

# **Blockchain technology in the financial system**

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# The irony implicit in today's session

- Bitcoin's genesis block  
January 3, 2009



- “The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust.”

Satoshi Nakamoto,  
February 11, 2009

# Where we are ten years after Bitcon



Yogita Khatri

🕒 May 7, 2019 at 12:00 UTC

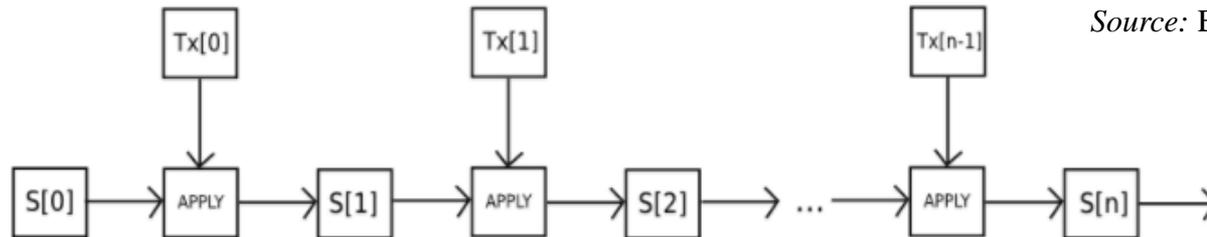
The Bank of Thailand, the country's central bank, has moved ahead with its digital currency project by building a blockchain-based prototype solution.

The solution will enable the central bank to settle interbank transactions using a digital currency among its eight commercial bank partners. BoT's tech partner Wipro [announced](#) the news on Tuesday.

They built the prototype as part of the central bank's digital currency project, called Inthanon. Wipro and blockchain enterprise software firm R3 on Corda platform provided development services.

The solution will enable decentralized interbank real-time gross settlement (RTGS) using a wholesale Central Bank Digital Currency (CBDC) for faster payments, Wipro said, adding:

# Logic of a blockchain



Source: Ethereum white paper

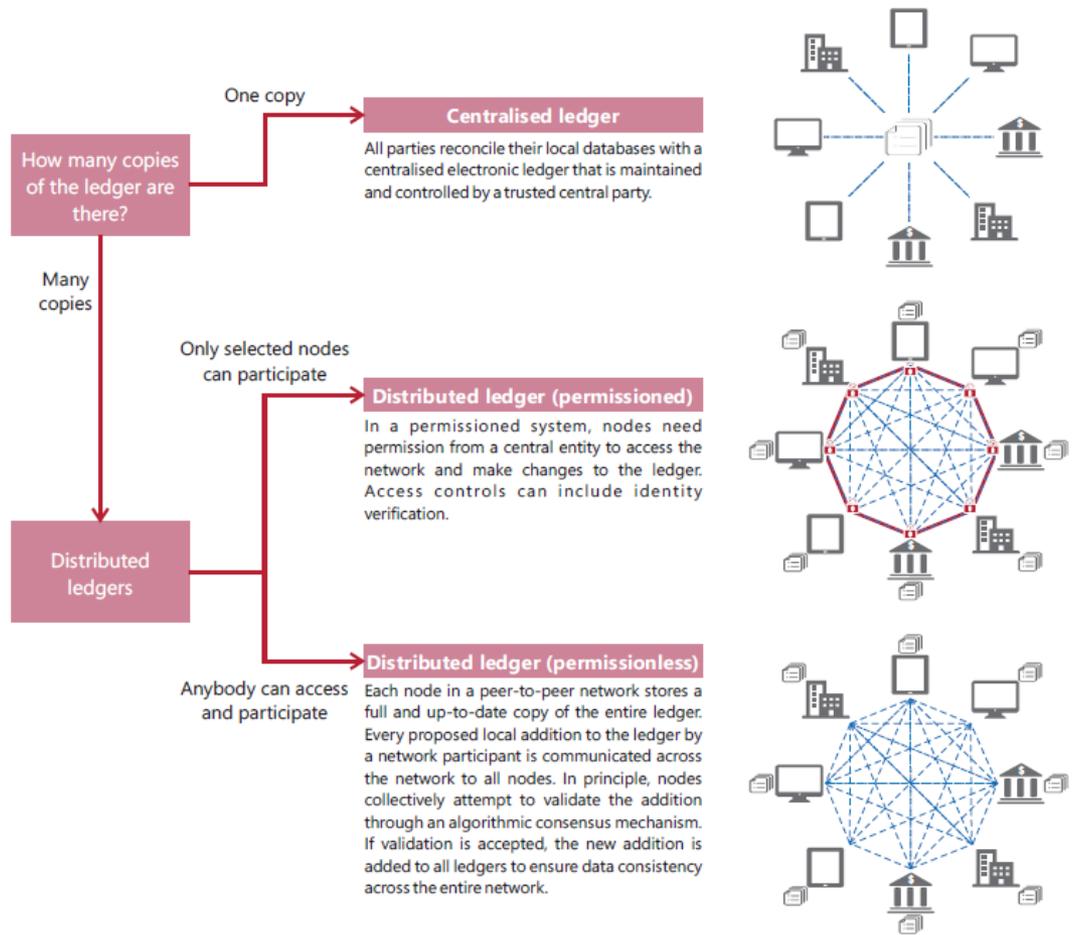
- Each transaction  $n$  is *encrypted* into  $Tx(n)$ .
- Each new block  $n$  includes:
  - The new transaction,  $Tx(n)$
  - An encryption of the previous block,  $S(n - 1)$ .
- Two implications of this structure:
  - Even if  $Tx(1) = Tx(2)$ , we will have  $S(1) \neq S(2)$ , making it impossible to recover the raw data
  - If  $Tx(n)$  is changed, **every block  $n, n+1, n+2, \dots$ , will also change**



# Problems with open blockchains make them infeasible for industry

- No customer privacy / confidentiality
  - Marketing problem
  - Compliance problem
- Cost of mining
- Spontaneous forks arising due to network latency
  - Probabilistic confirmation of transactions
- Hard forks arising due to disagreements
  - Potential for schisms and instability

# Permissioned ledgers



# Cognitive dissonance at JPMorgan



“Bitcoin is a fraud. It’s just not a real thing, eventually it will be closed. It’s worse than tulip bulbs. It will not end well. Somebody is going to get killed.”



## Blockchain and the decentralization revolution

A CFO's guide to the potential implications of distributed ledger technology

J.P.Morgan

# Interbank settlement schemes

## USC: Utility Settlement Coin

Create a universal token to exchange liquidity globally between financial counterparts, backed by fiat funds held in central bank accounts (sort of "pseudo-central bank").



THE WALL STREET JOURNAL  
WSJ.com

September 3, 2015, 1:33 PM ET

## UBS Building Virtual Coin For Mainstream Banking

By Anna Ibrera



The logo of Swiss bank UBS is seen at its headquarters Zurich.

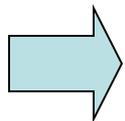
Swiss bank UBS is working on a prototype virtual currency that it hopes will be used by banks and financial institutions as a basis to settle mainstream financial markets transactions. But unlike the bitcoin digital currency, the Swiss bank's proposed "utility settlement coin," would be linked to real-world currencies and central bank accounts. The virtual coin would be used to power transactions on institutional financial platforms built on blockchain technology, similar to the distributed, peer-reviewed online ledger which currently powers bitcoin. For instance, UBS might have its own blockchain-based platform to issue bonds, and another bank might have a blockchain-based stock trading platform, but both would use the same utility coin for settlement. Distributed ledgers such as the blockchain enable ownership of assets to be verified by a network of computers on the Internet rather than a centralized authority. The first use of digital ledgers was to create bitcoin, the virtual currency linked to money-laundering and online drugs markets, but also increasingly to a growing number of legitimate businesses and new financial services startups around the world. Over the

Sources: <https://www.slideshare.net/FI-WARE/fiware-tech-summit-alastria-towards-economy-40>  
<https://blogs.wsj.com/digits/2015/09/03/ubs-building-virtual-coin-for-mainstream-banking/>

# How large could the savings be?

“Clearing, settling and managing post-trade processes costs between \$65 billion and \$80 billion a year globally, according to consultancy Oliver Wyman.

“In a joint study with the venture arm of Spanish bank Santander, the consultancy estimated that blockchain technology could reduce the bank’s infrastructure costs in cross-border payments, securities trading and regulatory compliance by as much as \$20 billion a year by 2022.”



Implies **25% to 30% operating cost reduction**

# Trade finance

