

BLOCKCHAIN

THE RISE OF BLOCKCHAIN

THE EMERGING TECHNOLOGY ENHANCING TRUST IN RECORD KEEPING, FINANCIAL TRANSACTIONS AND SUPPLY CHAINS

Blockchain technology has evolved significantly since the introduction of Bitcoin in 2008 – the first P2P (peer-to-peer) decentralised electronic cash system. Today, innovators across various industries are seizing up the opportunities afforded by a truly revolutionary technology that benefits business through greater transparency and traceability, enhanced security, increased efficiency and reduced costs. Here, we take a closer look at precisely what blockchain technology is, its numerous advantages, and how you can begin reaping the rewards of investment.



WHAT IS BLOCKCHAIN?

Blockchain is a system of recording information in a way that makes it extremely difficult or impossible to change, hack or cheat. A blockchain is essentially a distributed, or decentralised, public ledger – a digital system for recording transactions among multiple parties in a verifiable, tamperproof way. The ledger itself is duplicated across the entire network of computer systems on the blockchain, and each block is given a unique cryptographic signature called a hash (or identity). Every time a new transaction occurs, a record of that payment is added to every participant's ledger. It would thus become immediately apparent if the blockchain were at all tampered with – if a hacker wished to corrupt the system, they would have to change every block in the chain across all of its distributed versions. This decentralised database managed by multiple participants is further known as Distributed Ledger Technology (DLT).

While blockchain is most widely known as the digital record-keeping technology behind Bitcoin and other cryptocurrency records, providing lightning-fast, cheap and reliable payment processing services, this game-changing system is now being applied to supply chain management. For cryptocurrency networks, the main function of blockchain is to enable an unlimited number of anonymous parties to transact securely and privately without a central intermediary. For supply chains, it is to permit a limited number of known parties to protect their business operations against malicious actors while upholding optimum performance.



THE ADVANTAGES OF BLOCKCHAIN

Enhanced visibility & traceability

With the blockchain ledger, each time an exchange of goods is recorded on a blockchain, an audit trail is presented to trace where the goods came from. The chronological string of blocks reliably connects various operational flows (information, inventory and finance), ensuring no blind spots in the entire supply chain. When it comes to issues such as missing or delayed shipments, duplicate payments or mistakes in inventory data (all of which are incredibly difficult to detect in real-time), blockchains provide an exact source or fix by tracing the sequence of activities recorded in each block.

When blockchain record keeping is used, assets such as inventory, orders and payments are given unique identifiers, which serve as digital tokens. Additionally, participants in the blockchain are too given identifiers, or digital signatures, which they use to sign the blocks they add to the blockchain. As such, every step of the transaction is then recorded within the system as a transfer of the corresponding token from one participant to another. The result is a complete, trustworthy audit trail of numerous categories of activities, which helps greatly reduce (if not eliminate) common execution, traceability and coordination problems. Since participants have their own individual copies of the blockchain, each party can review the status of a transaction, identify errors and hold counterparties responsible for their actions.

In industries such as medicine, blockchains can be used to track the supply chain from manufacturer to distributor, to confirm medicines are legitimate and identify and trace counterfeit, stolen or harmful products. As this kind of application requires minimal sharing of information – with purchase orders, invoices and payments not needed on the same blockchain – companies do not have to share competitive data and are thus more inclined to participate on the platform, protecting consumers in the process.

Improved security & privacy

While blockchain does afford higher visibility of actions taken across the platform, the very make-up of the technology ensures increased security and privacy for all participants. Blockchain networks are typically labelled as either public or private (which describes who is allowed to participate) and permissioned or permissionless (which describes how participants gain access to the network).

Public blockchain networks allow anyone to join and for participants to remain anonymous, with internet-connected devices used to validate transactions and achieve consensus. Private blockchains, however, use identity to confirm membership and access privileges, and only permit known organisations to join. Together, the organisations form a private, members-only “business network”, with participants who are accepted having access to the transaction ledger. This network type is preferable for compliance and regulatory reasons.

Furthermore, blockchain creates an unalterable record of transactions with end-to-end encryption, which shuts out fraud and unauthorised activity. All transactions are time and date stamped, with participants being notified of updates immediately, and cannot be changed or deleted. This immutable and incorruptible nature of blockchain makes it safe from falsified information and hacks.



Increased efficiency & speed

Due to its decentralised nature, blockchain eliminates the need for intermediaries and replaces remaining manual processes, ensuring all transactions are handled significantly faster than with conventional methods. By allowing P2P cross-border transfers with digital currency, blockchain not only ensures participants can buy and sell globally within what is often just seconds, but also enjoy enhanced security and access to multiple payment methods. While times can vary, depending on network traffic and how large each block of data is, the streamlined service enables companies to reconcile purchase orders, invoices and payments much more easily and track the progress of a transaction with counterparties.



Additionally, many of the functions performed within the blockchain can be automated, triggering the following action in the sequence when certain conditions are met. This is achieved through smart contracts, in which lines of computer code use data from the blockchain to verify when contractual obligations have been met, and actions such as the release of funds and recording of ledger entries can be completed automatically and immediately. As smart contracts are digital, there is further no paperwork to process and no time spent reconciling errors that often result from manually filling in documents.

Reduced costs

With the elimination of middlemen (vendors and third-party providers), blockchain helps drastically cut costs for organisations across various industries. By reducing manual tasks such as aggregating and amending data, as well as easing and auditing processes, blockchain removes the need for intermediaries to handle transactions, and, by extension, their associated time delays and fees.

According to a Santander FinTech study, DLT could reduce financial services infrastructure costs between \$15 billion and \$20 billion per annum by 2022, achieving even greater cuts in the coming year. This opens up the possibility to decommission legacy systems and infrastructure and significantly decrease IT costs.

WAYS TO INVEST

There are two primary areas of blockchain technology to consider when investing: Bitcoin and the businesses that are developing and implementing new products that exploit the potential of DLT for uses ranging from financial technology to healthcare and global shipping. With regards to the latter, a number of established companies – including Intel Corp. (INTC) and IBM Corp. (IBM) – are making significant investments in blockchain technologies for broad use by a wide range of industries. Both companies have partnered with Hyperledger Foundation on its Hyperledger Fabric platform to provide the building blocks for scalable blockchain for business use. IBM also specifically provides services led by more than 1,600 blockchain experts, who use insights from 100+ live networks when building solutions.