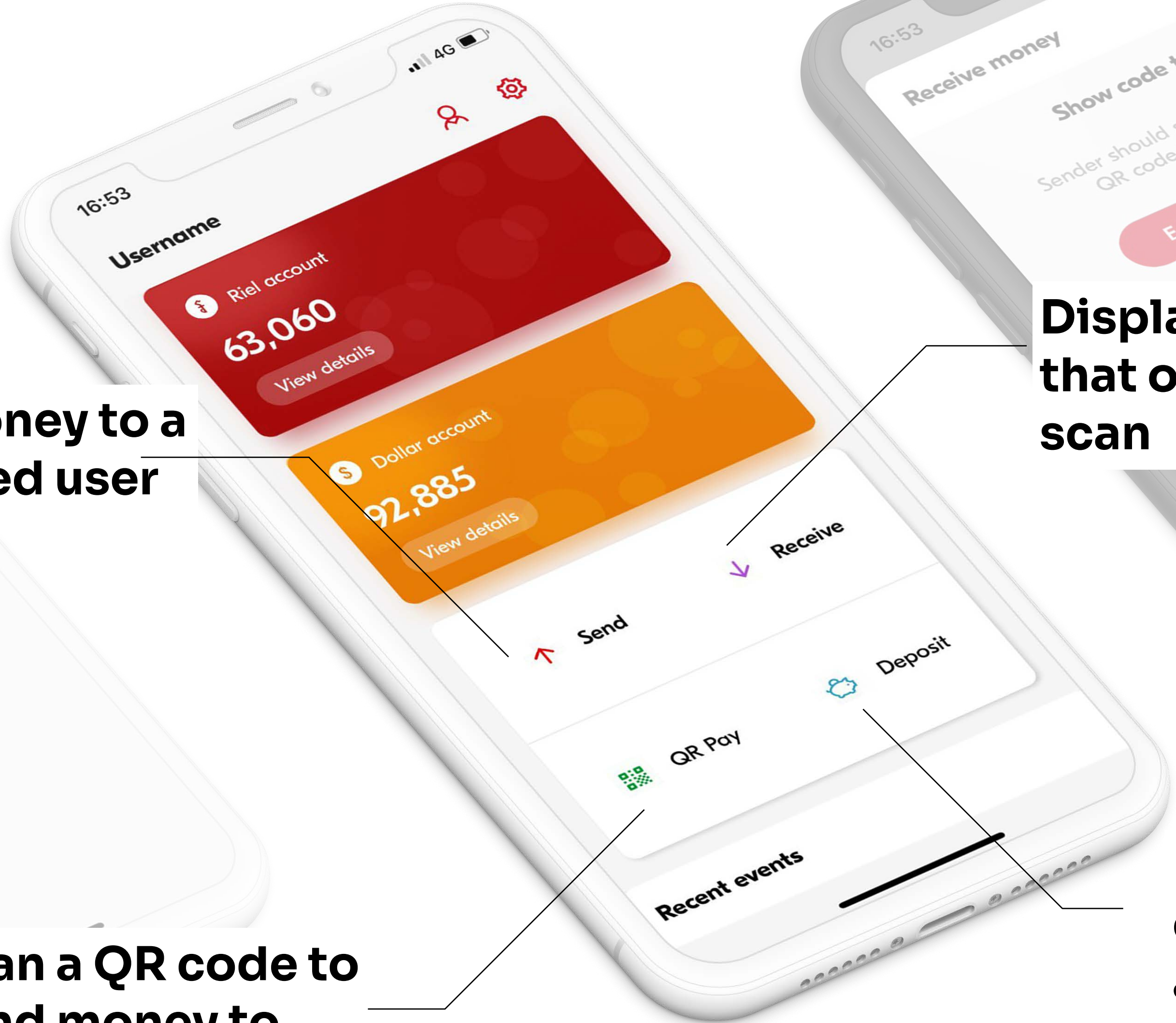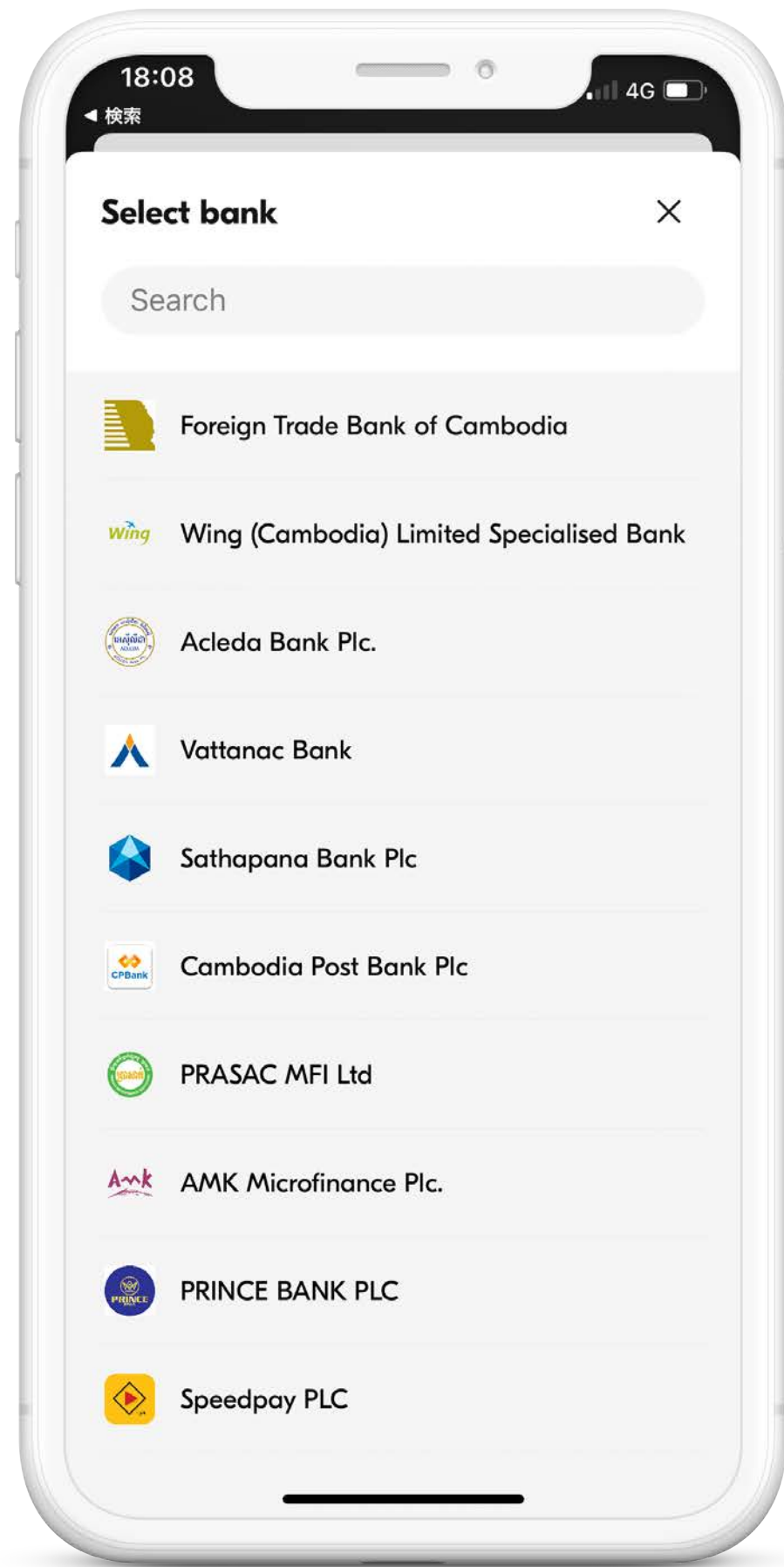
Scan a QR code to send money to
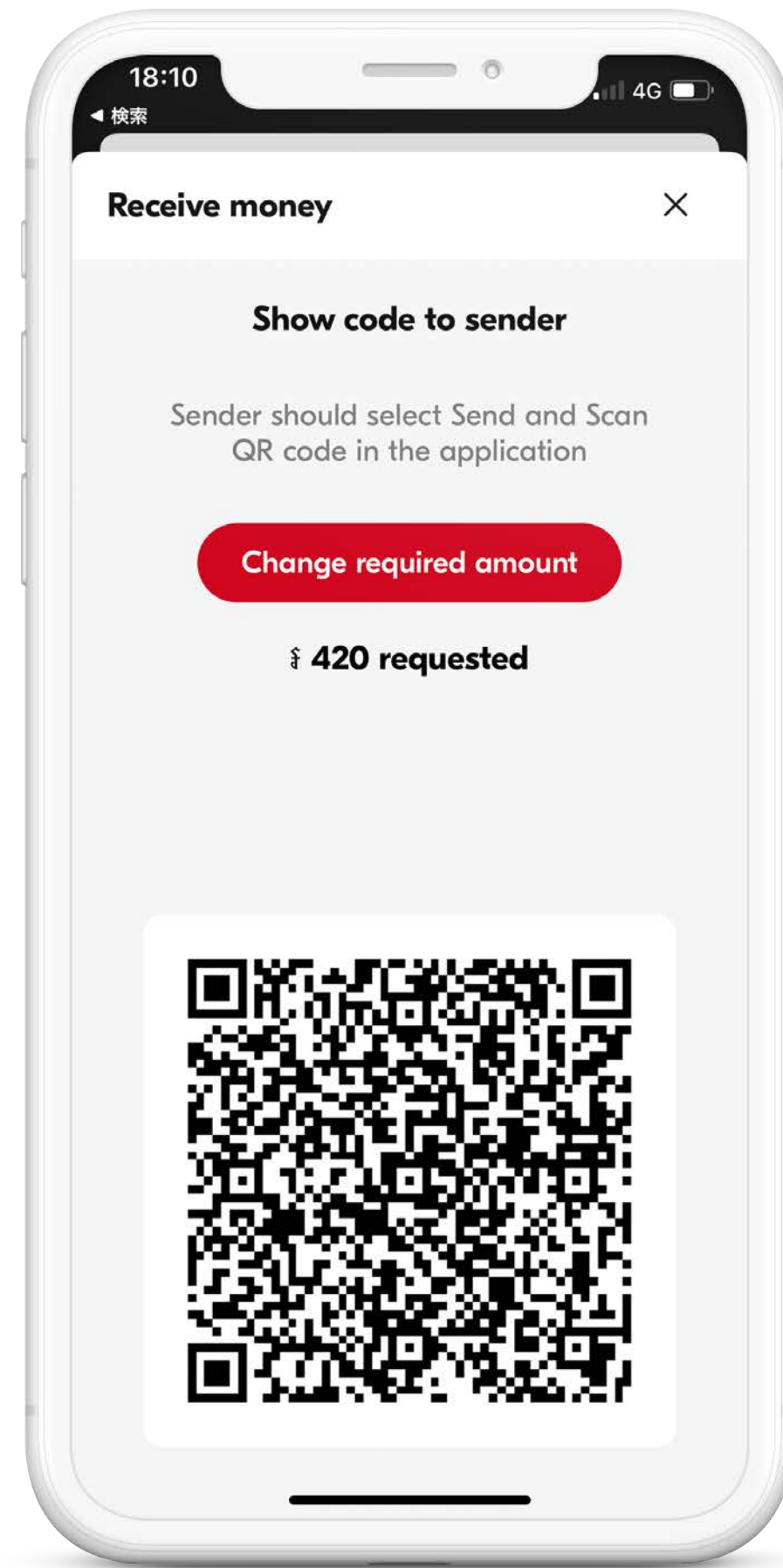
Display QR code that others can scan

Deposit money to an existing bank account
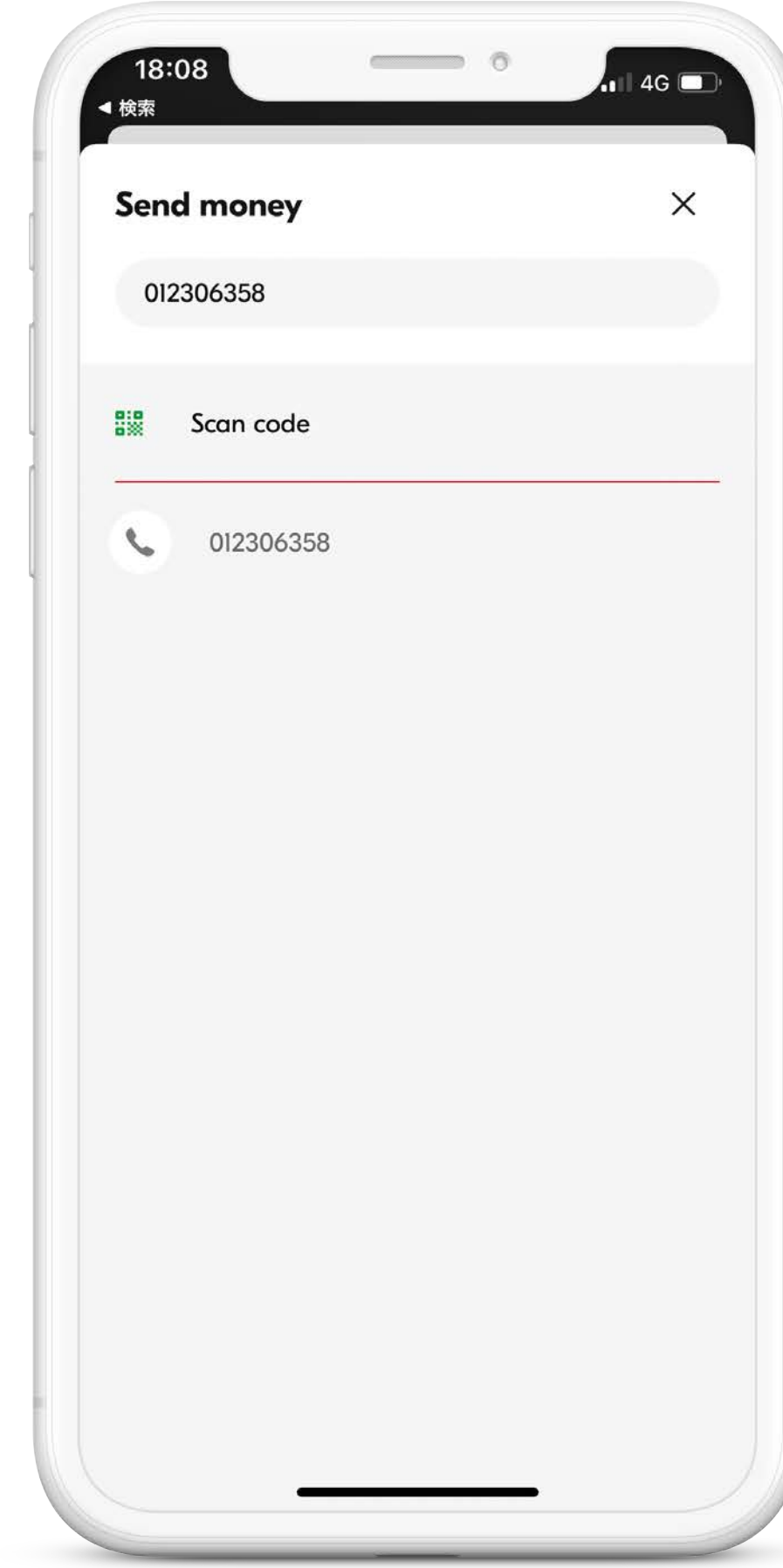
SORAMITSU
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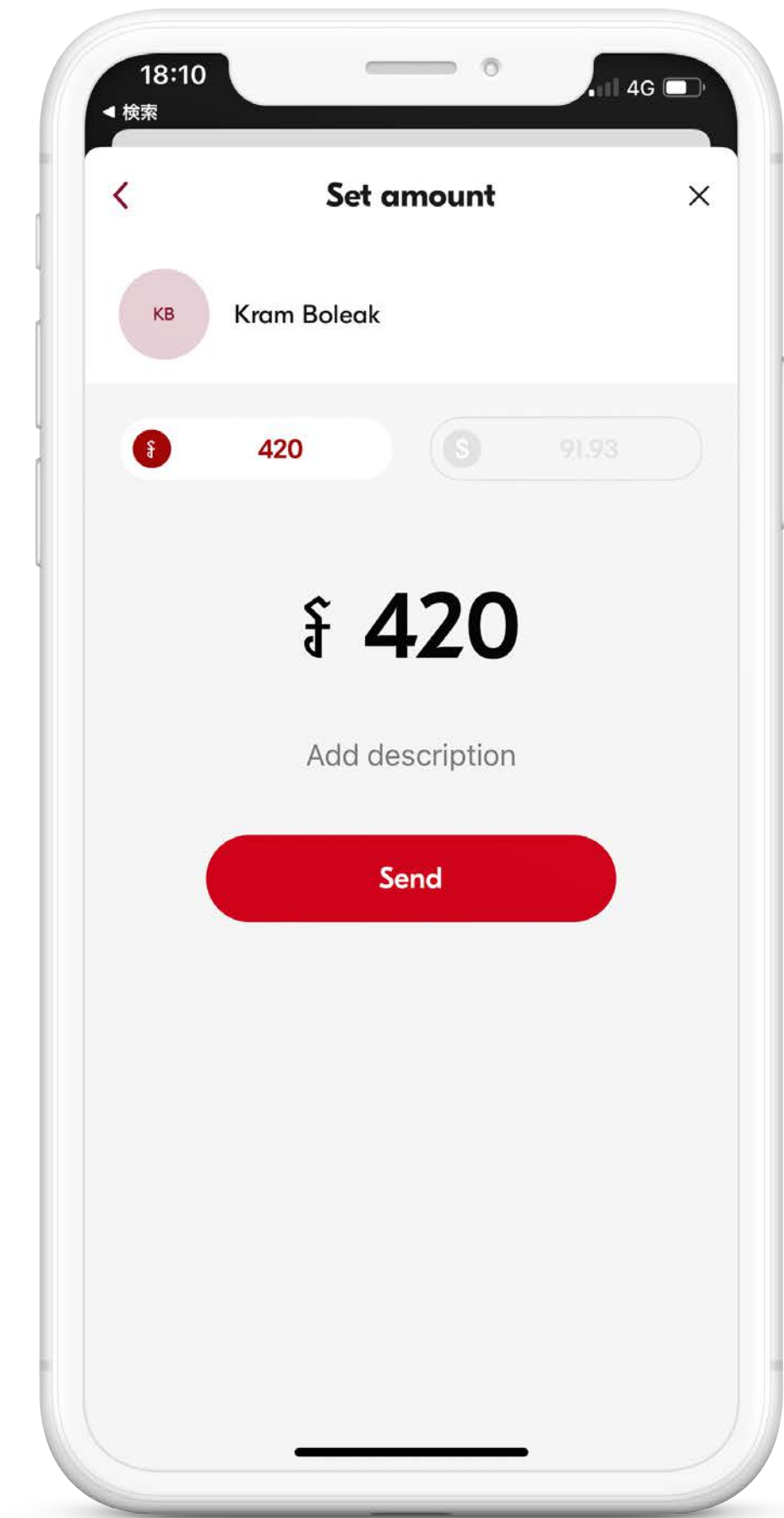**1** Create Bakong account and transfer from bank account to Bakong account

2 Make a payment by scanning a QR code...

3 or by sending money to a recipient's phone number

4 The payment can be easily sent

18:08 検索 4G

Select bank ✕

Search

Foreign Trade Bank of Cambodia

Wing (Cambodia) Limited Specialised Bank

Acleda Bank Plc.

Vattanac Bank

Sathapana Bank Plc

Cambodia Post Bank Plc

PRASAC MFI Ltd

AMK Microfinance Plc.

PRINCE BANK PLC

Speedpay PLC

18:10 検索 4G

Receive money ✕

Show code to sender

Sender should select Send and Scan QR code in the application

Change required amount

៛ 420 requested

18:08 検索 4G

Send money ✕

012306358

Scan code

📞 012306358

18:10 検索 4G

‹ **Set amount** ✕

KB Kram Boleak

420 $ 91.93

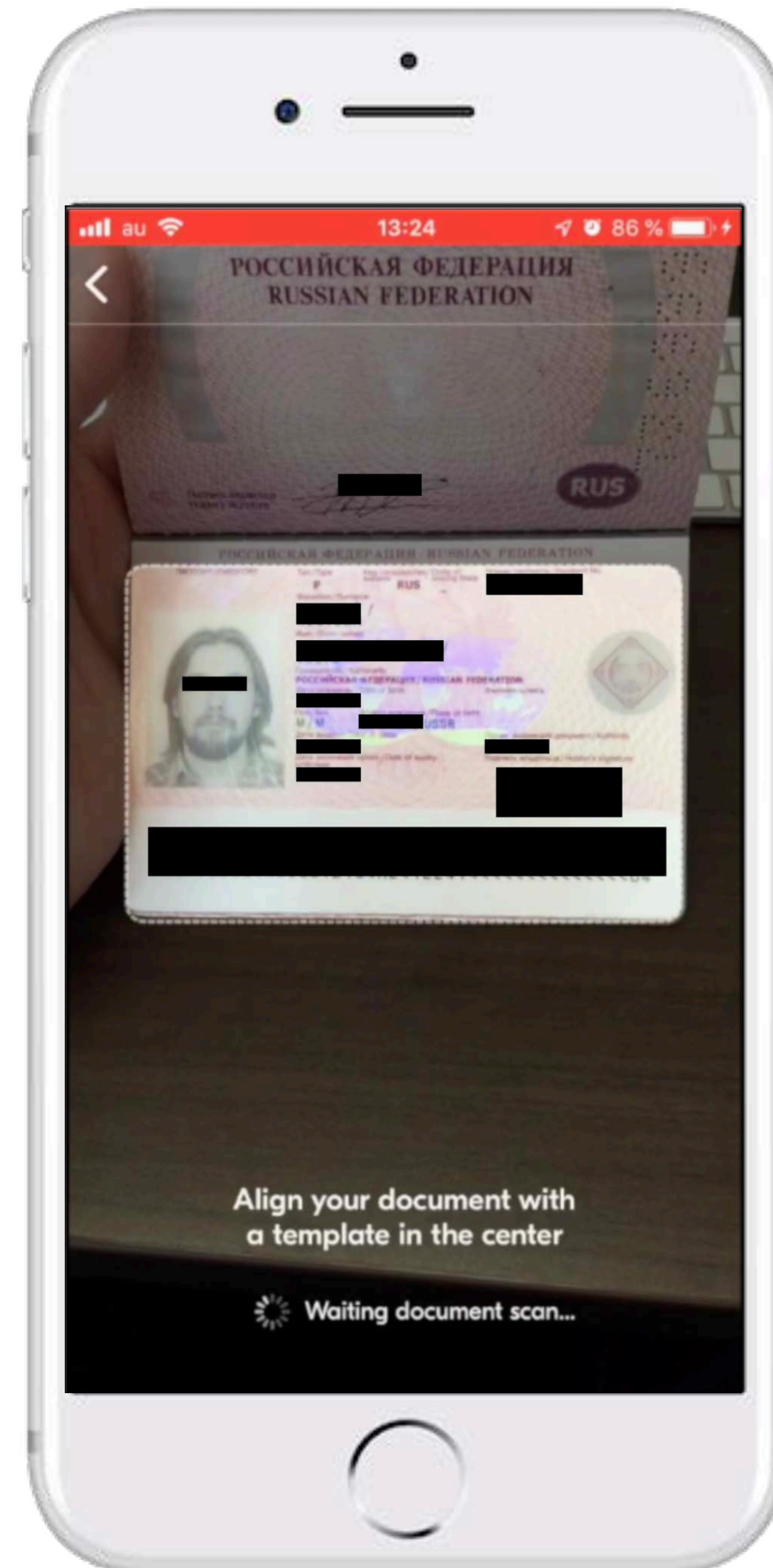៛ **420**

Add description

Send

Identity verification by face recognition

Selfie movie
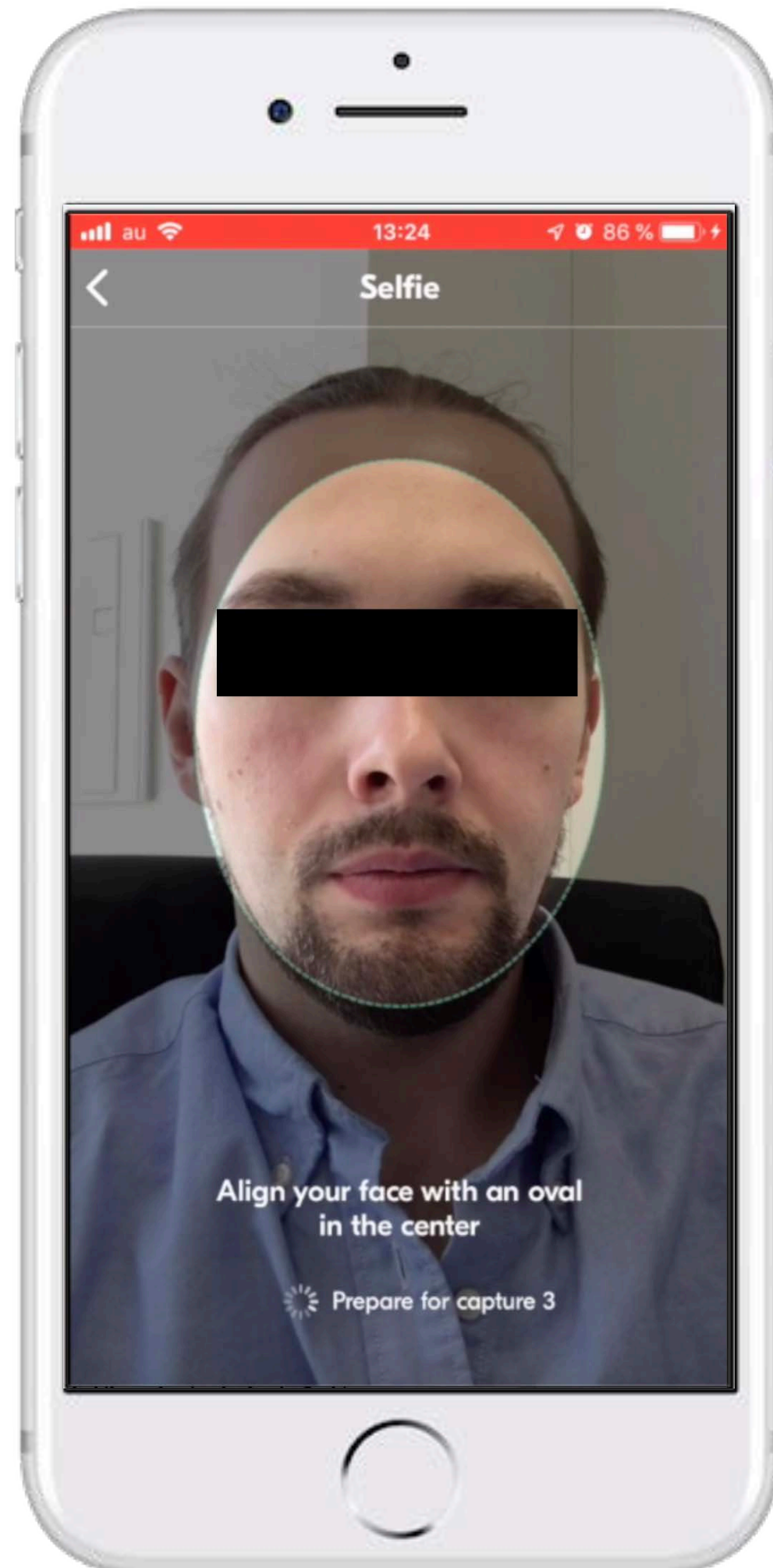
Shoot ID card

OCR
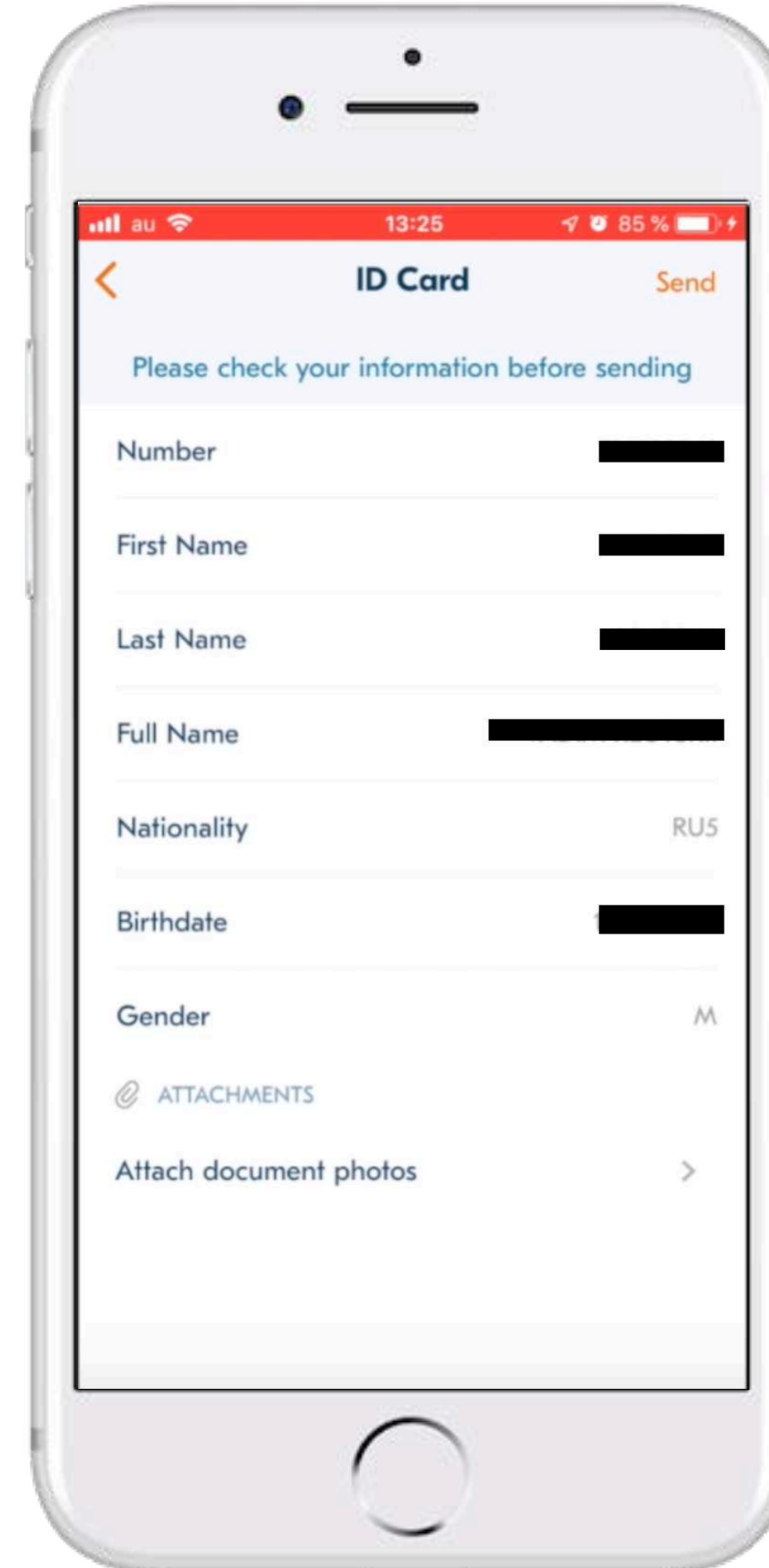
Calculate face similarity

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HYPERLEDGER IROHA

Regulatory Compliance

Settings ✕

Amount limits

$ 0 spent

₴ 113 spent

Currently you can send only $ 5,000 and ₴ 49,999 per day.

🛡️ Verify account and raise limit ›
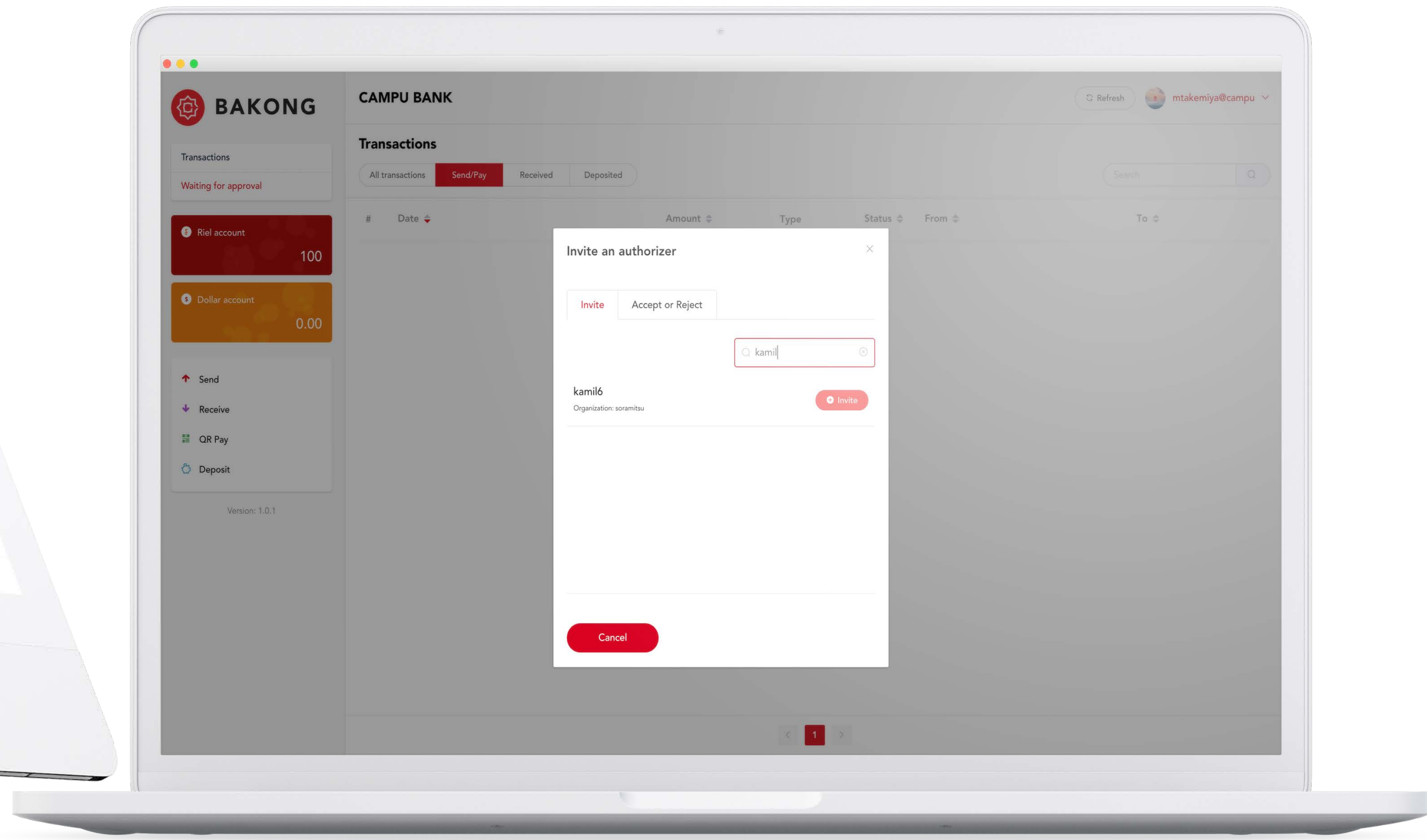
🌐 Language ›

❓ Help ›

Logout ›
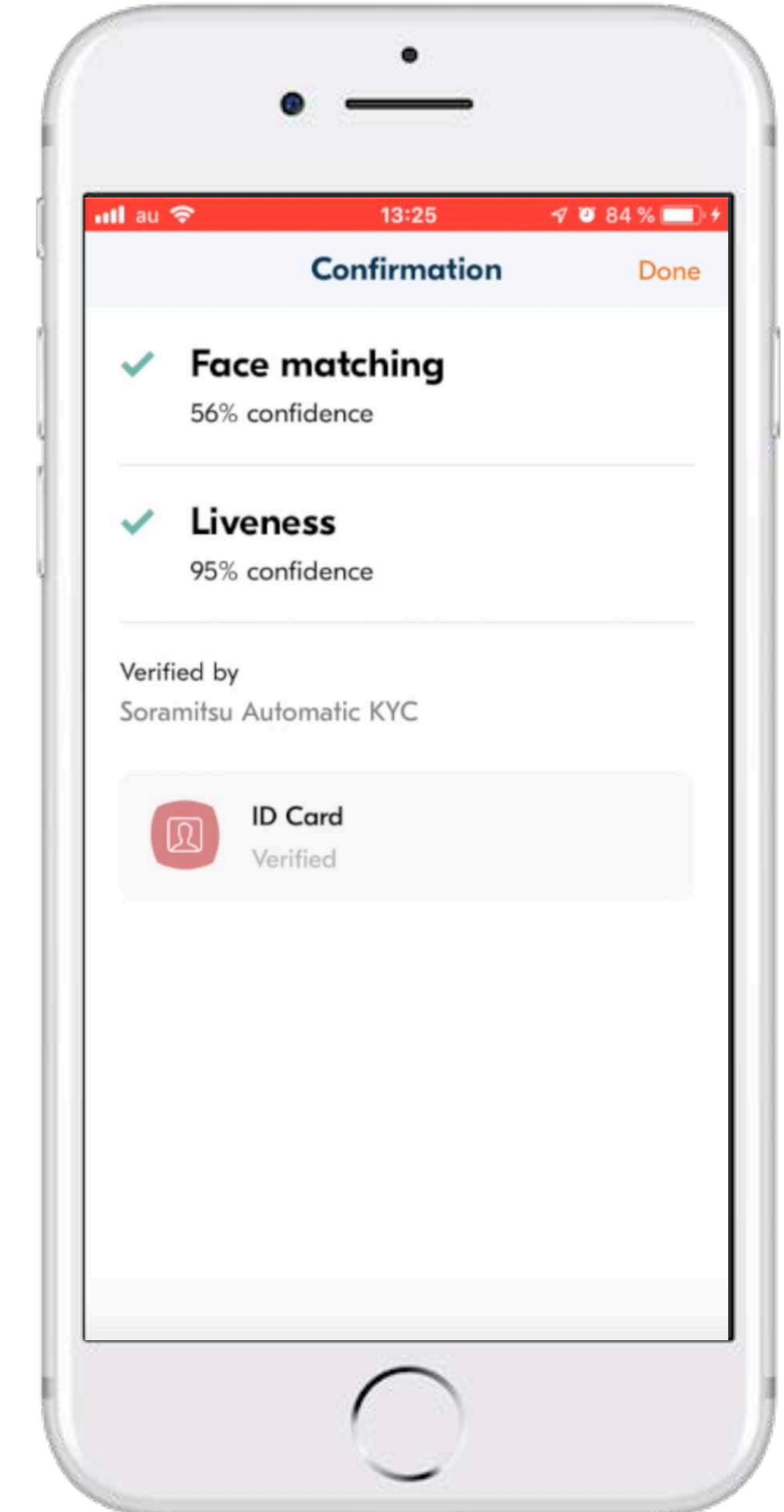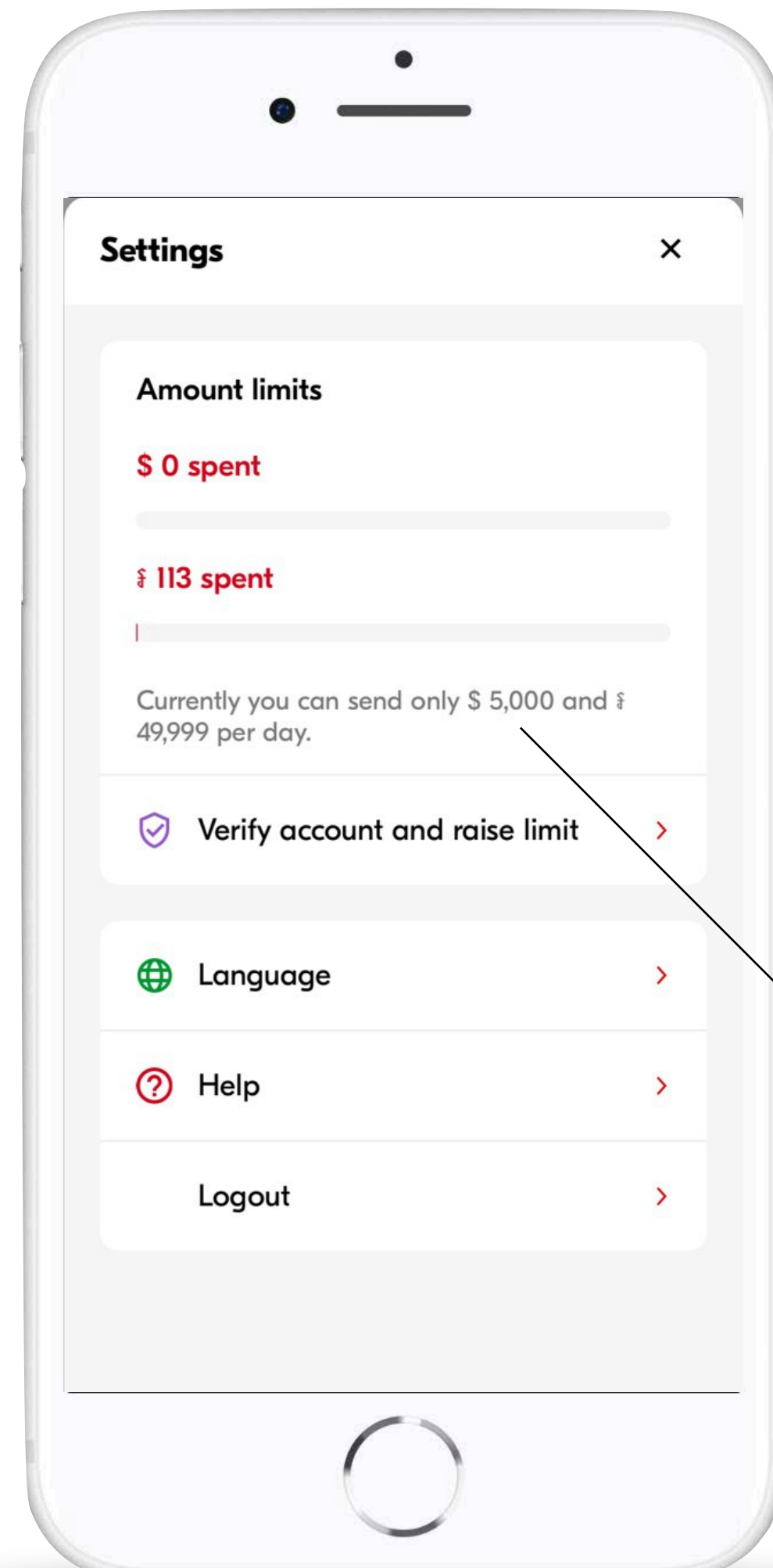
To comply with AML regulations, by default spending limits are $250/day. To increase their limits, a user must go to a commercial bank to do verification

Desktop Apps

Unified Architecture, 2 Tiers

- Bakong uses a **2-tier architecture**, where the **central bank provides an interbank ledger** of all transactions and **each commercial bank provides access** to transact on the platform to their users

- Ground truth about the balances of money in the economy is at the central bank's ledger (Hyperledger Iroha blockchain)

Participant 5

Participant 4

Participant 6

HYPERLEDGER IROHA
NBC Bakong Core

User Accounts

Participant 3

User Accounts

Participant 1

User Accounts

Participant 2
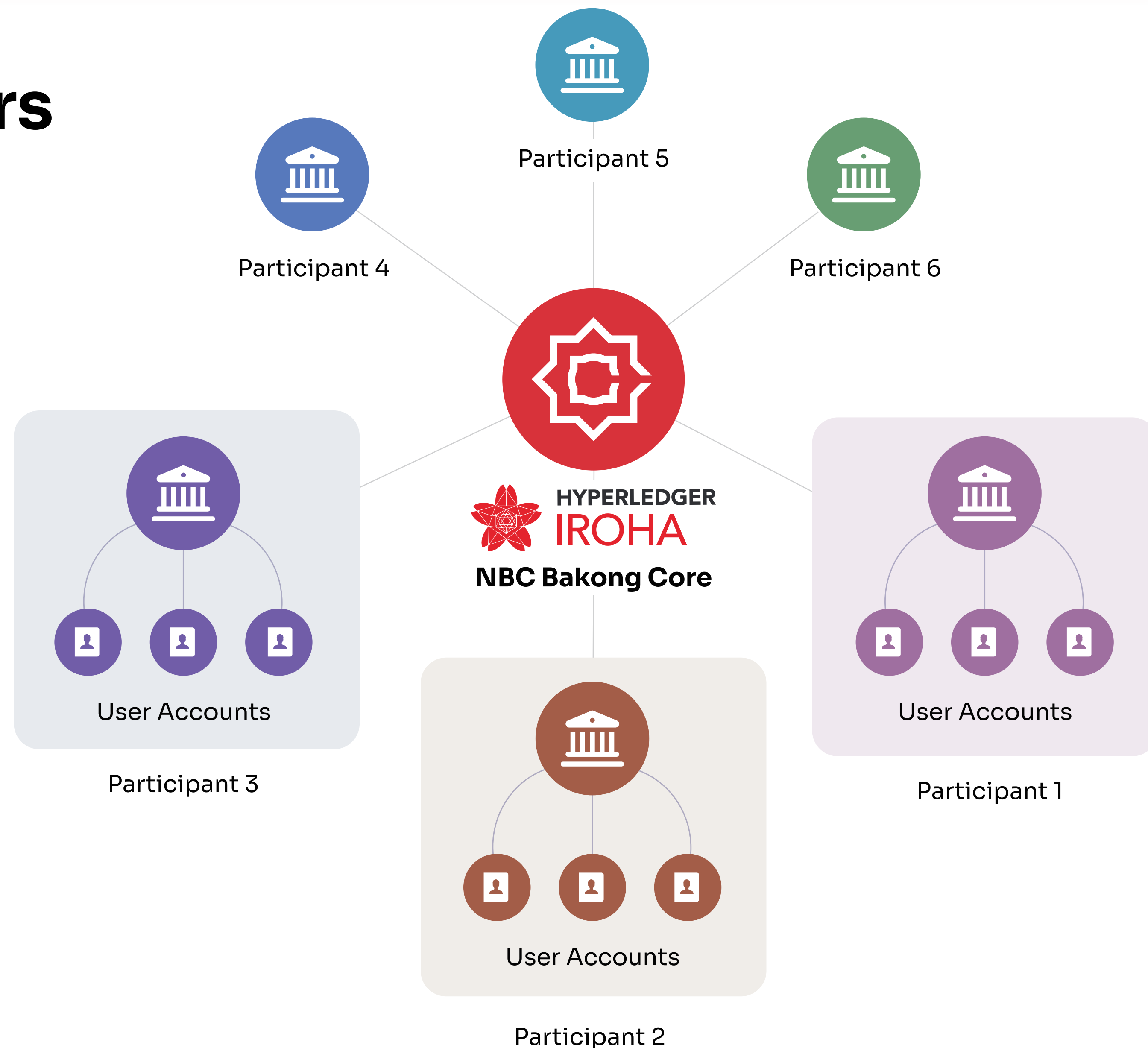
Bakong: Mobile Payments (Retail Settlement System)

NBC Bakong Core

Blockchain platform is run by NBC as the central bank and regulator; only NBC has access to all transactions
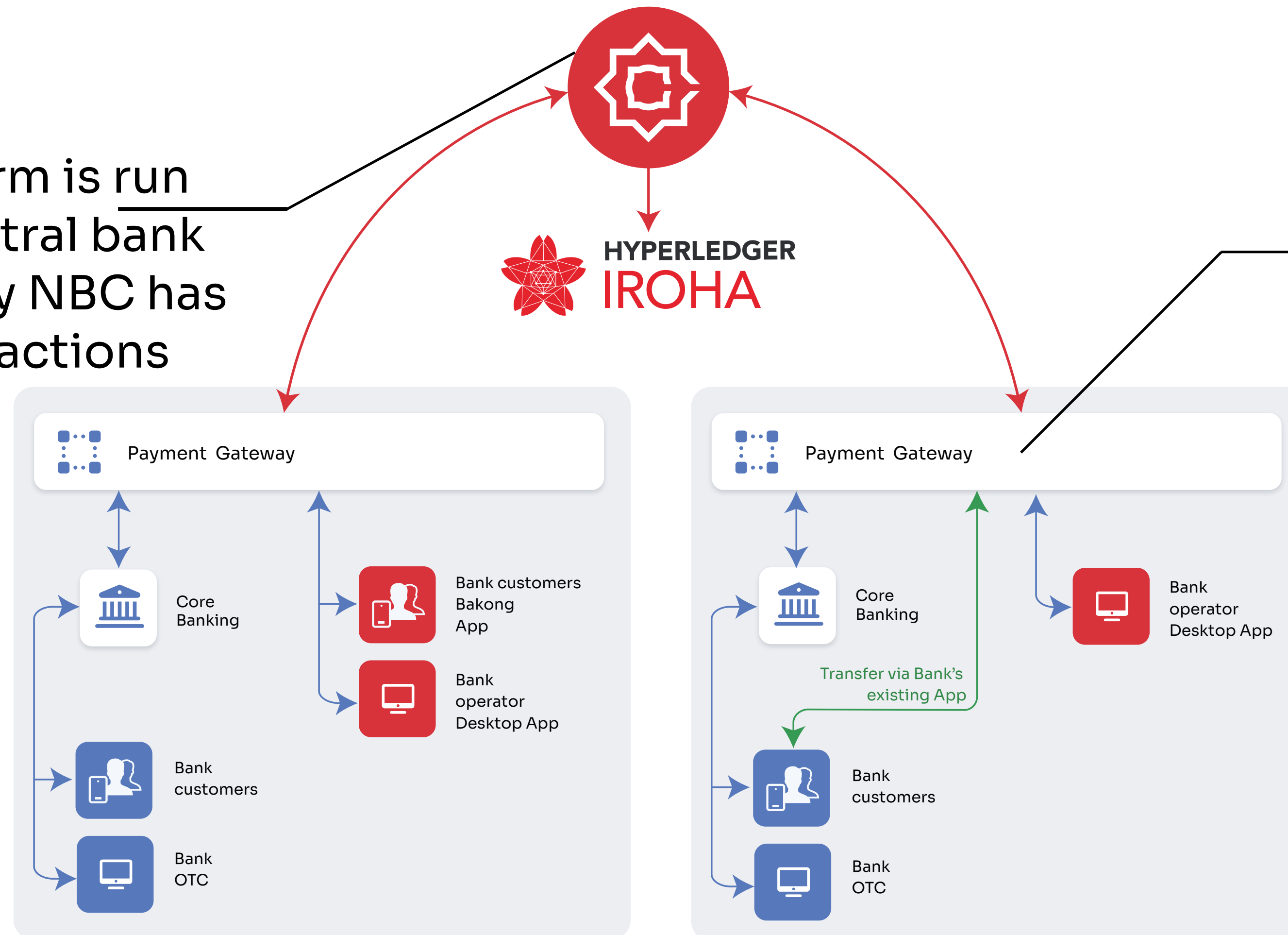
Commercial banks:
- run mobile API servers that provide access to the Bakong system; commercial banks can only monitor the transactions of their own users;

- desktop API and app to manage bank and branch accounts;

- integration with the Core Banking System via ISO20022 messaging

Payment Gateway

Core Banking

Bank customers Bakong App

Bank operator Desktop App

Bank customers

Bank OTC

Payment Gateway

Core Banking

Transfer via Bank's existing App

Bank operator Desktop App

Bank customers

Bank OTC

Why Bakong?

- **Large unbanked population:** Only 22% of Cambodians (>15 years old) have bank accounts

- **Large remittance market:** Domestic money transfers are common, yet still costly

- **Missing out on Internet commerce:** Very few credit cards and means to pay digitally

Bakong in the News

A street view of the National Bank of Cambodia headquarters in Phnom Penh. 📷 Heng Chivoan

NBC signs blockchain agreement

Mon, 24 April 2017 Kali Kotoski

The National Bank of Cambodia (NBC) has signed an agreement with a Japanese firm to develop a blockchain-based payment system that could potentially allow for the regulated usage of a cryptocurrency, which would eliminate the use of formal financial institutions to send and receive money.

According to an announcement on Friday from the Japanese financial technology firm Soramitsu Co, the company signed a partnership agreement with the NBC to study the possible implementation of a blockchain-based open-development software known as Hyperledger Iroha, a product backed by the Linux Foundation, a US-based company that distributs the ledger technology program.

40以上の中央銀行がブロックチェーン技術の導入検討：WEFレポート

"The National Bank of Cambodia plans to introduce blockchain technology into the payment system by the end of 2019."

"The most surprising thing about Cambodia's plan is the fact that it's going to be a large-scale development with more than 10 banks participating, not starting as an experimental program."

https://www.weforum.org/agenda/2019/04/this-new-form-of-currency-could-transform-the-way-we-see-money/

Bakong Pilot Launch on July 17, 2019

Why Blockchain?

- Can simplify payments architecture by having both core banking systems and RTGS on the same platform

- Increase efficiency of payment systems by creating a protocol for digital money

- Create a trust-minimized system

- Give users mathematically provable property ownership

Potential Economic Impact in Cambodia

- **Savings of over $360M annually** due to increased efficiency of transactions and costs of handling cash

- Increase the number of Cambodian citizens with a bank account

- Increase transparency of financial transactions to allow for better monetary policy, credit expansion, and economic development planning

- Increase trust in the banking system

- Increase peer-to-peer commerce and velocity of M1

- Reduced transaction costs at scale

Effects on Monetary Policy

- New opportunities to do targeted monetary policy

- No negative effects, as retail users can have a limit on how much they can have in their wallets, so no competition with bank deposits
  - Our system is merely a replacement for carrying around small amounts of cash in your wallet

Potential for Cross-Border Transfers

- The Bakong system allows retail users to send & receive money using their mobile device

- If two commercial banks or central banks link their settlement to the system, this can allow retail users across borders to send & receive money

- FX operations can be provided by an intermediary with large reserves, or a two-tier currency could allow for conversion between currencies with little friction

- Digital currency can be tracked from mintage to the current transaction in order to reduce risk of money laundering and illegal activity

Comparison to E-Money
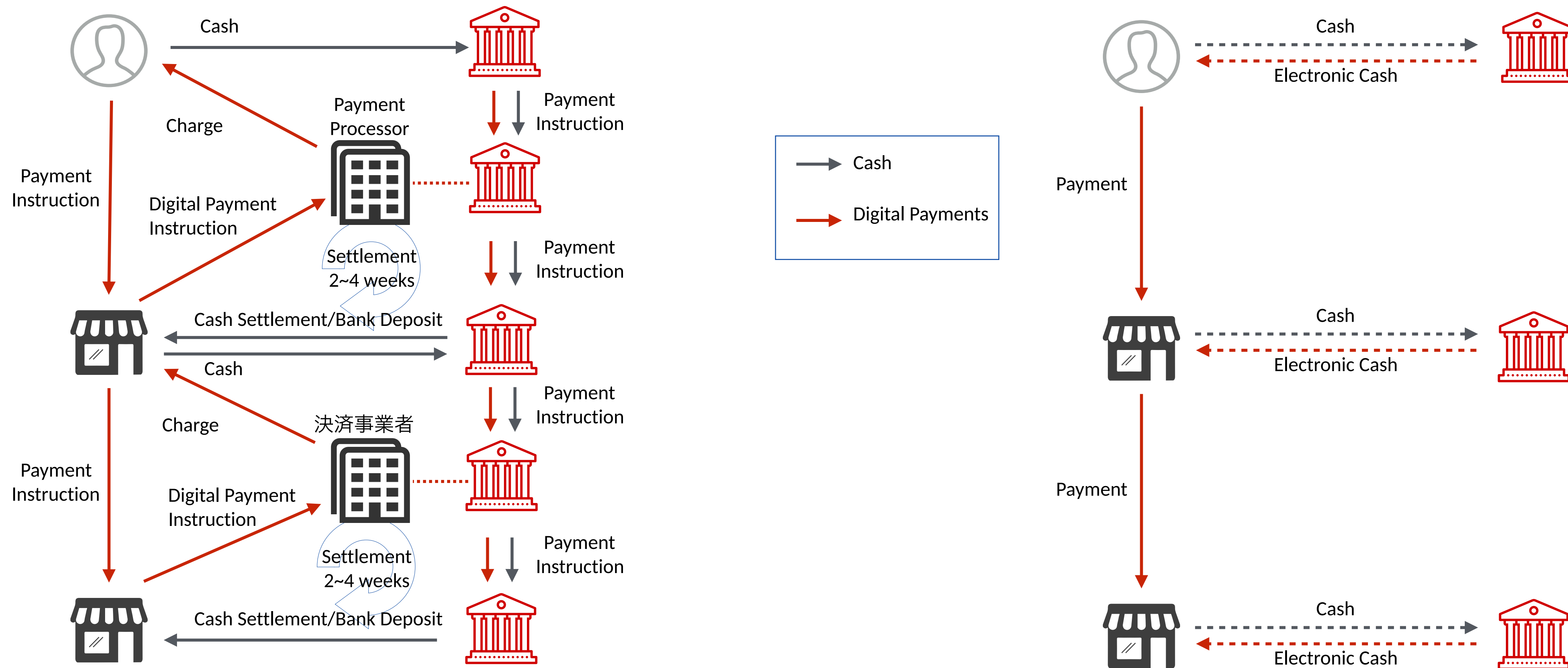
Adapting the Bakong System to Ukraine

- Can more or less run the Bakong system "as-is"

- In Ukraine, more nuanced KYC tiers is recommended

- Set up a KYC utility that all banks in Ukraine can access and take advantage of to increase compliance and reduce costs
    - This is a Bank ID system and unrelated to other forms of government ID; therefore it falls under the prerogative of the central bank

System architecture

✓ Same 2-tier architecture as in BAKONG:

- The core system is run by the National Bank of Ukraine

- All users are customers of a commercial bank

Expected Economic Impact in Ukraine

- **Savings of over $1.3B annually** due to increased efficiency of transactions and costs of handling cash

- Increase transparency of financial transactions to allow for better monetary policy, credit expansion, and economic development planning

- Increase trust in the banking system

- Increase peer-to-peer commerce and velocity of M1

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