Blockchains for Internet of Things

What is the issue?

- The Internet of Things is gaining momentum as the much deployed technology in the world across sectors.
- In this backdrop, here is how the blockchain architecture could satisfy the key demands of IoT.

What is IoT?

- The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people.
- These are provided with unique identifiers (UIDs) and the ability to transfer data over a network.
- The transfer happens without requiring human-to-human or human-to-computer interaction.

How significant is this becoming?

- Estimatedly, the number of connected devices in the world could grow 2.4-fold, from 6.1 billion in 2017 to 14.6 billion by 2022.
- Traffic from these connected devices is expected to grow seven-fold over the same period.
- With this, there will be an exponential increase in both the number of devices and amount of data transmitted.

What are the challenges?

- With IoT, a large amount of data is being captured from all around people by millions of devices.
- So there are reasonable concerns with respect to scalability, reliability and security, when considering the creation of large IoT networks.
- So it is essential to provide for an acceptable level of confidence in the platforms that will power the Internet of Things.
- Besides, a key question is if optimum economic value could be derived from the vast amount of data generated.
- The answer is not that encouraging as the quality and adequacy of the back-office systems and technologies are not adequate yet.
- Globally, only about 30% of IoT projects survive beyond the pilot phase.

- This is a powerful indicator that much needs to be done to effectively tap this new technology.

How does blockchain help here?

- The blockchain or multi-ledger technology provides the possible solution in handling the large amount of data.
- Blockchain was designed specifically as a back-end for Bitcoin, a crypto-currency.
- [It is a digital public ledger that records every transaction. Once a transaction is entered in the blockchain, it cannot be erased or modified.]
- But the conceptual architecture of blockchain, being versatile, has evolved and found theoretical application in nearly every industry.
- It can work as a distributed network, and safely execute on a wide variety of requirements.
- This makes it an ideal candidate to support the level of innovation and adoption required for IoT to succeed.
- The key issues of scalability, identity management, autonomy, reliability, security and marketing can all be addressed.
- But the IoT - Blockchain combination rarely gets the attention it deserves.

What are the key features of IoT-Blockchain use?

- **Decentralisation** - The current centralised architectures of IoT networks is problematic when it comes to citywide networks.
- Decentralisation is a core feature of blockchains; the expected points of failure and scalability bottlenecks in IoT can be adequately addressed.
- If implemented appropriately it could allow for a shift to peer to peer network designs, greater fault tolerance and expedited scalability.
- **Managing identities** - A massive IoT network would also be required to manage identities - of both users and things.
- With blockchain, all identity records can be contained within a single network, thus facilitating their discovery and management.
- **Autonomy** - The very nature of IoT mandates a certain level of autonomy in the functioning of enabling platforms.
- The reliance on server farms is expected to be significant for any large scale IoT implementation.
- With blockchain, devices would be able to communicate without the need for large server farms.
- **Security** - In IoT, authenticity and verification of data are critical, especially in the case of digitised citywide networks.

- The tamper-proof nature of the blockchain provides the much-needed security to IoT platforms.
- Powered by smart contracts, the blockchain could enable secure communications between devices, with scope for radical innovation.

How could large scale adoption be ensured?

- The blockchain possesses the ability to increase market access for deployed services.
- Transactions between peers can be simplified to a significant degree, and without the need for authorities or third parties.
- The blockchains' trustless environment ironically offers unprecedented levels of distributed security.
- This is ideal for the deployment of micro services and for the simplified execution of micro transactions.

Source: Business Line

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