DLT for cross-border payments

Daniel Szego

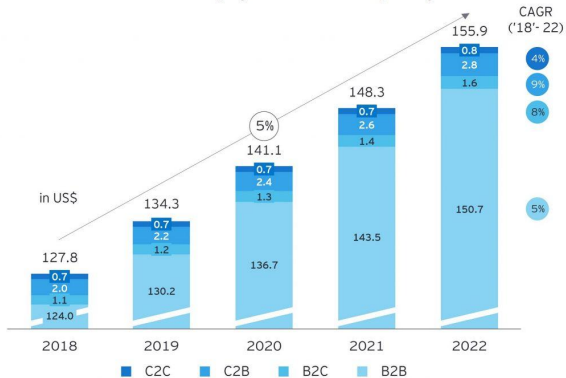In: **https://www.linkedin.com/in/daniel-szego/**

Agenda

- Cross-border payment
- Cross-border payment inefficiencies
- Cross-border payment as interoperability
- Cross-border payment models
- Cross-border payment via correspondent banking
- Wholesale cross-border CBDC projects in the world
- mBridge
- Project Aber
- Project Icebreaker
- Wholesale cross-border CBDC project comparison
- Conclusions and further challenges
- Q&A

Cross-border payment

Cross-border payment use-cases:

- Ecommerce

- Remittances

- International trade

- Travel

- Business payouts

- Trading platforms

- Corporate treasury flows

Global cross-border payments flows split by use

How new entrants are redefining cross-border payments, EY:
https://www.ey.com/en_it/banking-capital-markets/how-new-entrants-are-redefining-cross-border-payments

Cross-border payment inefficiencies

Limited operating hours,
- low speed (up to five days)

Transaction costs and exchange rates,
- high cost (5.39% - 11.69%, average 6.3%)

Limited transparency

Compliance and legal issues

Tax issues

Limited interoperability:
- Infrastructure challenges
- Multiply intermediaries
- Operational complexity

G20 Roadmap for Enhancing Cross-border Payments: Consolidated progress report for 2023:
https://www.fsb.org/2023/10/g20-roadmap-for-enhancing-cross-border-payments-consolidated-progress-report-for-2023/

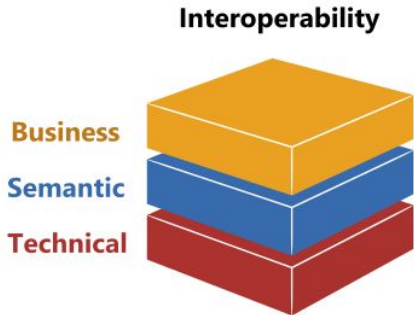# Cross-border payment as interoperability

Technical:
- Same technical infrastructure, e.g. message formats.

Semantic:
- Same interpretation of data and information.

Business:
- Same rights, obligations, doing business, legal compliance, etc …

Interoperability

Business

Semantic

Technical

Interoperability between payment systems across borders (BIS): *https://www.bis.org/publ/bisbull49.htm*

Cross-border payment via correspondent banking

Correspondent banking

Services on behalf of smaller banks

Fund transfer

Settlement

Treasury services / operations

Foreign exchange (FX)

Nostro-vostro accounts

E.g. Eurodollar

Starbucks		JP Morgan NY		Citi NY		Deutsche Bank London	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
-10 JP Morgan NY +10 Deutsche Bank London		-10 reserves	-10 Starbucks	+10 reserves	+10 Deutsche Bank London	+10 Citi NY	+10 Starbucks
						+loans	+deposits

Balance sheet change in and example cross-border payment scenario

Cross-border payment models

Single access point:
- single "gateway" entity
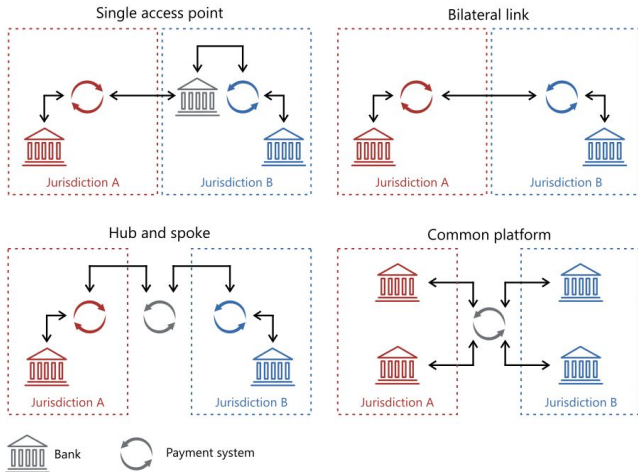- simplicity, scalability problems

Bilateral link:
- bilateral links in foreign systems
- cost effective, complex with several links

Hub and spoke:
- common settlement agent (hub)
- cost varies on the number of participants

Common platform:
- common payment system
- most complex

Single access point

Bilateral link

Hub and spoke

Common platform

Jurisdiction A   Jurisdiction B

Bank   Payment system

Interoperability between payment systems across borders (BIS): *https://www.bis.org/publ/bisbull49.htm*

Wholesale cross-border CBDC projects in the world

mBridge project

Project Dunbar

Project Aber

Project Jasper

Project Jura

Project Stella

JPMorgan Onyx*

Project Icebreaker*

Project Mariana*

HYPERLEDGER
BESU

HYPERLEDGER
CACTI

HYPERLEDGER
FABRIC

HYPERLEDGER
FIREFLY

HYPERLEDGER
IROHA

Norges Bank
ECB Digital Euro
Project Venus: France & Luxembourg
Banque de France
Iberpay Smart Money
Project Mariana: France, Switzerland,
Singapore, & BIS
China BSN integration
Project Stella: Japan & ECB
Eastern Caribbean
Central Bank DCash
Project Aber: Saudi
Arabia, U.A.E.
Bank of India
Project Inthanon & ILR2 : Bank of
Thailand & HKMA
Bank of Nigeria
e-Naira
Project Bakong: Bank of
Cambodia
Project Agila: Philippines
Banco Central do Brasil
Drex
Global MAS
CBDC Challenge
Reserve Bank of Australia

Hyperledger in Action
https://www.linuxfoundation.org/hubfs/Hyperledger_CBDC%20ebook_V2.pdf

mBridge

Wholesale cross-border CBDC

Funding banks: China, Hong Kong, Thailand and the UAE + 25 observing members
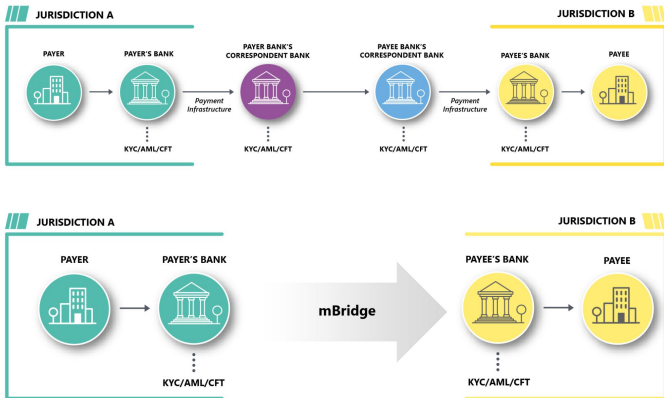
Further developed *Hyperledger Besu*

PvP payment versus payment use-cases

Liquidity saving and FX exchange

Advanced privacy concepts

ISO 20022 compliant API-s

**Report:** *https://www.bis.org/about/bisih/topics/cbdc/mcbdc_bridge.htm*

Project Aber

Wholesale cross-border CBDC

Funding banks: Saudi Arabia, U.A.E

Hyperledger Fabric

use-cases:
- cross-border settlement between central banks
- domestic settlement between commercial banks
- cross-border settlement between commercial banks
- dual currency system
- DvP delivery versus payment investigations
- RTGS integration

Report: *https://www.centralbank.ae/media/cbshgsmf/aber-report-2020-en.pdf*
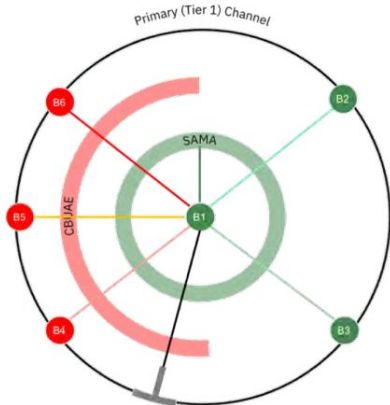
Project Icebreaker

Retail CBDC payment project

The Bank for International Settlements (BIS), central banks of Israel, Norway and Sweden.

Interlink domestic payment systems, domestic rCBDC experimental systems:
- Quorum (Israel)
- Hyperledger Besu (Norway)
- R3 Corda (Sweden)

Hub and spoke model with HTLC and atomic swaps

Bridge currency, FX

Link: *https://www.bis.org/about/bisih/topics/cbdc/icebreaker.htm*
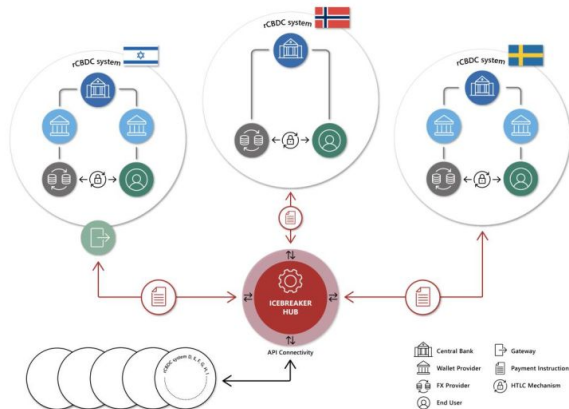
Wholesale cross-border CBDC project comparison

Correspondent banking	mBridge*	Dunbar	Jura**	BdF-MAS	Jasper-Ubin	Aber	Stella	Icebreaker
Transaction transparency	Insufficient	Transparent	Transparent	Transparent	Transparent	Transparent	Transparent	N/A	segmented
Operating hours	Limited	24/7	N/A	24/7	24/7	24/7	even 24/7	N/A	24/7
Interoperability	Limited	High	High	High	High	Questionable	High	High	High
Transaction costs	High	Lower	Lower	Lower	Lower	Lower	Lower	N/A	N/A
Infrastructure challenges	Significant	Moderate	Moderate	N/A (Delegation, oversight, legal changes)	N/A	Lower	Moderate	Moderate	Moderate
Payment model	Varies	Common platform	Common platform	Common platform	Common platform	bilateral	Common platform	Varies	Hub and spoke

Conclusions and further challenges

DLT based cross border payments solve many inefficiencies of the classical payment systems:

- Cross border wholesale or retail CBDC, tokenized deposits in cross-border use-cases

- Near real-time cross-border payment

- 50-80% reduction in transaction costs

- 24/7 operating hours

- Direct interbank payment without intermediaries

- Eliminating data fragmentation problems

- Automated FX by smart contracts

Challenges still remaining to be solved:

- DLT technical challenges, untypical DLT use-cases

- Governance was usually out of scope

- Different regulatory compliance based on multiple jurisdiction.

- Different onboarding, KYC, AML processes

- DLT privacy issues

- DLT scalability questions

- On-chain exchange challenges, challenges of liquidity pool based DEX-s, like locked liquidity

Q & A

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