

# The DLT Reference Model and 7 DLT Classes

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## OBJECTIVE

Support **Consistent DLT Analysis**

1 DLT Use-Case Solution Fit Analysis

2 Identify Understudied DLT Designs

## FIRST PRINCIPLES

DLT's **LEDGER**  
(READING)

DLT's **CONSENSUS**  
(ORDERING, WRITING)

DLT's **NETWORK**  
(LIMITING)

## MODEL

Design Component:  
**LEDGER**

DATA STRUCTURE: DAG/Convergent

...

Design Component:  
**CONSENSUS**

ACTION 1: ORDERING: 2 options

ACTION 2: WRITING: 3 options

Design Component:  
**NETWORK**

Consensus Network (CxN): 2 options

Transacting Network (TxN): 2 options

### Design Space

LEDGER  
OPTIONS  
(collapsed)

NETWORK OPTIONS  
 $2 \times 2 - 1 = 3$   
(CxN, TxN)

CONSENSUS  
OPTIONS  
 $2 \times 3 = 6$   
(ORDER, WRITE)

1	X	X
2	3	4
X	5	X
X	X	X
X	X	6
X	X	7

### Trust-Aspects

- Payment Tx (Trust-less Tx)  
Anonymous & Unilateral Tx
- Obligations  
(Trusted Tx)
- Multilateral Tx & No Gas  
Smart Contracts
- Immediate or  
Deterministic Finality
- No Mining  
Efficient Native Asset
- Asset Level  
Provenance
- Consortium  
Issued Assets
- Tx Tear-Offs  
& Ledger Privacy

### Functional Space Classes

Each Functional DLT Class has a unique  
**Trust-Aspect** set (**FINGERPRINT**)

Bitcoin	1					
Ethereum 1.0						
Ethereum 2.0	2					
Polkadot						
Ripple XPR	3					
Hadera HBAR						
Pokadot Based	4					
Hybrid, Quorum						
Project Hamilton <sup>1</sup>	5*					
Hyperledger Fabric	6					
R3 Corda	7*					

<sup>1</sup>Project Hamilton  
MIT & Federal Reserve  
Bank of Boston 2020

\* Locked to  
Asset Level  
Provenance

Design Space :: Functional Space

## FINDINGS

1

### Trust-Aspects for DLTs

cannot be optimized for both  
**Obligations** (Trusted-Tx) and  
**Payments** (Trust-less-Tx)

2

### Multilateral-Notary DLTs

provide maximal Trust-Aspects for  
**Obligations** (Trusted-Tx)

Of 23 DLTs Reviewed, only **one** is Notary-Multilateral (Class 7)  
only **two** are Notary DLTs (Class 5 & 7)

3

### Bottom-Up DLT Framework

provides design **boundaries**  
for DLT **evolution**

mitacs

Innovation  
Boost Zone

Supporters

Toronto  
Metropolitan  
University

Affiliations

OpenSailAssets

Connect on  
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