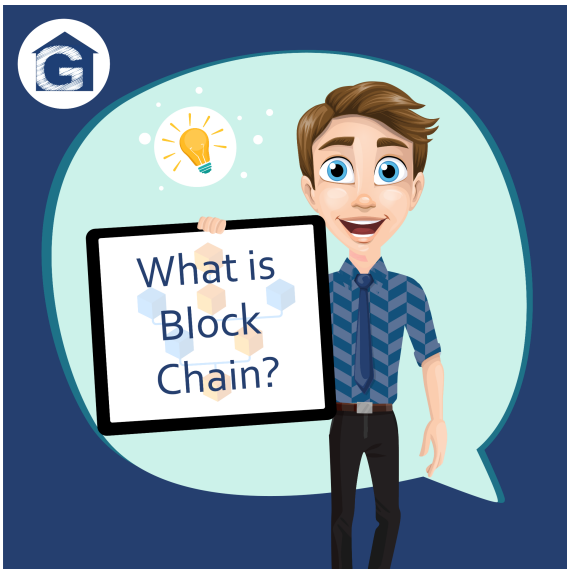
What is BlockChain?

Definition: A digital record of transactions

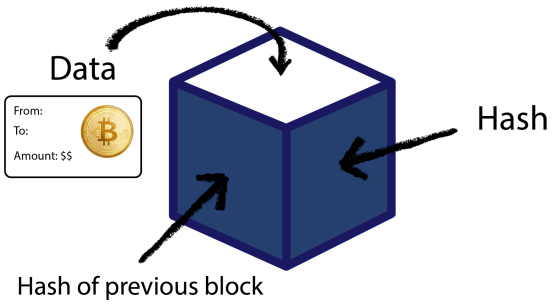


The name comes from its structure, in which individual records “blocks” are linked together in a single list, called a “chain”.

Block Chains are used for recording transactions made with cryptocurrencies, such as Bitcoin, but have many other applications.

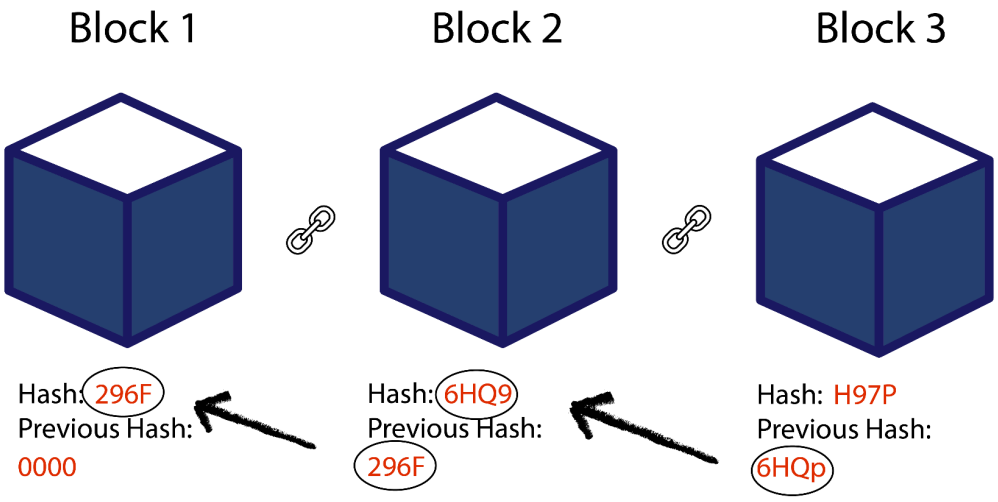
As new data comes in, it is entered into a new block. Once that block is filled, it is chained on to the previous block, which ensures all the blocks are in chronological order.

One Block in a Block Chain



Imagine a company that has a server with over 5,000 computers each with a database containing all of its client’s private information. The company has all of the computers under one roof and has full control of each computer, and the info that is contained in each one.

Similarly, Bitcoin consists of thousands of computers, but each computer that holds its blockchain is in different geographic locations and are operated by separate groups or individuals. Each computer that makes up Bitcoin’s network are called nodes.



The first block is called the "Genesis Block". If you tamper with block 2, it will change block 3's previous has, making the chain invalid.

In a blockchain, each node has a full record of the data that has been stored on the blockchain since its inception. If one node has an error in its data it can use all the other nodes as a reference to correct itself. This ensures that no individual node within the network can alter information. This makes blockchains irreversible.

If one user tampers with Bitcoin's record of transactions all other nodes would cross-reference each other and easily pinpoint the node with the wrong information.

Pros of Blockchain

- Transparent technology: anyone can view its code
- Improved accuracy by removing human involvement in verification. They are approved by a network of thousands of computers which results in less human error
- Decentralization makes tampering harder. Blockchain stores no info in one central location. If a copy of the chain fell into the hands of a hacker, only a single copy of the chain would be compromised.
- Cost Reductions by eliminating third party verification, has limited transaction fees
- Transactions are secure, private and efficient. Blockchain networks are mostly public databases. Although users can access details about a transaction, they cannot access identifying info about who is making the transaction.

Cons of Blockchain

- Significant tech costs associated with mining Bitcoin. Assuming electricity costs $0.03-$0.05 per kilowatt hour, mining costs exclusive of hardware expenses are about $5,000-$7,000 per coin.
- Low transaction per second. Bitcoins “Proof of Work” system takes about 10 min to add a new block to the blockchain. At that rate it is estimated that Bitcoin can only manage 7 transactions per second (TPS). Whereas Visa can process 24,000 TPS!
- History of illicit activities. A lot of dark web transactions use cryptocurrencies
- Regulation: since it's decentralized, there is no one governing body.

Overall

Blockchain has gone far beyond its beginnings in banking and cryptocurrencies and has the potential to go beyond and offer more to the tech world. It can track and verify large ranges of data in a faster and more efficient way than other technologies. Going forward, Blockchain will change the way that our economy works.