RESEARCH ARTICLE   OPEN ACCESS

How Block chain Benefits Businesses

Nik Tehrani, PhD*, Mamoun Samaha, PhD Candidate **

International Technological University 2711 N 1st St. San Jose, CA 95134

--************************--------------------------------

Abstract:

A blockchain is a shared ledger sent via the internet in which transactions are permanently recorded without any reversal or alteration. A business transaction is permanently encoded into a block of digital data which has a unique identification. A user's identity is concealed via complex cryptography represented only by a public address. The three main properties of the blockchain technology are: decentralization, transparency, and immutability. No central authority oversees a blockchain network. It is a democratized system since it is a shared and immutable ledger, and the data in it is available for anyone with permission to access.Centralized systems have vulnerabilities because all data is store in one location, making them easy targets for hackers. What can go wrong with a centralized system? (1) Software upgrades can halt an entire system, (2) if the centralized system shut down for any reason, no information can be accessed, (3) if the system becomes corrupted or malicious, the data can be compromised. By removing centralization, information is no longer stored in one network. Decentralizing the system will remove centralized storage, allowing users to communicate without intermediary of a third party.Bitcoin is a volatile cryptocurrency using blockchain. Bitcoin determines its value by supply and sdemand and is entirely decentralized, making it impossible for any one individual to control the entire supply.Blockchain may prove useful in different industries including: supply chain management, quality assurance, accounting, smart contracts, voting, stock exchange, energy supply, and peer-to-peer global transactions.

Keywords — **Blockchain, centralized system, shared ledger, immutability, centralized storage, hackers, client-server model, bitcoin, supply chain management, quality assurance, accounting, smart contracts, voting, stock exchange, energy supply, peer-to-peer global transactions.**

--************************--------------------------------

INTRODUCTION

A blockchain is a shared ledger sent via the internet in which transactions are permanently recorded without any reversal or alteration. A business transaction is permanently encodedinto a block of digital data which has a unique identification.A user's identity is concealed via complex cryptography represented only by a public address. If a person's transaction history was found, it could not be traced[1][2].

BLOCKCHAIN PURPOSE

Businesses implement blockchain when (1) data is shared by multiple parties; (2) data will be updated by multiple parties; (3) verification is required; (4) information is time sensitive; and (5) transactions by different participants are dependent on one another[3].

BLOCKCHAIN FURTHER EXPLAINED

Each block is connected to a previous block and one following, creating an irreversible chain of blocks. These blocks are permanently chained together, which preventsthem from being changed or having another block inserted between two existing blocks. When the blockchain is distributed among business network members, it becomes a shared system of record which eliminates the requirement for reconciliation of disparate ledgers. Information is shared only on a need-to-know basis, as each member of a network has to have permission to access the blockchain. The information is irreversible since validated transactions are permanently recorded. No one can delete a transaction, not even a system administrator[3].

No central authority oversees a blockchain network. Itis a democratized system since it is a shared and immutable ledger, and the data in it is available for anyone with permission to access[2]. Everything in a blockchain is transparent and anyone who contributes to it is accountable for it. A spreadsheet, for example, can be duplicated across a network of computers thousands of times, and then be regularly updated, yet the original blocks are unchanged.The three main properties of the Blockchain Technology are: decentralization, transparency, and immutability
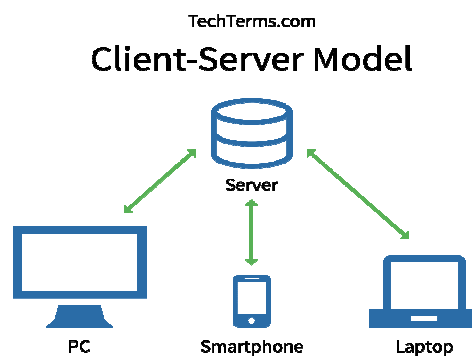
CLIENT SERVER MODEL

Figure 1. Client Server Model[2]

A centralizedsystem is used by banks which store money, and the only way it can be retrieved is by going through a bank. The traditional client-server model is a perfect example of this:In a client server model, when a google search is executed, a query is sent to the server which then sends a reply with the relevant information[4]. Centralized systems have vulnerabilities because all data is stored in one location, making them easy targets for hackers.

CENTRALIZED SYSTEM PROBLEMS

Software upgrades can halt an entire system, and if the centralized system shuts down for any reason, no information can be accessed. If the system becomes corrupted or malicious, the data can be compromised. Decentralizing the system will remove centralized storage, allowing users to communicate without intermediary of a third party.

BITCOINS AND BLOCKCHAINS
Bitcoin is a volatile cryptocurrency, which today is worth several thousand dollars per Bitcoin[5].The underlying technology of Bitcoin is the blockchain. Bitcoin determines its value by supply and demand, which is same as the equity class, and is entirely decentralized, making it impossible for any one individual to control the entire supply. Bitcoin volatility is the negative side of Bitcoin[6].

INDUSTRIES BENEFITTING FROM BLOCKCHAIN
Blockchain potentially be used by many industries, such as agriculture, insurance, and accounting. Transactions can occur globally via the internet, eliminating the requirement of a contributor to be physically present at any given location. Blockchain reduces repetition and paperwork, and eliminates probable inefficiencies that may cause delays[3]. Blockchain is predicted to transform various industries due to quick, verifiable transfer and tracking[3].
Blockchain can be used to create cryptographic ledger systems for the financial services industry to help banks, stock exchanges, and credit-card companies rapidly and store secure trade, and manage financial assets. Blockchain may benefit industries including: supply chain management, quality assurance, accounting, smart contracts, voting, stock exchange, energy supply, and peer-to-peer global transactions[8][9].

SUPPLY CHAIN MANAGEMENT
Blockchain technology offers traceability and cost-effectiveness to track the movement of goods, allowing for transparency to B2B ecosystems. It simplifies ownership transfer, production process assurance and payments[8].

QUALITY ASSURANCE
Irregularities can be detected along the supply chain, using a blockchain system to source its point of origin. When used in the food sector, origination, batch information and other important details can be tracked for quality assurance and safety[8].

ACCOUNTING
Recording transactions virtually eliminates human error and protects data due to verification each time they are moved from one blockchain node to the next. This guarantees record accuracy and a highly traceable audit trail. Businesses need only to keep one joint register, guaranteeing integrity of financial information[8].

SMART CONTRACTS
Smart contracts and agreements can be automatically validated, signed and enforced through a blockchain construct, eliminating requirements for mediators. Consolidation into a single platform allows businesses to integrate services without disclosing proprietary information to third parties[8].

VOTING
Blockchain in voting diminishesthe possibility of electoral fraud despite the predominance of electronic voting systems. Blockchain technology also facilitates shareholder voting by providing identification solutions, i.e., identity cards[8].

STOCK EXCHANGE

Blockchain technology is used for securities and commodities trading due to its open, reliable nature. Australia is considering a blockchain-powered system for its stock exchange operations[8].

ENERGY SUPPLY

Commercial institutions and households can use blockchain-enabled transactive gridsfor sustainable energy solutions that accurately track usage, whether it is generated by solar energy, wind or fossil fuels[8].

PEER-TO-PEER GLOBAL TRANSACTIONS

Businesses are using Cryptocurrency for international transfers. Bitcoin and other cryptocurrencieshave enabled expeditious, secure and inexpensive global fundtransfers. P2P payment services have specific limitations, i.e., location restrictions and minimum transfer amounts. PayPal processes international payments, yet usually requires high fees per transaction[6][7].

BLOCKCHAIN: PUBLIC OR PRIVATE?

Blockchain is a distributed ledger that archives transactions among every user in a chain. It is regarded as a single technology, but there are two types of blockchain: public and private.A public blockchain is an open network in which anyone can download the protocol, read, contribute, or participate in the network. It is distributed and decentralized. Transactions are saved as blocks linked to form a chain. Each new block is timestamped and validated by all the computers connected to the network (nodes) before it is recorded into the blockchain. All transactions are made public. Since all nodes are equal, a public blockchain is unchangeable: once verified, data cannot be altered.Public blockchains used for cryptocurrency are Bitcoin and Ethereum (which isan open-source, smart contract blockchain)[1]. A public platform is inappropriate for transactions dealing with sensitive information, such as an individual's personal data or commercial contracts. Private blockchains are more efficient and more cost-effective than public blockchains, which take more time to validate transactions[1].

A private blockchain is an invitation-only network governed by a single entity, and allows only invited users with permission to make transactions without making data public. Access is restricted by allowing levels of permission for users, and confidentiality is protected by encryption.Private blockchains allow for distributed ledger technology without public access or decentralization.

CONCLUSION

Blockchain technology, whether public or private, allows for confidentiality that is protected by encryption. Since all nodes are equal, a public blockchain is unchangeable: once verified, data cannot be altered. However, a public platform is inappropriate for transactions involving sensitive information. A preferable method for such transactions is the private, invitation-only blockchain,overseen by a lone entity, allowing invited authorized users to make private transactions.Blockchain is ideal for Bitcoin technology, and for a variety of businesses that require hacker-free confidentiality of data.

REFERENCES:

1.Heath, N. (2018). What's the difference between a private and public blockchain? In the black. Retrieved from https://www.intheblack.com/articles/2018/09/05/difference-between-private-public-blockchain

2. BlockGeeks. (2019). What is blockchain technology? A step-by-step guide for beginners. Retrieved from https://blockgeeks.com/guides/what-is-blockchain-technology/

3. IBM. (2019). Blockchain. Retrieved from https://www.ibm.com/blockchain/what-is-blockchain?cm_mmc=Search_Google.Blockchain+and+Watson+Financial+Services_Blockchain-_-WW_US

4. Hamal, K. (2019). What is Decentralization in terms of Blockchain technology? https://hackernoon.com/1-what-is-decentralization-in-terms-of-blockchain-technology-e266da2875c1?gi=1f6754a24716

5. iBank. (2018). McAfee on Bitcoin (BTC) Predictionshttps://globalcoinreport.com/mcafee-on-bitcoin-btc-predictions/

6. Bitcoin Price Predictions 2018: How high can Bitcoin price go in 2018? Up to $1 million or down to $100? (In-Depth Analysis). Retrieved from https://toshitimes.com/bitcoin-price-prediction-2018/

7. Kaplan, A. (2019). Bitcoin Price Live – Bitcoin Value Today: Bitcoin volatility is here to stay (Bitcoin Price Prediction 2019) – BTC Predictions. Retrieved from https://smartereum.com/3022/bitcoin-price-live-bitcoin-value-today-bitcoin-volatility-is-here-to-stay-bitcoin-price-prediction-2019-btc-predictions-thu-mar-21/

8. Agrawal, J. (2019). 8 Benefits of Blockchain to Industries Beyond Cryptocurrency. Retrieved from https://www.entrepreneur.com/article/306420

9. Chain Reaction: How Blockchain Technology Might Transform Wholesale Insurance. (2017). PWC global. Retrieved from https://www.pwc.com/gx/en/industries/financial-services/publications/blockchain-technology-might-transform-wholesale-insurance.html