

What Is Enterprise Blockchain? And Why Will It Be The Mainstay For Governments And Businesses?

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Starting from Bitcoin

It has been 10 years since the Bitcoin platform was incepted in 2008. With Bitcoin, the concept of blockchain was introduced to the world. Bitcoin is a platform which allowed multiple (unrelated) parties to work together to share and verify the information. Bitcoin is a decentralised platform where the data is replicated across multiple computers across the network. Each computer in the network takes part in verifying the data that is broadcasted using a process called consensus. In Bitcoin, the consensus protocol used was proof-of-work (otherwise known as bitcoin mining).

Blocks (or sets) of data or transactions were chained together by tagging a summary of the previous block to the header of the current block. Hence, the term 'blockchain'. Consensus, combined with the chaining of data, made the verified information extremely difficult to tamper with. Each transaction on the blockchain is also timestamped (every action is recorded with the time it was made), this action cannot be back-dated, creating an immutable audit trail. These features also allowed Bitcoin to address the double-spending problem (a common challenge for digital currencies).

When the price of Bitcoin reached USD\$1000 in 2014, it caught the attention of enterprises (in particular, financial institutions). The immutable nature of the data and the ability to prevent double-spending of bitcoins was of particular interest to these enterprises. This sparked a series of experimentation or proof-of-concepts from industries ranging from finance to supply chain, food safety, insurance and more.

Experimenting with enterprise blockchain

In 2014, Standard Chartered Bank, DBS and the Infocomm Development Authority of Singapore initiated a blockchain proof-of-concept for trade finance on blockchain for letters of credit, it was one of the earliest enterprise blockchain applications. Another noteworthy activity in the space is Project Ubin which is lead by the Monetary Authority of Singapore (MAS) and is in its third phase. Project Ubin aims to explore the use of blockchain or distributed ledger technology for clearing and settlement of payments and securities. The MAS collaborated with the industry over the 3 phases, including banks, financial institutions, technology companies and startups.

In most business scenarios, there are multiple sets of accounts. For example, a transaction between two companies may contain an invoice, a shipping agreement, an insurance contract as well as a bank transaction which involves two bank accounts. Due to the inability for the systems that are recording this information to talk to each other, there may be inconsistencies across these set of books, creating problems that lead to disputes and the inability to reconcile accounts. The use of blockchain to store this information can help to create one source of truth for the whole platform; stakeholders can get instant updates and be able to act on them.

With the rise of blockchain also came a renewed interest in smart contracts. Smart contracts are digitised agreement between parties where performance on the agreements can be automated. For example, a smart contract can be programmed to transfer a digital asset based on a pre-agreed set of agreements. The trust and immutability that blockchain provides, combined with the ability to digitise assets, made smart contracts feasible and executable. The Ethereum platform, which was conceptualised in 2013, aims a decentralised global computer that runs smart contracts: applications run exactly as programmed without any possibility of censorship, fraud or third-party interference. Smart contracts, when applied to enterprises, can improve business processes. It can automate processes that required manual verification, potentially reducing the dependencies on intermediaries.

Enterprise experiments on the blockchain have also revealed incompatibilities of public blockchains like Bitcoin and Ethereum. Generally, for enterprise applications, the network should be private (or permissioned). Participants need to be identified, and their privacy needs to be appropriately protected. These requirements gave rise to projects like Hyperledger (Linux Foundation), Quorum (JPMC) and Corda (R3).

The fore-mentioned platforms have been used to build a variety of blockchain applications. The Marco Polo Network is built using Corda technology for facilitating trade and working capital finance solutions between banks and their corporate clients. IBM Food Trust uses blockchain technology to create visibility and accountability in the food supply chain. It uses a permissioned and shared food system database to connect growers, processors, distributors, and retailers through. Deloitte, Ernst & Young, KPMG and PwC have joined a pilot with 20 Taiwanese banks to test blockchain technology for fiscal audits.

Considering data security and privacy

The influence of blockchain on enterprise systems will continue to grow as more applications go live. Key considerations for such systems include privacy, security and economics. These systems must be secured to prevent any tampering and leak of data. Data must consider the privacy requirements of the user; this is not just a technical requirement. Business and economic requirements must also be considered, sharing of information between entities should take into account the competitive environment. For example, one may not want a downstream buyer to reveal quotations to competitors. This proposition is also advocated in our latest blockchain project - Jupiter Chain - which is centered on delivering privacy-preserving analytics and solving the conundrum between data privacy and having easy access to big data for analytics and learning. [For more information on Jupiter Chain, please refer to jupiterchain.tech](#)

Due to these considerations, the technical and business design of the platform is equally important. The space is still growing and evolving. Currently, enterprises are in a stage of learning by doing with blockchain. As the implementations mature, we will see exciting times ahead for enterprise blockchains.