Blockchain Technology High-Level Knowledge

This short consultation paper provides the information needed to work with blockchain technology from a high-level knowledge understanding and gives the reader an information structure that supports the fundamental baseline topics when looking at blockchain technology from a high-level knowledge understanding.

Blockchain technology in principle is technology innovation that is of services to database requirements and upgrades for connecting individuals without the need for a third party to authorise and validate input and output, and blockchain technology from a high-level is basically the formation of distributed computing and decentralised participation in the maintenance of individual computing network integrity.

Blockchain technology can be understood as technology that is without central databases and remains credibly neutral to the input and output of information that is stored on the blockchain, while supporting participation from anyone with access to the network with permissionless transaction executions that are authenticated with unique data-sets linked with cryptography and mathematical security through mining and validation consensus mechanisms.

Blockchain technology is from a high-level, a computer network, generated by nodes who have downloaded software and run the code base, to act and connect as peers on the network, with other computers who have followed the same procedure. Once the network has begun to form, connected peers on the network can operate as miners or validators to secure the state of the blockchain. There is a reward for this process, and computation is needed to spin the algorithm and reach consensus. The miners and validators are connected to other peers on the network, and they share the state of the network between them. This in return, creates a formal architecture of decentralised computation. The blockchain becomes after infancy an interconnected diverse and transparent, rhizomatic and autopoietic ecosystem.

- *Rhizomatic – non-hierarchal, stemming laterally like roots.*

- *Autopoietic – systematic reproduction and maintenance.*

The natural ecosystem that is created with blockchain technology comes with a variety of instances that can be consumed and operational. Natively, blockchains are about sending transactions and validating and securing data, with innovation in being decentralised and permissionless to transact. Blockchains are fundamentally programmable and the software acts as law in code for how the networks operate. Some blockchains are able to send digital assets, other blockchains are used for applications, and other blockchains are used just for storage. The software code determines what is enabled with the live networks, as the law works in society.

Understanding blockchain technologies at a high level is about the acknowledgment of differences between networks, and mining and validation techniques, with Moreso, noticing

how the blockchain introduces, decentralised techniques to engaging with internet-based products and services. The blockchain brings consumers an instance of validation with mining for transactions that is authenticated with digital signatures and cryptography. Blockchain technology advances the processes of being able to interact and engage with verifiability between parties in a transaction, and enables interconnections across the network with permissionless operations. Blockchain technology from a high level understanding is basically, "*An individual network that processes transactions, validated with computation secured by algorithms, with innovation in identity solutions, digital signatures and the provision of interconnectivities".*

Important High Level Blockchain Technology Facts

1: Blockchains are decentralised computing networks that operate with a formal procedure of validation and mining from peers on each network. The validators and miners process transactions, sent by network participants. Each new set of data that is produced by the miners and validators comes in a block, hence the name "blockchain".

2: Blockchains run in canonical bottom-up sets of data. Each blockchain starts at the "genesis block" which is known as block number 0. Once the first blockchain has been mined or validated, there is a set-time between the next block. Blocks do not come in random order or chaotic frequency. Every block in a chain is set-timed. Each block comes with its own transactions and reward for mining or validating. The rewards go to the miner and the transaction begins to create the state of each blockchain network.

3: Blockchains are cryptographically secured with algorithms. Each blockchain has its own algorithm that it uses as network infrastructure. The most commonly known is SHA256, which is a maths puzzle that takes longer than the age of the universe to complete.

4: Blockchains have capabilities that traditional databases cannot achieve. The blockchain is able to generate deterministic outputs with mathematical security and authentication with network procedures and transaction processing.

5: Blockchains allow transactions with permissionless entry to engagement within each network. The requirements for sending transactions is just owning a network key-pair and having something to send. Each network facilitates the transfer of value, unless it is only be used for storage.

6: Blockchains record transactions outputs and store them. The main function of a blockchain is to record and validate network transactions. Each transaction comes with its own attributes and unique verifiers to legitimise the execution of each transaction and to ensure there is nothing duplicated on each network.

7: Blockchains use memory pools to store transactions before generating new blocks on each network. The memory pool is where transactions are initially sent to wait for the miners and validators to generate new blocks and then add them to the chain.