BLOCKCHAIN INNOVATION AND DIGITAL TRUST

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CIO Academy Asia had organised a Masterclass on the topic of "Blockchain Innovation and Digital Trust", led by Masterclass Trainer, Eugene Yeo, Senior Advisor to CIO Academy Asia and former CIO and COO of MyRepublic Singapore. The masterclass was organised with the support of Ant Group.

This report is based on the insights shared by the expert trainer and the participants during the masterclass.

According to Deloitte, Blockchain as a technology is outgrowing its adolescent cryptocurrency identity, and is assuming the role of trusted gatekeeper and purveyor of transparency in the emerging "trust economy".

What connects and drives this trust economy? Opening the masterclass session, P. Ramakrishna, CEO of CIO Academy Asia, said that the digital world is becoming more decentralised, distributed and disintermediated. Also, peer to peer networks have matured such that large organisations can now embrace distributed networks. Trust is the new currency today, as it underpins all forms of business, more so in the digital world.

According to Eugene Yeo, Senior Advisor to CIO Academy Asia and former CIO and COO of MyRepublic Singapore, what makes the blockchain technology potent are its four key properties: it's secure (all records are individually encrypted), distributed (all network participants have a copy of the ledger for complete transparency), anonymous (the identity of the participants is either anonymous or pseudonymous) and immutable (any validated record in the chain is irreversible and cannot be changed by anyone).

Blockchain Ledger

Blockchain is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. The ledger itself can also be programmed to trigger transactions automatically.

A genesis block is the first block of a block chain. Once the genesis block is created, the hash from the previous block is carried forward in the next link and this process continues across transactions.

Yeo explained how a blockchain transaction works in the following steps:

- A transaction is sent from Party A to Party B
- Several interactions are grouped into a new block
- The new block is sent to every node (participant) in the network
- Nodes validate the transaction using a consensus model
- Nodes receive a reward and fee for validating the transaction

Consensus models

Consensus models define the security of the blockchain by maintaining consistency across the shared state of the blockchain. The blockchain is built around the principle of fault tolerance.

According to Capegemini, blockchain without consensus models cannot serve the purpose it has been designed for, as the core of trust protocol on the network is driven through consensus models.

Yeo highlighted the following consensus models for blockchains:

- Proof of work - In this model, mining capacity depends on computing power; miners receive block rewards to solve a cryptographic puzzle.
- Proof of stake - validating capacity depends on the stake in the network; validators do not receive block rewards but they collect transaction fees as rewards.
- Proof of authority - Proof-of-Authority (PoA) is a new consensus algorithms family that provides high performance and fault tolerance. In PoA, rights to generate new blocks are awarded to nodes that have proven their authority to do so.

Types of blockchain

There are mainly two types of blockchains: permission-less and permissioned. The Blockchain Council defines them as: "A permissioned blockchain needs prior approval before using whereas a permissionless blockchain lets anyone participate in the system. Though the two systems might sound similar, they cannot be used for the same things."

Blockchain wallets

A blockchain wallet is a digital wallet that allows users to store and manage their Bitcoin, Ether, and other cryptocurrencies. As such, blockchain wallets help to manage, secure or transact blockchain tokens or crypto currencies.

Blockchains, smart contracts and tokens

Eugene highlighted three areas that are being revolutionised using

blockchain technology: cryptocurrencies, smart contracts and digital tokens. At the heart of all these technologies is the need for decentralisation to create and maintain digital trust among participants and stakeholders.

While cryptocurrencies such as Bitcoin, Ethereum, Tether, Dogecoin, etc., create trust using consensus and a distributed ledger, smart contracts are self-executing business automation applications that run on a decentralised network such as blockchain. Adoption of this technology offers many advantages to organizations such as speed and efficiency, trust and transparency, security and cost savings, he said. The most popular smart contract platform is currently Ethereum.

Ethereum is a blockchain conceived in 2013, and released in 2015 to address different limitations present in bitcoins and especially allow the execution of short programmes in the blockchain (DeFi, DApps, Smart contracts). Besides Ethereum, other smart contract chains are Solana, Cardano and BSC.

Data and Oracles

Eugene also discussed the importance of data and Oracles. Oracles are data feeds from external systems that feed vital information into blockchains that smart contracts may need to execute under specific conditions. In order for smart contracts to expand into practical and real-world use cases, access to accurate data is crucial.

Tokenomics, DeFi, and NFTs

Besides cryptocurrencies and smart contracts, the third technology that

has gained prominence is tokens. Several types of tokens are already available in the market today: there are security and utility tokens, and Fungible and Non-Fungible tokens (NFTs).

Tokenomics comes from the word token and economics. It is the study of the economics of crypto token, from its functionality to its allocation policy in order to determine its demand and supply movements.

Tokenomics helps with determining the current and future value of the token in question.

Tokenomics factors include distribution and allocation of tokens, initial supply of token, market liquidity, token model (fixed, inflationary, deflationary), and price stability (floating or pegged)

Because of the fluctuating value of tokens, the concept of stable coins was introduced. A stable coin is a crypto currency that remains stable in value against a pegged external asset class.

Since cryptocurrencies are highly portable and Stablecoins that remain pegged against an external asset class, organizations can take advantage of them as they reduce volatility in currency value and are an excellent cross-border solution. Two popular stablecoins are USDT (Tether) and USDC.

Besides the Stablecoins, there is one form of cryptocurrency that is gaining traction: Central Bank Digital Currency (CBDC). It is a legal tender issued by a bank in a digital format. Many central banks are already paying attention to it because of the advantages it provides to

governments. These include maintaining control of monetary policy, traceability of currency and enhanced anti-money laundering (AML) protection. According to Eugene, China is way ahead of other countries in the adoption of CBDC and Singapore is also making good progress in this space.

The emergence of CBDC is concurrent with the popularity of cryptocurrencies. However, there is a difference between cryptocurrencies and CBDC: unlike these private cryptocurrencies which are decentralised and public blockchain, CBDCs are centralised and legal tenders issued by central banks, part of a private blockchain. CBDC's are not considered DeFi.

Eugene said he expected to see continued exponential growth in the Decentralised Finance (DeFi) industry, with projects that will simplify and harmonise how we bank today with the decentralised way of tomorrow. These growth areas include cross-border payments and remittances, lending and loans, Exchanges and inflation protection.

As far as NFTs are concerned, they are truly unique, and they cannot be broken down into parts (such as a work of art). NFTs have gained value because of their ability to capture characteristics of a product in terms of its originality and authenticity. Many business sectors are already adopting NFTs and it will continue to see exponential growth because it provides protection and encourages innovation. The use cases of NFTs are already making waves in areas such as gaming, digital arts and museums, real estate, music and social media (in the form of Creator coins). So, we should expect to see continued exponential growth in the NFT industry, with projects that continue to drive NFTs into more

focused interest groups that helps protect and encourage innovation. These growth areas include:

- Gaming industry
- Digital arts and museums
- Rare collectible
- Metaverse
- Incumbent media (Warner music)
- Fractional investing
- Social media (creator coins)

Metaverse

The latest trend to accelerate the adoption of blockchain technology is metaverse.

The metaverse is defined as "interconnected, experiential, 3D virtual worlds, where people located anywhere can socialise in real-time to form a persisten, user-owned, internet economy, spanning the digital and physical worlds".

In the metaverse, there are trends to use NFTs or tokens for trade.

Metaverse has picked up significant interest ever since Mark Zuckerberg, the founder of Facebook, announced the rebranding of Facebook to Meta Platforms.

Combined with NFTs and DeFi, Metaverse environments build on the foundations of other eco-systems and may eventually become the new social networks of the future.

In summary, Eugene said Blockchain technology is changing the Informational Technology landscape and while this technology's adoption remains largely confined to a few sectors such as cryptocurrency, banking and logistics, to name a few, its use cases are growing so rapidly that most organisations will have to adopt it in the long run. The key growth areas for blockchains are gaming worlds, tourism, shopping, entertainment, physical-digital marketplaces, social networks, and convergence of DeFi, NFTs and Metaverse.

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