
sikoba
Alex Kampa
Research Director
{ building a decentralised IOU platform on blockchain }

sikoba

“Money” and its meanings

In casual use, the word “money” carries a very wide range of meanings.

We need more precise definitions, mainly to distinguish between:

- **Money-things**
- **Money-tokens**

Origins of private property and money

Early humans had very little personal belongings, their survival depended on sharing. Among items that were not subject to communal sharing were body adornments: amulets, talismans, lucky stones etc. These probably played a role developing concepts of private property and value.

Until the 20th century, cowrie beads were used as both body ornaments and “money” in many parts of the world. [img: Nigeria 19th c.]

sikoba

Money-things

Cowrie shells / wampum

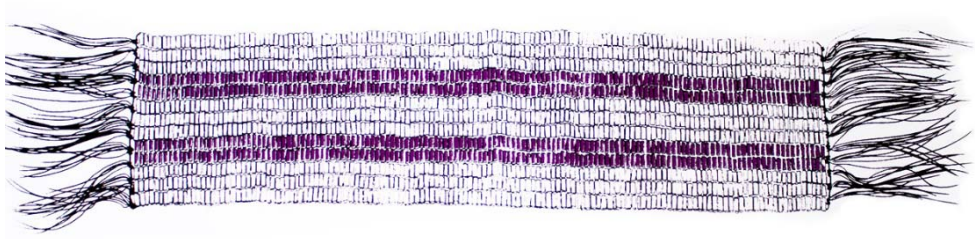
Embroidered cloth

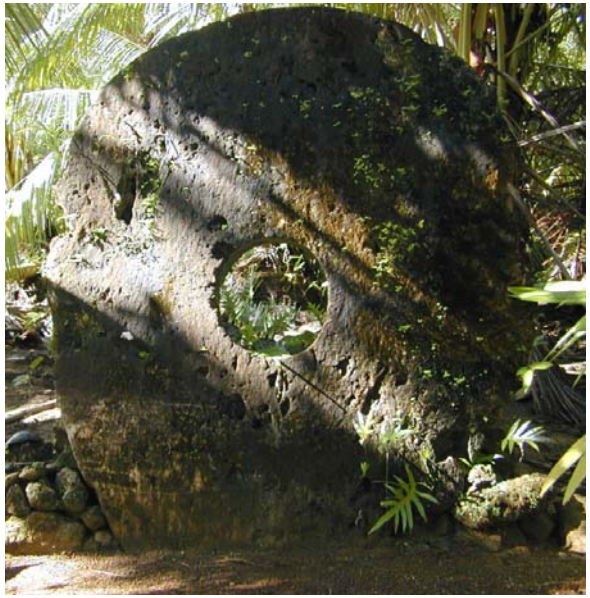
Grain (barley, …)

Metals (gold, silver, …)

Brass rods

Carved stones





sikoba

Uses of money-things

- Trade
- Ceremonial
- Social (marriage)
- Gift / exchange (political, inter-group relations)

Some money-things were used in a way that at least resembles how we use money today.

Other money-things might just be called “valuable artefacts”.

sikoba

Emergence of “modern” money: money-tokens in Mesopotamia, 3,000 – 2,000 BC

People gradually learned that the use of physical money-things can be replaced by money-tokens, which represent a promise of a money-thing.

Emergence of a banking system (from temples to commercial banks), trade finance, bank accounts.

Clay tablets representing IOUs circulated widely.

Significant proportion of women as heads of banks and companies during heyday

sikoba

Tamper-proof debt notes

An IOU often consisted of a clay casing that contained a smaller clay tablet.

The casing contained the complete terms of the IOU. The inside tablet repeated most of the information.

This protected the issuer from fraudulent alteration, as the inside table could not be accessed without breaking the casing.

sikoba

Money-tokens = commercial money = money proper: Basis of a dynamic economic development

Money-tokens are:

- Widely accepted
- Standardised / fungible
- Usable as scriptural money
- Based on credit (of the issuer)

Their introduction allowed economies to grow independently of the actual availability of the underlying money-thing (the “currency”)

sikoba

Money-thing

Initially a physical thing or commodity, with some commonly agreed-on characteristics and value

Can be owned outright

Definition can be extended to cryptocurrencies

Money-token

A claim on an issuer, in whatever form, including entries on a bank ledger

Value given by the issuer's credit

Cannot be owned – the holder is party to a contract

Is denominated in a money-thing or an abstract unit (the "currency")

NB: coins made of valuable metal can be both money-thing and money-token

sikoba

On coins and precious metals

Coins in Antiquity:

- were introduced much later then scriptural money
- Relatively rarely used for everyday transactions
- Precious metals used only to indicate value

Gold standard:

- Relatively modern invention (17^{th}-20^{th} centuries)
- Based on incorrect knowledge about ancient monetary systems
- Even with a gold standard, most money was credit-based (ex: GB 1797)

sikoba

The Banking Law Journal, May 1913

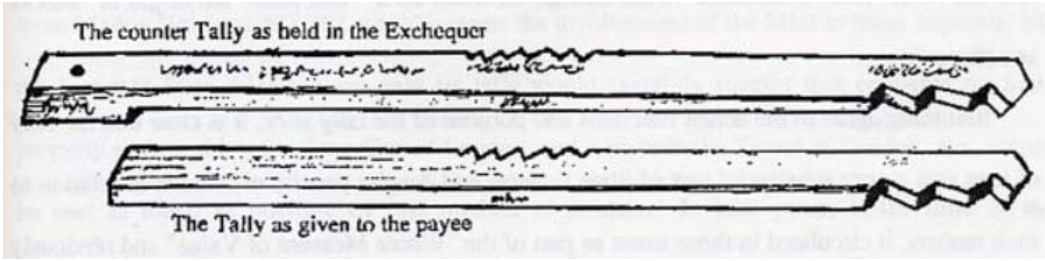
WHAT IS MONEY?

By A. Mitchell Innes.

Credit is the purchasing power so often mentioned in economic works as being one of the principal attributes of money, and, as I shall try to show, credit and credit alone is money. Credit and not gold or silver is the one property which all men seek, the acquisition of which is the aim and object of all commerce.

sikoba

Pervasiveness of credit



- Tallies
- Medieval Fairs
- Merchant tokens
- Local credit systems throughout history


GUINNESS


陳氏百貨商場
TANG FRERES
2014
BONNE ANNEE
2014

sikoba

The trend towards monolithic money

Before:

- Paying on credit was part of everyday life
- Variety of monies circulating in parallel
- Variety of credit levels and geographical reach (local monies)

Today:

- Credit (as opposed to bank loans) is much less used
- Usually only one type of money
- Money is used only by banks, including the central bank, meaning that in most countries today, **money = bank credit**

sikoba

The role of banks: credit conversion

Because nowadays the equation “money = bank credit” holds, banks are need more than before.

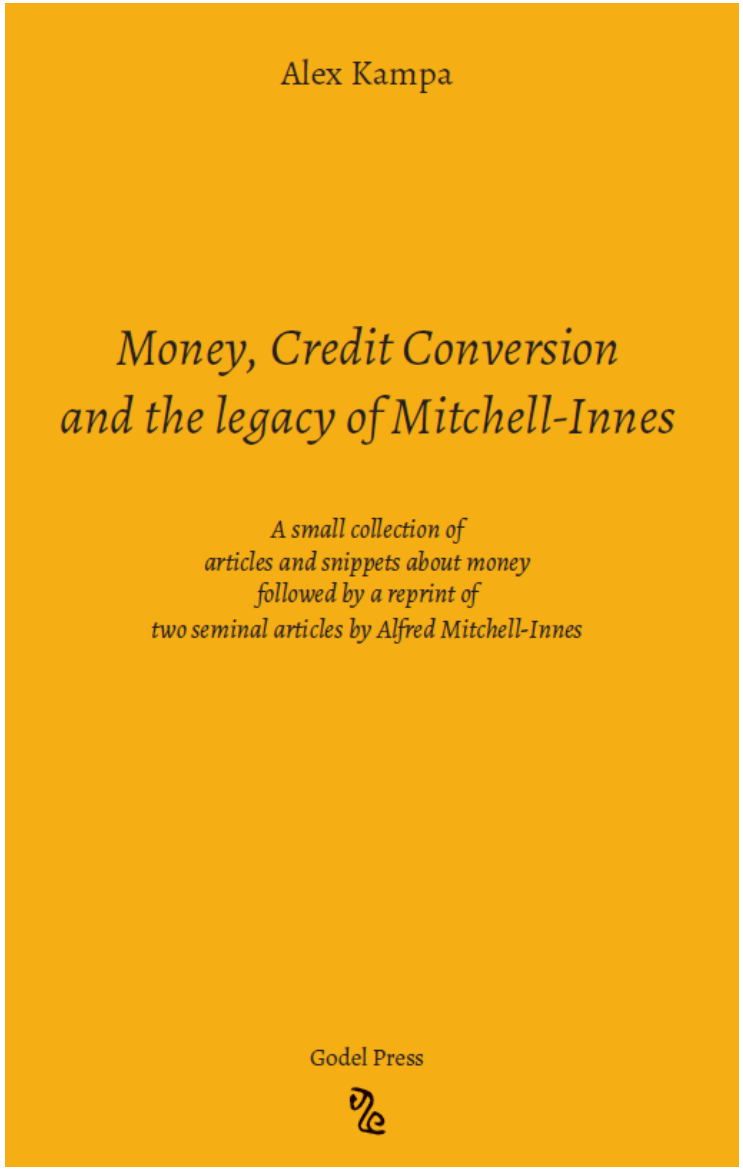
Their essential role is to convert / elevate the credit of individuals and companies into their own credit, which is money.

To do this credit conversion, banks are not restrained by the central bank. The concept of “fractional reserve banking” is not correct.

sikoba

Credit Conversion

The Credit Conversion Theory of Money focuses on one key aspect of the credit theory, namely how debt is converted into money.



sikoba

We have (partly) forgotten how to use credit …

… but we have banks, credit cards etc

So what is the problem?

Where are the unbanked?

SOURCE: World Bank

sikoba

Access to finance for the underbanked

Microfinance: average interest 35% p.a.

Money lenders: up to 1% per day = 1,000% p.a.

For some: ∅ (= zilch, nada, …)

M-pesa: commissions >10% for small transfers

sikoba

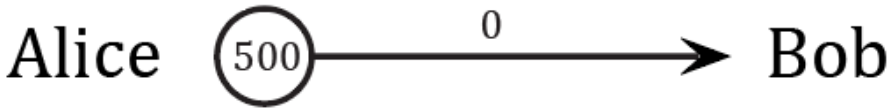
The sikoba project:

Payments based on trust, without money or third party

"There's a lot you can do without money, as long as you have credit"

Accepting credit

Bob trusts Alice and accepts her credit for up to €500.



This is like opening a credit line, which is initially unused. Alice will decide whether to use the credit line or not.

Paying by drawing on a credit line

Alice is now able to pay Bob, and she may decide to do so:

Note that **no money changes hands**. “Paying” in this context simply means that Alice has a debt towards Bob.

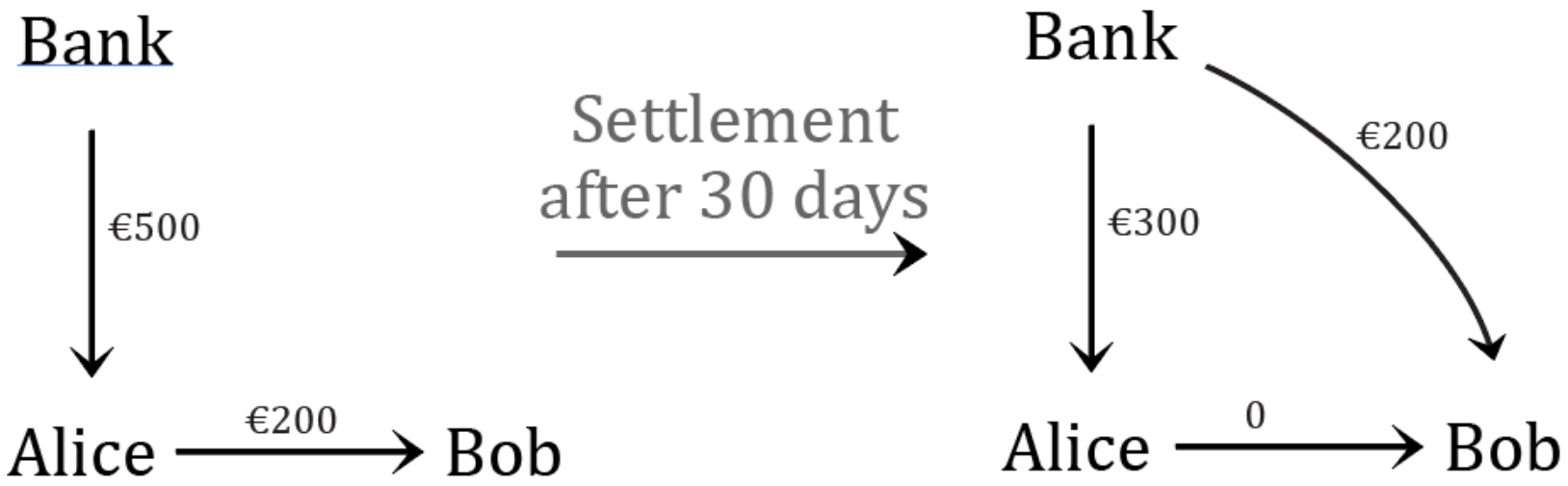
Credit conditions

There may be conditions attached, such as an interest rate.

sikoba

Ssettlement

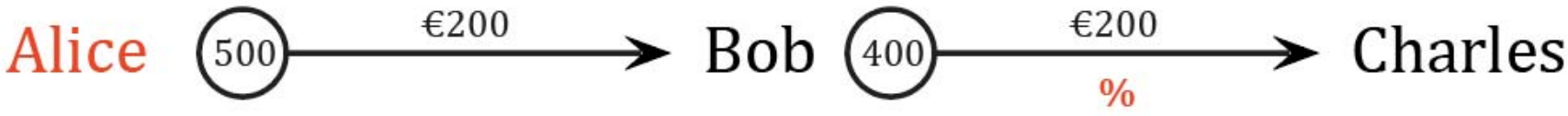
Settlement of outstanding debt using bank credit (i.e. money).



sikoba

Credit conversion

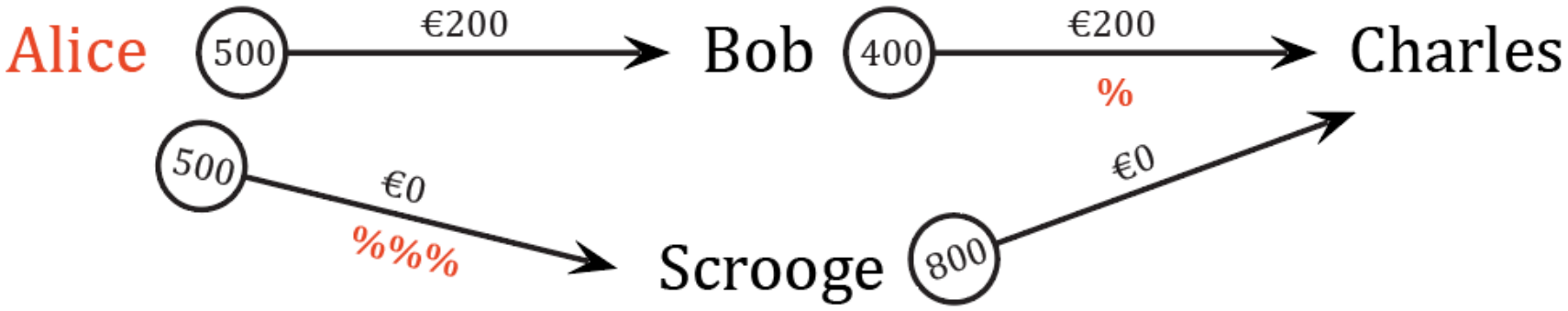
When there is no direct trust relation, payment goes through trusted intermediaries.



sikoba

Optimal payment path

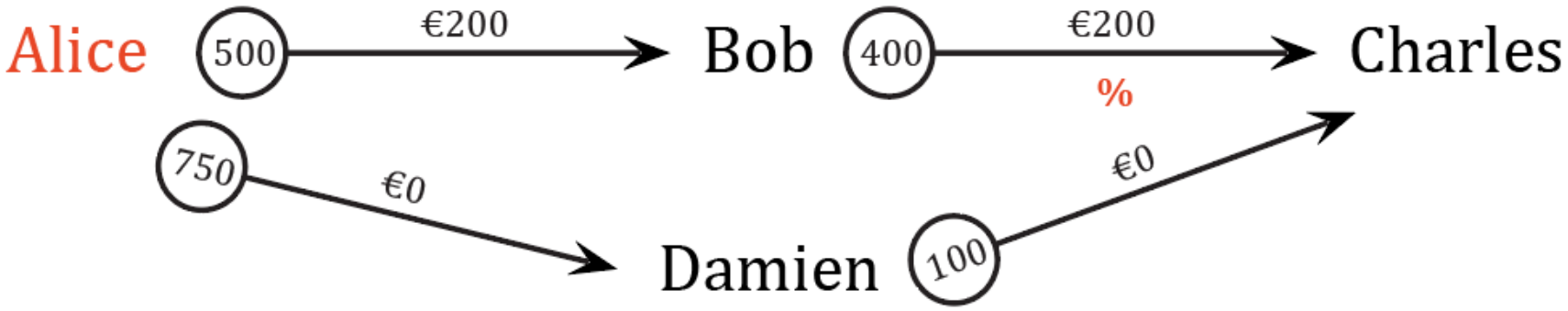
The system finds the “cheapest” credit conversion path for the credit taker.



sikoba

Optimisation (1)

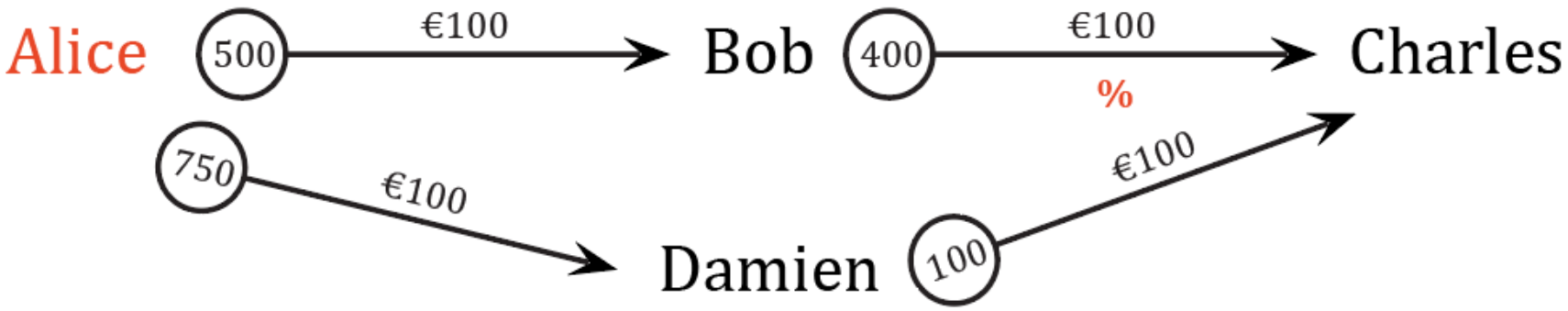
Credit relations may change over time



sikoba

Optimisation (2)

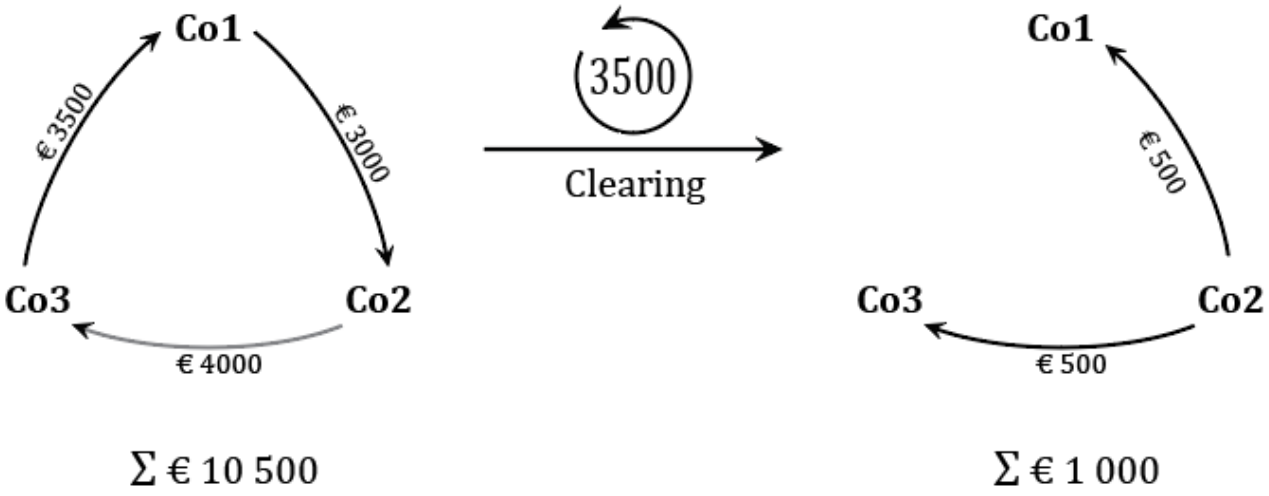
The system adjusts credit relations to reduce costs for the credit taker.



sikoba

Clearing

Clearing will be done either continuously.



sikoba

Vision

P2P payments and remittances:

+ have already reached $1 trillion globally

+ share of mobile payments small but growing fast

P2P lending:

+ $26 billion globally in 2015 (excluding China)

+ growing at 50% p.a. and expected to reach $900 billion by 2024

P2P IOUs:

+ a new market sector ready to emerge


Example Bangladesh
target market 34 million

sikoba

Use cases

Jump-starting local economies for the world's underbanked

Partial alternatives to micro-credit systems

Business credit networks, to reduce reliance on bank financing

Ad-hoc credit systems in emergency situations

sikoba

Federated blockchain model

Federation members are well-known entities

Members are added or removed from the federation based on a user vote of users

Changes to the economic rules (the software) result from votes of Sikoba federation members, without a need for forks

Federation members will be subject to commitments (data privacy, performance) that are legally binding and/or guaranteed by a good faith deposit

sikoba

Data privacy

In a system like Sikoba, the nodes need to have access to the entire "world state" of all of the users

Accounts are identified only by pseudonymous numbers, linked to external identity services

Users will only have access to their own data

The system will be opaque to non-users

sikoba

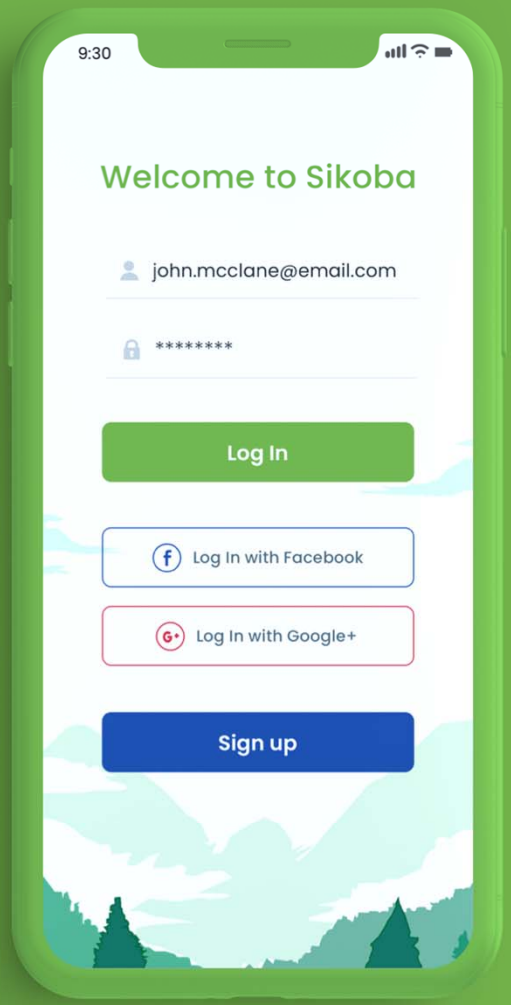
KYC and account recovery

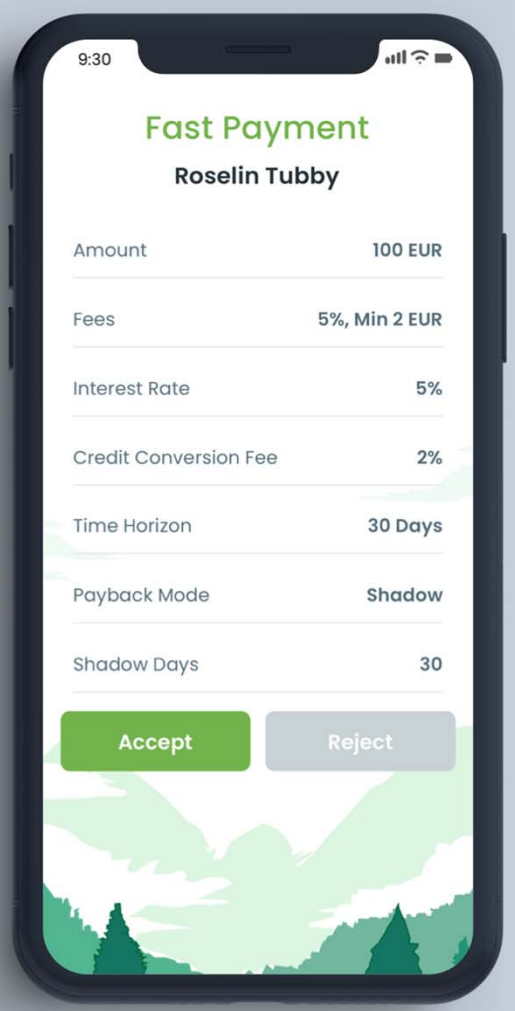
No account recovery possible if the private key is user-managed

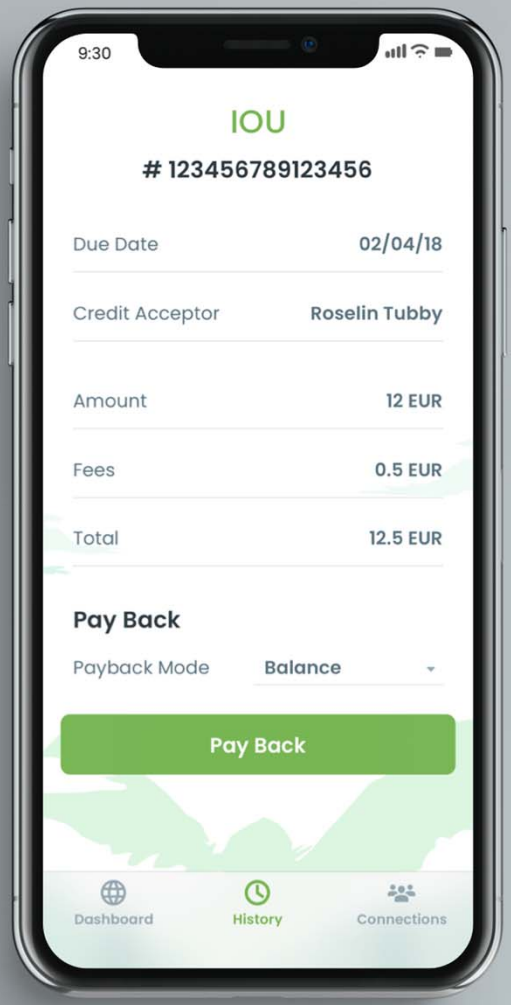
Users who have gone through a KYC process will be able to initiate an account recovery process:

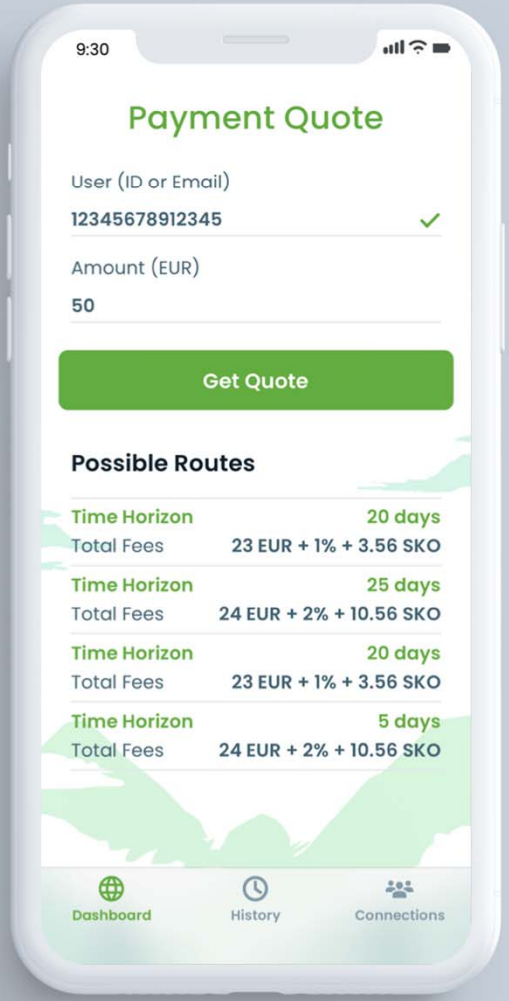
+ the old account is frozen
+ all transactions and account data are copied to a new account

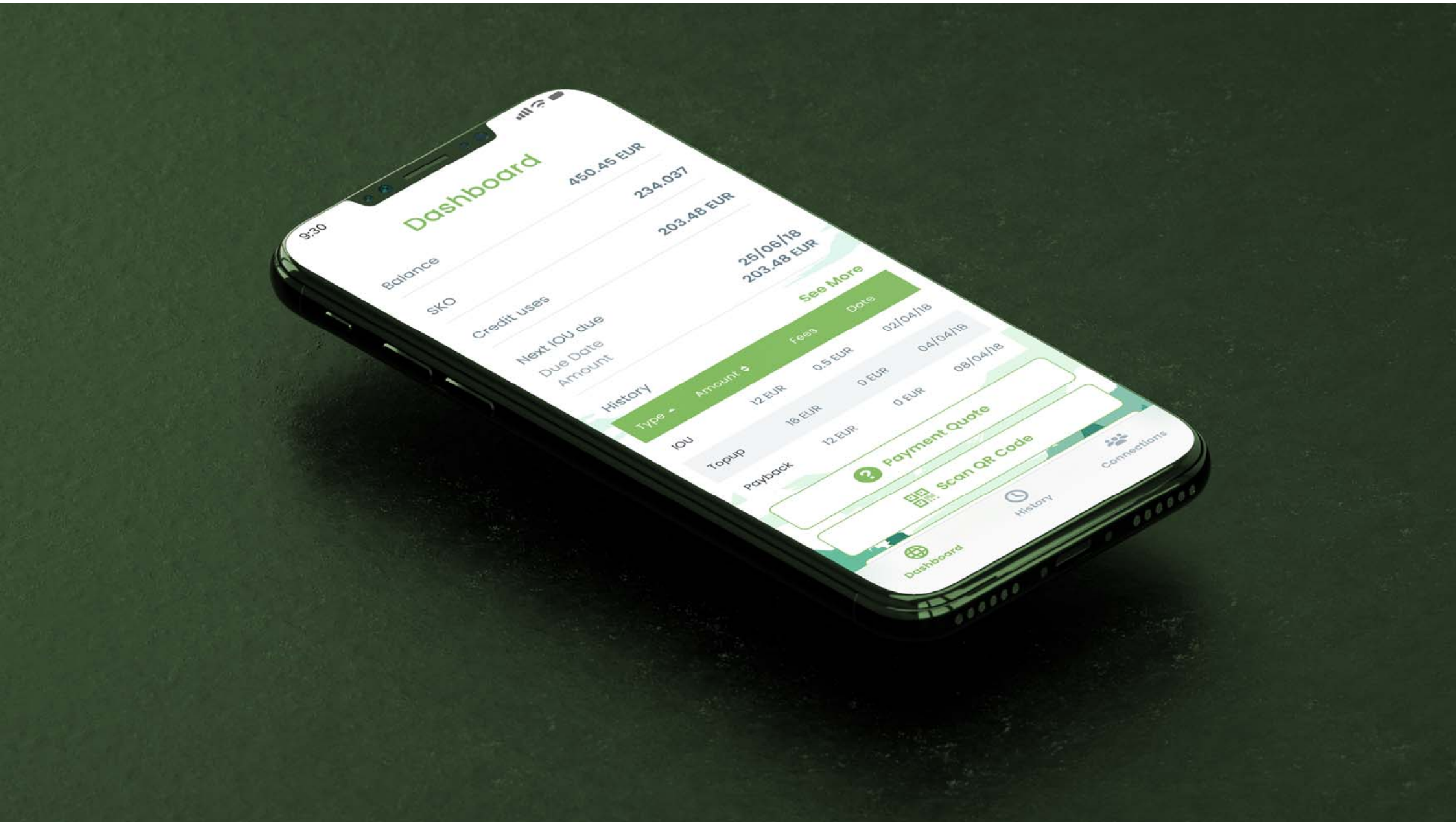
Latest research appears to indicate that speech recognition has the potential to offer the most secure identification method

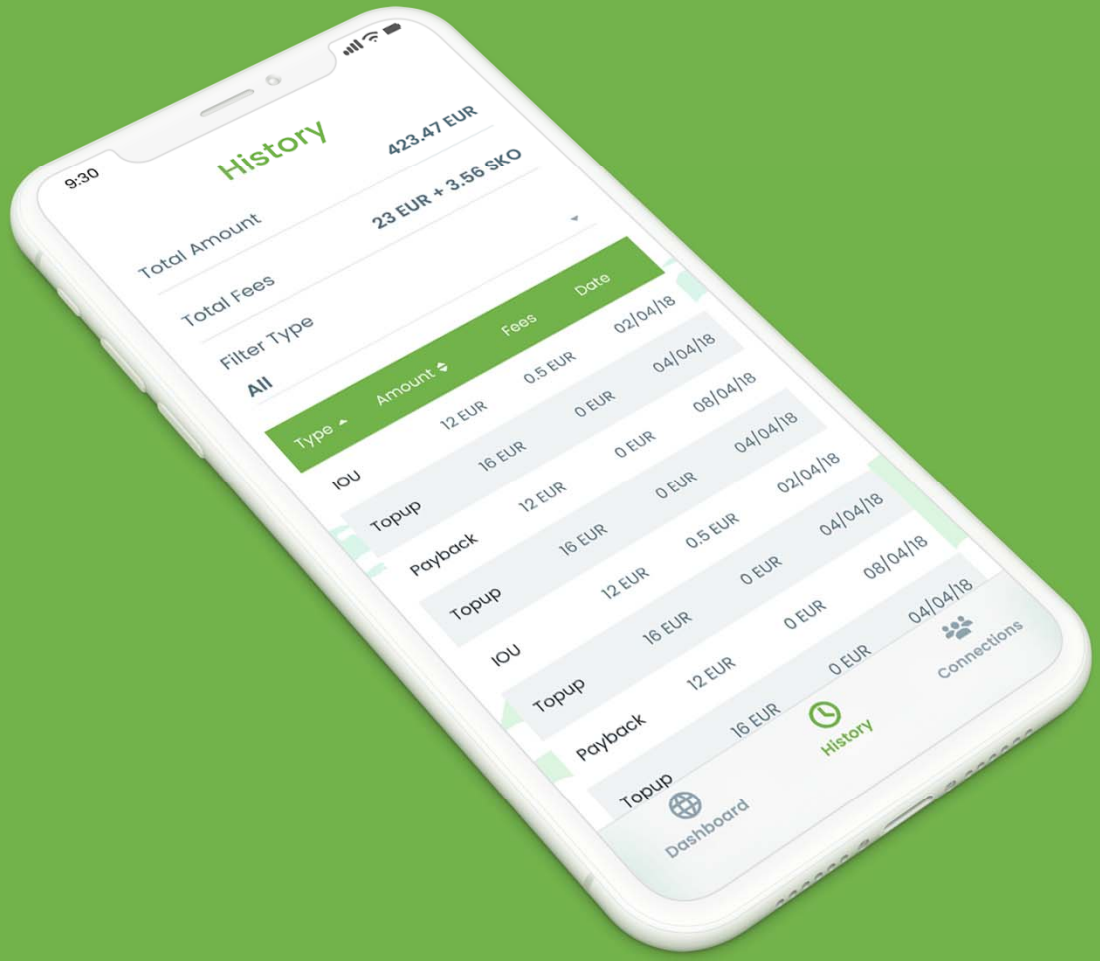

9:30
Welcome to Sikoba
john.mcclane@email.com
****
Log In
Log In with Facebook
Log In with Google+
Sign up


9:30
Fast Payment
Roselin Tubby
Amount
100 EUR
Fees
5%, Min 2 EUR
Interest Rate
5%
Credit Conversion Fee
2%
Time Horizon
30 Days
Payback Mode
Shadow
Shadow Days
30
Accept
Reject


9:30
IOU
123456789123456
Due Date
02/04/18
Credit Acceptor
Roselin Tubby
Amount
12 EUR
Fees
0.5 EUR
Total
12.5 EUR
Pay Back
Payback Mode
Balance
Pay Back
Dashboard
History
Connections


9:30
Payment Quote
User (ID or Email)
12345678912345
Amount (EUR)
50
Get Quote
Possible Routes
Time Horizon 20 days
Total Fees 23 EUR + 1% + 3.56 SKO
Time Horizon 25 days
Total Fees 24 EUR + 2% + 10.56 SKO
Time Horizon 20 days
Total Fees 23 EUR + 1% + 3.56 SKO
Time Horizon 5 days
Total Fees 24 EUR + 2% + 10.56 SKO
Dashboard
History
Connections


9:30
Dashboard
Balance
450.45 EUR
SKO
234.037
Credit uses
203.48 EUR
Next IOU due
25/06/18
Due Date
203.48 EUR
Amount
See More
History
Type
Amount
Fees
Date
IOU
12 EUR
0.5 EUR
02/04/18
Topup
16 EUR
0 EUR
04/04/18
Payback
12 EUR
0 EUR
08/04/18
Payment Quote
Scan QR Code
Connections
History
Dashboard


9:30
History
Total Amount
423.47 EUR
Total Fees
23 EUR + 3.56 SKO
Filter Type
All
Type
Amount
Fees
Date
IOU 12 EUR 0.5 EUR 02/04/18
Topup 16 EUR 0 EUR 04/04/18
Payback 12 EUR 0 EUR 08/04/18
Topup 16 EUR 0 EUR 04/04/18
IOU 12 EUR 0.5 EUR 02/04/18
Topup 16 EUR 0 EUR 04/04/18
Payback 12 EUR 0 EUR 08/04/18
Topup 16 EUR 0 EUR 04/04/18
Dashboard
History
Connections

sikoba

Sikoba s-nodes : our middleware

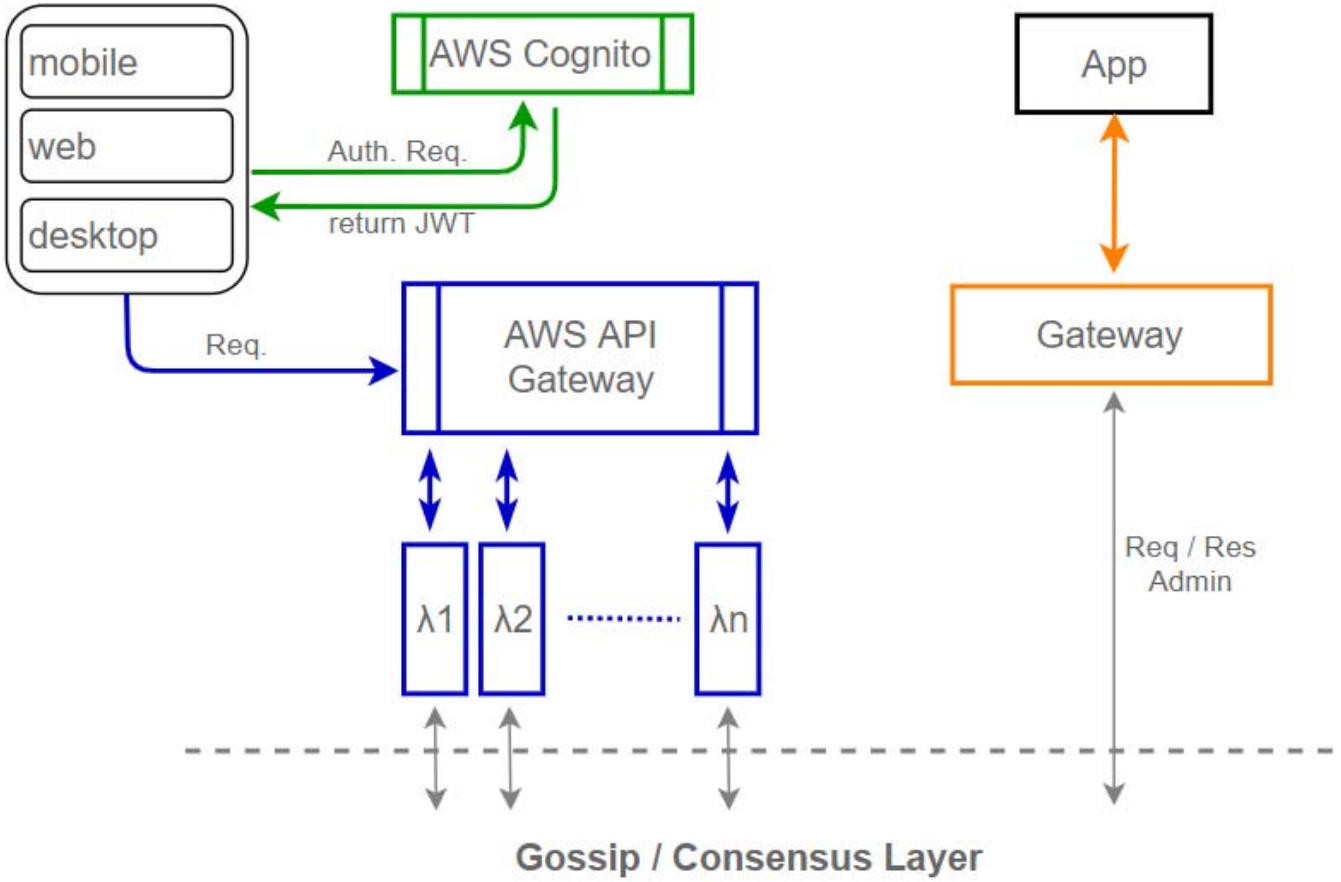
The number of private / consortium blockchain projects is increasing

Market leader Hyperledger is complicated to implement

We like the approach taken by Tendermint and Babble, however we felt the need for additional functionality.

Hence we have started to work on our own consensus layer.

User Access Layer

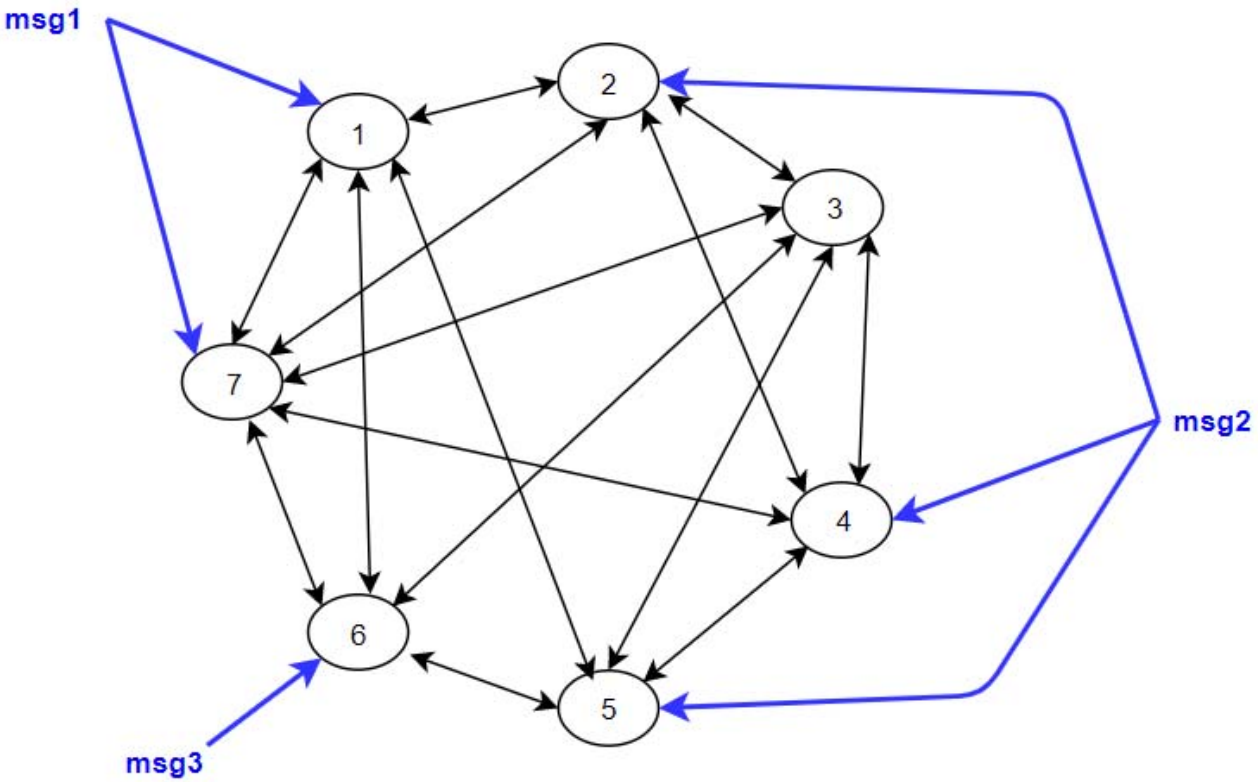


```
{

  "header": {
      "version": "0.1",
      "hashing": "SHA256",
      "signing": "RSA 512",
      "meta": ""
  }

  "envelope": {
      "type": "REQ",
      "target": "http://localhost:8001/message",
      "payload": "TX(bbe7bb5f-9cd3-44c2-8c78-53e1329b1eb1, 73)",
      "attachments": []string,
      "nonce": 1
  },

  "credentials": {
      "uuid": "bbe7bb5f-9cd3-44c2-8c78-53e1329b1eb1"
      "pubkey": ""
      "token": "b5226927a68a3-6f59ccfee6a0f56dec1fdc930cb"
  }

  "hash": "49b035a0ca056b5226927a68a36f59ccfee6a0f56dec1fdc930cbf6232568e87",

  "signature": "",

  "gateway_signature": {
      "g_epoch": 678768,
      "g_pubkey": "0x76ae67",
      "g_signature": "0xa26054c4af851e3a7cfcdf5735d3facde3051bb1016d39b02abdd57003d3bb5b4dd6a6"
  }

}
```

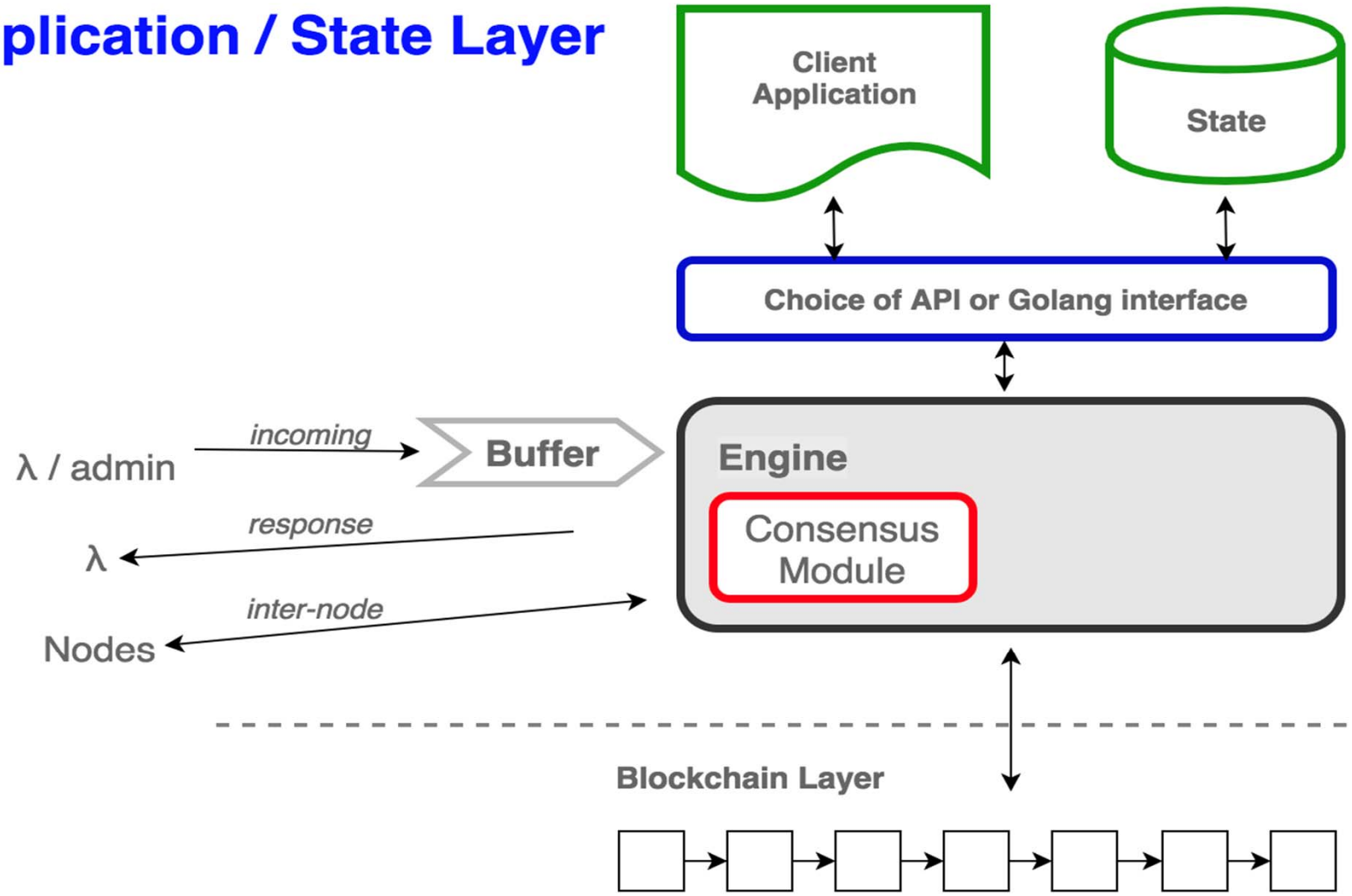
Gossip Layer

Receives messages only from authorised gateways.

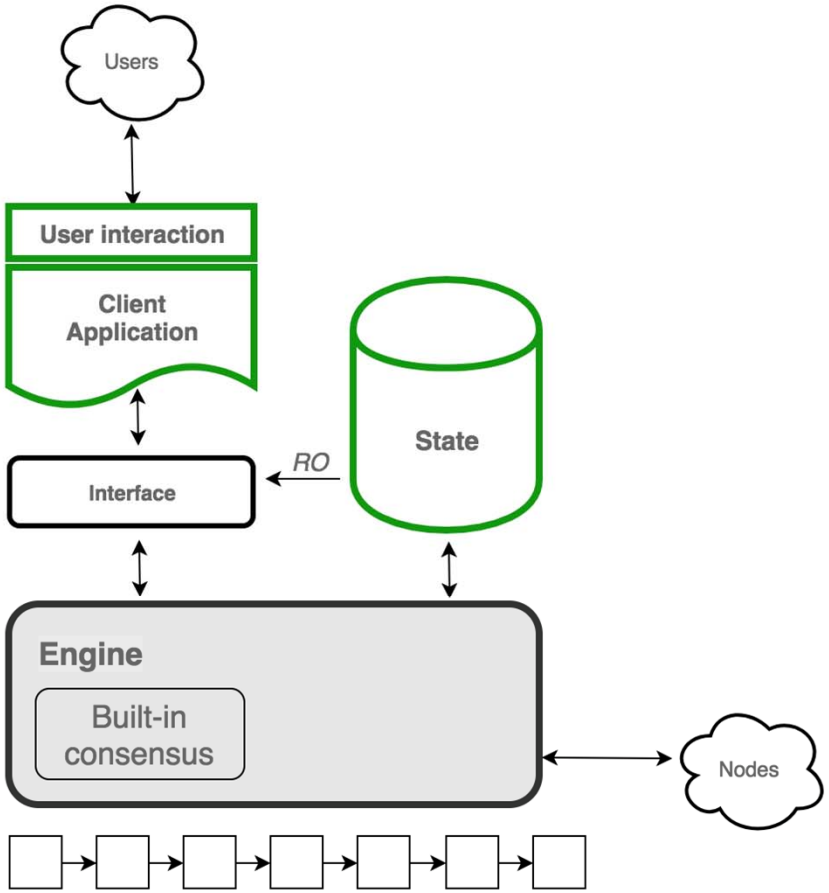
Exchanges information and serves to reach consensus on message order and message batches.

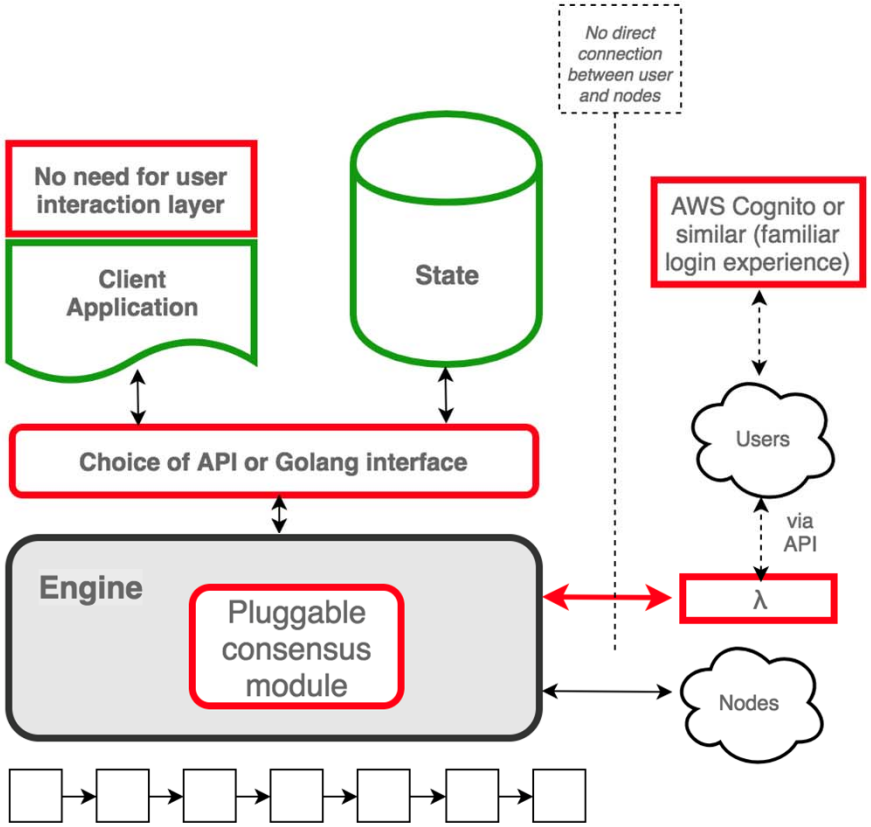


Application / State Layer



Points of difference versus existing architectures





sikoba

Optimisation Consensus Protocol

A consensus protocol that leverages the distributed processing power of the nodes for hard-to-solve optimisation problems.

Every node starts by using a deterministic algorithm that will compute a reasonable solution quickly and yield a "baseline result"

Every node then tries to improve on the baseline result, using a predetermined probabilistic algorithm

After spending a predetermined time, the nodes seek consensus: the optimal solution wins

sikoba

Thank you!

Aleksander (Alex) Kampa

+352 691 46 84 85

Skype: alex.kampa

ak@sikoba.com

http://www.sikoba.com