



HONG KONG MONETARY AUTHORITY
香港金融管理局



PROJECT ENSEMBLE

Project Ensemble

Taxonomy



Purpose of the Taxonomy

As part of Project Ensemble, the Hong Kong Monetary Authority (HKMA), has developed a shared taxonomy of digital finance terms. Its aim is to establish a common understanding of key concepts within the evolving digital finance ecosystem, supporting the HKMA's work on interoperability standards for Hong Kong.

By providing clear, consistent definitions, the taxonomy enables practitioners, policymakers, and the public to engage more effectively in discussions, foster cross-sector collaboration, and promote the transparent, inclusive development of Hong Kong's tokenisation ecosystem. This document is not a legal reference and contains no legally binding definitions. It is intended solely for information and discussion, reflecting the collective perspectives of contributors.

Disclaimer

This taxonomy does not provide legal advice, define regulatory obligations, or offer formal interpretations of laws. Readers should consult relevant regulatory or legal authorities for official definitions and requirements.

Acknowledgements

This is a joint report developed by the HKMA, the Architecture Community (AC) and industry participants. The report was led by the HKMA, in collaboration with Euroclear, with support and contribution from Securities and Futures Commission.

The HKMA thanks all organisations and individuals who contributed to this taxonomy.

Special thanks to those directly involved in drafting and revising:

- **Ant Digital Technologies**
- **Hong Kong and Shanghai Banking Corporation (HSBC)**
- **King & Wood**
- **R3**

The HKMA also appreciates the feedback from:

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|---|---|
| • Chainlink | • King's College London |
| • Clifford Chance | • Oliver Wyman |
| • Digital Asset Holdings | • SWIFT |
| • Duke University | • University of Cambridge, Judge Business School |
| • Global Blockchain Business Council | |

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Atomicity (of DLT systems)	Atomicity refers to a series of operations that are executed as a single, indivisible unit. This means these operations must either be all executed completely ('all complete') or none of them are executed or completed at all ('none complete').	Digital Asset Token Interoperability Instant Payment Interoperability Mechanisms Smart Contract
Blockchain	Blockchain is a type of distributed ledger technology (DLT) that records cryptographically secured transactions in tamper-resistant blocks. These blocks are linked in a sequential chain and replicated across a decentralised peer-to-peer network, enabling simultaneous access, validation, and recording of data.	DLT Off-chain On-chain Layer 1 Layer 2 Node Virtual Machine
Bridge	A bridge is a specialised protocol or system that enables interoperability between different DLT networks and decentralised applications (dApps) by facilitating the secure transfer of data, tokens, or other digital assets. It ensures consistent synchronisation across ledgers, preventing duplication or double-spending.	Interoperability DLT Token Digital Asset Decentralised Application (dApp)
Burn	Burning is the process of decreasing the total amount of digital assets or tokens in circulation on a DLT network. In practice, burning can be achieved on a permissionless DLT network by sending a token to a wallet for which there is no known private key (commonly referred to as a 'burn address').	Mint Token Digital Asset

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Central Bank Digital Currency (CBDC)	A CBDC is a digital form of central bank money, issued in digital native or digital twin form. Like other forms of central bank money, CBDC is a direct liability of the issuing central bank and is denominated in the domestic unit of account. CBDCs can be designed for retail use, comparable to physical notes and coins, or for wholesale use between financial institutions, similar to existing bank reserves held at central banks in Real Time Gross Settlement (RTGS) systems.	Digital Money
Composability	Composability is the ability to create complex digital assets, processes, tools or applications by combining modular, interoperable components without redesigning or duplicating existing functionality.	Digital Asset DLT
Consensus Mechanism	A consensus mechanism is the set of rules and protocols that allow nodes in a DLT network to validate and agree on updates to the ledger, ensuring consistency, integrity, and resistance to unauthorised modifications.	Node DLT DLT Network
Decentralised Application (dApp)	A decentralised application (dApp) is a software application that operates on a DLT network, typically through the use of smart contracts. A dApp is designed to function without reliance on a central authority, enabling direct user interaction and transparent, verifiable operations on the DLT network.	DLT Network Smart Contract

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Decentralised Finance (DeFi)	Decentralised finance (DeFi) refers to financial services and products that are provided through decentralised applications (dApps) operating on DLT networks. DeFi enables users to access, transfer, and manage digital assets and financial arrangements without reliance on traditional intermediaries or central authorities.	DLT Network Smart Contract Decentralised Application (dApp)
Digital Asset	A digital asset is an asset on a DLT network that is in digital native or digital twin form. Regulatory classification of a digital asset (e.g., as a virtual asset, payment instrument, security or other financial product etc.) depends on its specific characteristics.	Digital Asset Custodian Bridge Wallet RWA Fungible Token NFT
Digital Asset Custodian	A digital asset custodian safekeeps digital assets on behalf of its clients and may be subject to regulation depending on its activities scope of services and arrangements with clients. A digital asset custodian can provide additional services such as wallet and interface, transfer capability, and links to other wallets and decentralised finance (DeFi) services. Its role is critical in helping prevent theft, loss, or unauthorised access to digital assets.	Wallet Digital Asset
Digital Asset Securities	Digital asset securities are securities (such as funds, bonds, notes or interests in a collective investment scheme) in digital native or digital twin form.	DLT Off-chain On-chain Tokenisation

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Digital Identity	Digital identity is the digital representation of an individual's or entity's identity. It is made up of information used to identify and authenticate an individual or entity.	
Digital Money	Digital money is money represented and transferred in digital form that can serve as a medium of exchange, store of value and unit of account. CBDCs, and tokenised deposits are examples of digital money.	DLT CBDC Tokenised Deposits
Digital Native	Digital native refers to any value that is issued on a DLT network, which serves as the primary, original and authoritative record of the value it represents.	DLT Digital Asset Digital Money Token
Digital Twin	A digital twin is a type of digital asset that is a digital representation or virtual model of a real-world asset.	Digital Asset Real-World Asset

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Distributed Ledger Technology (DLT)	Distributed Ledger Technology (DLT) is the technology that enables decentralised digital infrastructure or systems to securely record and synchronise updates to the ledger across a network of participants using consensus mechanisms.	Blockchain Consensus Mechanism Wallet
DLT Network	A DLT network is a system of interconnected nodes which uses Distributed Ledger Technology (DLT) to collectively maintain, validate, and synchronise a shared ledger. Each node may store a full or partial copy of the ledger, participate in consensus mechanisms, and contribute to the system's integrity, security and resilience. DLT networks can be private or public, permissioned or permissionless.	Node DLT Consensus Mechanism Interoperability Permissioned DLT Network Permissionless DLT Network Off-chain On-chain Oracle
e-HKD	The Hong Kong Dollar (HKD)-denominated CBDC which can potentially be used in retail and wholesale scenarios by financial institutions, corporates, and individuals.	CBDC Digital Money
Fungible Token	A fungible token is a token that is interchangeable with, and indistinguishable from, and homogeneous to other tokens of the same type, which means that one can be freely substituted for another.	Token Stablecoin Digital Money Tokenised Deposit

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Instant Payment	Instant payment means the immediate or near-real-time transfer of value with technical finality between parties. Instant payments can be facilitated through DLT or traditional payment infrastructures.	Atomicity Digital Asset Token
Interoperability	Interoperability is a characteristic of an application or system that allows it to work with other products or systems. Interoperability, in a DLT context, is the technical, operational and legal capability that enables seamless interactions—such as tokens, digital assets, data, value, or communications—between different DLT networks, or between DLT networks and non-DLT systems.	Interoperability Mechanism Digital Asset Token DLT Network
Interoperability Mechanism	Interoperability mechanisms enable the transfer of tokens, digital assets, data, or value between different DLT networks or between DLT networks and non-DLT systems. Several implementation methods exist, such as application programming interfaces (APIs), cross-chain facilities or protocols (e.g., relayer and HTLC). A Hashed TimeLock Contract (HTLC) is a smart contract that facilitates conditional payments by combining a hashlock and a timelock to ensure that funds are released only after certain conditions are met. Interoperability mechanisms can help reduce potential fragmentation across networks and enhance connectivity.	Interoperability Token Digital Asset Blockchain DLT Network Smart Contract Bridge
Layer 1	Layer 1 refers to the foundational blockchain networks that governs the core operations of a DLT network, including transaction validation, consensus mechanisms, and network security.	Blockchain DLT Consensus Mechanism Layer 2 Virtual Machine

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Layer 2	Layer 2 refers to secondary blockchain networks or frameworks built on top of Layer 1 to enhance scalability, transaction speed, and functionality as well as to introduce capabilities such as permissioning, privacy and know-your-customer (KYC) checks. Layer 2 solutions execute transactions off Layer 1 and subsequently anchor data back to Layer 1 for security and technical finality.	Blockchain DLT DLT Network Layer 1 Virtual Machine
Mint	Minting is the process of creating new or additional digital assets or tokens by adding them to a DLT network, thereby increasing the total amount in circulation.	Burn Token Digital Asset
Node (DLT)	A node is a device that participates in a DLT network by storing a full or partial copy of the ledger, validating transactions, participating in consensus mechanisms, or serving as a communication endpoint. Nodes are essential for maintaining the integrity, transparency, and security of the DLT network.	DLT DLT Network Blockchain Consensus Mechanism Virtual Machine
Non-Fungible Token (NFT)	An NFT is a token that is uniquely identifiable and is not fungible with any other token.	Token

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Off-chain	Off-chain refers to data processing or computations that are external to, but nevertheless relate to, a blockchain or DLT network. Results of any such processing or computation may later be anchored or reconciled on-chain.	Blockchain DLT Network Consensus Mechanism
On-chain	On-chain refers to operations that are executed and recorded directly and permanently on a blockchain or other DLT network.	Blockchain DLT Network Consensus Mechanism
Oracle	An oracle is a service that connects DLT networks to off-chain data sources (such as external databases), thereby enabling smart contracts to access, retrieve and act upon real-world information.	DLT network Smart Contract Interoperability Bridge Off-chain On-chain
Permissioned DLT Network	A permissioned DLT network restricts access and roles to approved participants. Permissions govern who can read, write, or validate transactions or participate in governance and regulatory compliance-related matters. A permissioned DLT network may have different access controls: Private-permissioned: Access is limited to a closed group of approved participants; or Public-permissioned: Anyone can access the network, but only approved participants can perform specific roles such as validation or participation in consensus mechanisms.	DLT network Permissionless DLT Network

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Permissioning	Permissioning, in a DLT context, refers to the process of managing the identities, access rights, and privileges of participants within a DLT network. Permissioning ensures that only approved participants can interact with designated parts of the network, thereby upholding governance, security, and operational integrity.	DLT Network
Permissionless DLT Network	A permissionless DLT network is an open and decentralised system where anyone can connect, access data, and participate in transaction validation without prior authorisation or restrictions on roles and responsibilities. A permissionless DLT network is by its nature public and is therefore also referred to as a public permissionless DLT network.	DLT network Permissioned DLT Network
Privacy-Enhancing Technologies (PETs)	Privacy-enhancing technologies (PETs) are a suite of tools, techniques, and protocols designed to protect personal and sensitive data throughout the data lifecycle—during collection, processing, storage, and sharing. PETs allow DLT networks to protect sensitive data while maintaining transparency and trust, thus enabling secure collaboration and computation by minimizing data exposure and maximizing user control. Examples of PETs currently include zero-knowledge proofs, secure multiparty computation, and homomorphic encryption.	DLT network
Private Key	A private key is a cryptographic value in an asymmetric key pair (being a pair of mathematically linked keys consisting of a public key for encryption and a private key for decryption) that is kept secret. A private key allows its holder to generate digital signatures, authorise transactions, and prove control of the corresponding public key.	DLT Digital Asset Public Key Wallet

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Programmable Token	A programmable token is a token whose behaviour is governed by embedded logic or rules. Programmable tokens can autonomously execute predefined actions based on specific triggers or events.	Token
Proof of Reserve	Proof of reserve is a verification method used to publicly demonstrate whether off-chain assets are sufficient to cover on-chain liabilities.	Off-chain On-chain
Public Key	A public key is a cryptographic value in an asymmetric key pair (being a pair of mathematically linked keys consisting of a public key for encryption and a private key for decryption) that can be openly shared. A public key allows others to verify digital signatures created with the corresponding private key and to encrypt data that only the holder of the private key can decrypt.	Private Key Wallet DLT Digital Asset
Real-World Asset (RWA)	A real world-asset (RWA) is a financial or non-financial asset that originates outside of a DLT network. RWA can be represented digitally on a DLT network (in digital twin form) through the tokenisation process.	Tokenisation On-chain Off-chain Native Token

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Smart Contract	A smart contract is a computer program or code deployed on a DLT network that automatically executes predefined instructions or conditions when triggered.	Interoperability Mechanism Oracle DLT network
Stablecoin	A stablecoin is a privately-issued, money-like, cryptographically-secured token which purports to maintain a stable value with reference to: (i) a single asset (such as fiat currency) or (ii) a pool or basket of assets.	Digital Money Fungible Token
Token	A token, in a DLT context, is a digital representation of value, ownership, or rights that is created and recorded on a DLT network. Tokens may be fungible (interchangeable) or non-fungible (unique).	Fungible Token NFT
Tokenisation	Tokenisation is the process of creating digital twin or digital native tokens that represent ownership or rights in real-world assets or value. These tokens are compatible with, recorded on, and transferrable via a DLT network.	Token DLT Digital Twin Digital Native

Term	Ensemble Taxonomy Definition	Properties / Linked Terms
Tokenisation Agent	A tokenisation agent is the person or entity responsible for carrying out the tokenisation process, including verifying assets, issuing tokens, and maintaining records and controls in line with applicable governance and compliance requirements.	Tokenisation
Tokenised Deposit	A tokenised deposit is commercial bank money (i.e., commercial bank deposit liability) in digital twin form. A tokenised deposit is backed at all times on a one-to-one basis by corresponding off-chain commercial bank money.	Digital Twin Blockchain
Virtual Machine (VM)	A Virtual Machine (VM), in a DLT context, is a computational environment that executes smart contracts and manages state transitions (which may ultimately lead to ledger updates) in a deterministic and secure manner. It provides a standardised framework and runtime for decentralised applications (dApps), enabling consistent behaviour among nodes and compatibility across Layer 1 and Layer 2 networks.	Smart Contract Layer 1 Layer 2 Interoperability Blockchain Node Decentralised Application (dApp)
Wallet	A wallet is an application or device that securely stores the cryptographic keys (being the public key and the private key) required to authorise transactions on a DLT network. A wallet thus allows users to hold, access and transact with digital assets.	Digital Asset Custodian Digital Asset DLT Public Key Private Key