

# The Rise of Blockchain Technology in Businesses

A blockchain is a digitally distributed and decentralized ledger of all transactions across a peer-to-peer network. Using this technology, transaction participants can confirm transactions without a need for a central clearing authority, making the technology a legitimate disruptor for fields like contracts, financing, and supply chain.

Benefits of blockchain technology include:

- Immutability: ensures data cannot be altered through features like temper-proof ledgers.
- Efficiencies: accurate tracking and efficient document processing
- Decentralization: allows transactions to be made directly from person to person without the assistance of a third-party, with shared decision-making power for each participant.

## HOW IT WORKS



1: Transaction requested by a user.



2: The transaction request is broadcasted to nodes and the nodes validate the transaction. Nodes are computers that run the blockchain software on a Peer-to-peer internet network.



3: The transaction's information, such as contracts, form a new block of data which would be stored in the blockchain.



4: Each node keeps a copy of the complete blockchain. The new block is now permanent and cannot be tampered with.



5: Transaction complete.

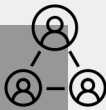


## Have you heard about Bitcoin and cryptocurrency?

Blockchain is the technology that enables the existence of cryptocurrency, and Bitcoin is the best-known cryptocurrency.



### Case 1 BLOCKCHAIN IN SUPPLY CHAIN

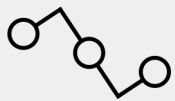


#### Issues in the Sector

- Time-consuming process to trace the origin and paper records of a good as tracking needs to happen at segregated entities.
- An inefficient tracking process prevents prompt risks mitigation and product recall.
- Prone to loss and damage of production or distribution record, particularly human error or fraud.

#### Walmart's Food Supply Chain Optimization- The 2016 Pork Pilot Program Launch

- Blockchain features in the pork pilot program include unique smart-tagged pigs, farm environment and food safety recorded on temper-proof ledgers, and more.
- Benefits:
  - Digitalization ensures the correctness and traceable information such as the origination details, manufacturing and processing information, storage temperatures, and shipment date, etc.
  - If a foodborne disease outbreak occurs, the concerned products can be traced back to their sources in a matter of seconds instead of days, and all users on the blockchain are notified simultaneously.
  - Minimizes possibility of corruption since it prohibits tampering or old records.
  - Avoid the problem of wasting or spoilage caused by tracing inaccuracy.
  - Utilizes a shared ledger to accommodate many-to-many relationships.



### Case 2 BLOCKCHAIN IN LOGISTICS



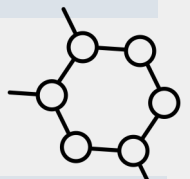
#### Issues in the Sector

- Payment conflicts and delays due to cross-boarder trade.
- Asymmetry of information between buyers and sellers, particularly the reporting of hazardous commodities.
- Lengthy business processes with various participants, entities, and languages.

#### The Potential of Blockchain Implementation at the Haiko and Sanya Port Hub, China

- The port hub is China's principal port in the south and has extensive ties with sporadic Southeast Asian countries.
- Applicable blockchain features:
  - Smart contracts automate the implementation of agreements when certain criteria are satisfied and recorded on a blockchain. (ex. Insurance reimburses user automatically in case of delayed shipments.)
  - Asymmetric key cryptography<sup>1</sup> and timestamps to allow authorities verify container content and sensor data legitimacy.
- Benefits:
  - An unified blockchain database ensures real-time access to untampered trade files instead of using paper documents.
  - Port can manage congestions and shipment priority efficiently using GPS tracking information on the database.
  - Reduces average container wait time as well as delivery and process time for paper documents.
  - Transportation businesses can maintain a publicly available resource record and reputation score to be assessed by potential clients.

### Case 3 BLOCKCHAIN IN SUPPLY CHAIN FINANCE<sup>2</sup>



#### ISSUE IN THE SECTOR

- Small and medium-sized enterprises (SMEs) face serious difficulties in obtaining credit to borrow funds due to limited collateral available and smaller operations when compared to core corporations in supply chain.
- External stakeholders in the supply chain face information asymmetry as SMEs are not transparent, adding difficulties for lenders to satisfy their risk mitigation requirements.
- Lengthy and complicated approval process, typically 3 to 4 months, between loan application and credit disbursement.

#### Tencent's Supply Chain Finance Enhancement— The 2018 We Chain Program Launch

- The program is a blockchain technology based platform that aims to assist SMEs with financing. For example, a Shenzhen-based restaurant issued the first blockchain-based invoice in 2018 and its customers may view a digital invoice for corporate expense reimbursement via We Chain.
- Benefits:
  - Information symmetry created by a common system and shared ledger among supply chains allows rapid communication of payable and receivable details.
  - We Chain utilizes the private chain blockchain feature. In a private chain with information only accessible to certain supply chain participants, data processing is faster with fewer users. As a result, it requires less time to reach a consensus to validate the information.
  - We Chain protects the supply chain participants from default risk by using smart contracts. Smart contracts complete fund payment, clearing and financial reconciliation automatically, enhancing financial efficiency and reducing the potential risks related to human factors.
  - The account opening process is easy, making it suitable for SMEs and covering a wider range of levels in the supply chain.

<sup>1</sup> Asymmetric key cryptography is a type of encryption that allows both parties in the transaction to encrypt and decrypt data using two pairs of keys. Typically used to verify the authenticity of data using digital signatures.

<sup>2</sup> Supply chain finance is a process where a vendor in a transaction can request early payment on its invoice if it requires additional liquidity. The buyer can opt for financing through third party financial institutions or investors, if no cash flow is available.