

A Brief Look at Cryptocurrencies and How They Work

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Cryptocurrencies are digital-only kinds of currency that behave like money most of the time, but have other qualities that make them different from cash. They do not exist in any physical form in the way that a dollar or euro or yen can be held in your hand as a coin or piece of paper. They also are not issued by governments, nor necessarily controlled by banks.

To understand what cryptocurrencies are and how they can be used, it's useful to know a little bit of the history behind the first widely-adopted cryptocurrency, bitcoin. Bitcoin was created in 2008 by an anonymous person named Satoshi Nakamoto. (To this day, no one knows for sure who Satoshi Nakamoto is, though several people have claimed the identity and even more people have denied it). Nakamoto wrote a white paper describing a "Peer-to-Peer Electronic Cash System"¹. Coming out of the worldwide financial crisis, this paper intended to provide an option to using and trusting banks and governments (or private corporations), by allowing individuals to send each other "electronic cash" on a global, internet-based network.

Nakamoto called this network the Bitcoin Blockchain, and it served several purposes. First, it was designed as a way for computers (called nodes) to connect with each other (peer-to-peer) without needing one centralized hub. (Paul Baran, who did early work on computer networks, illustrates this well). [As a metaphor, you can loosely think of banks as centralized, cloud computing as decentralized, and peer-to-peer networks as distributed. In a distributed model, there is no central point of failure, and networks work together to verify and validate authenticity].

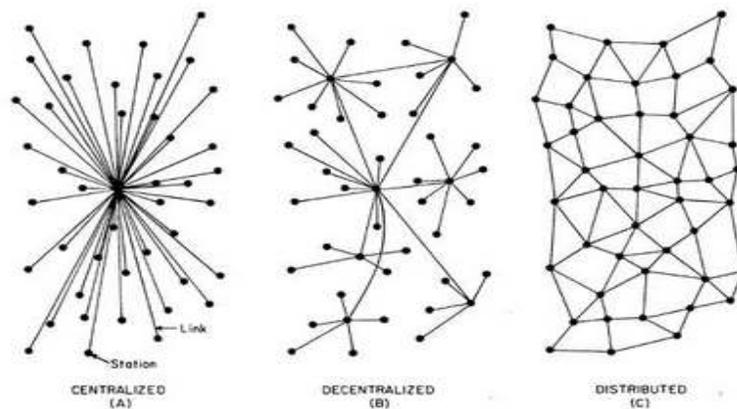
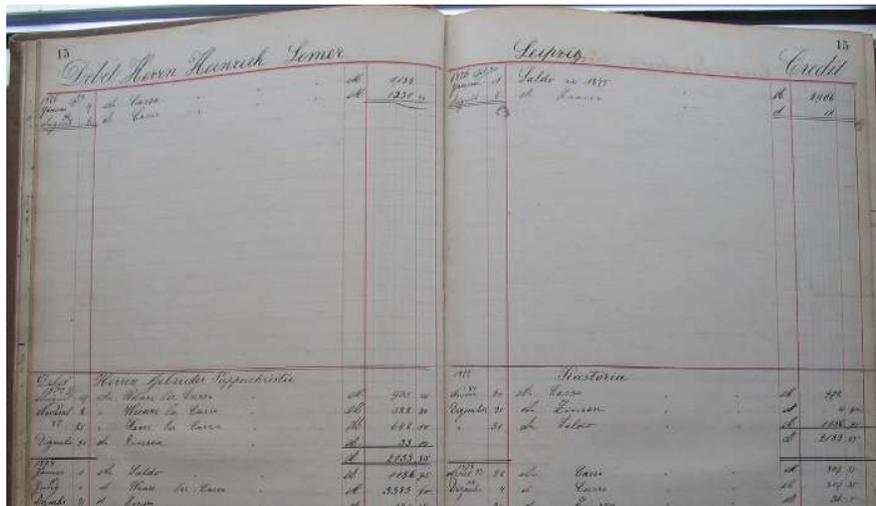


Figure 1 Centralized, Decentralized and Distributed Systems (Paul Baran, 1964)

Secondly, the Bitcoin Blockchain also worked as a transparent ledger tracking all of the digital transactions, recording details (date, time, amount, account from, account to, etc) and adding them chronologically to an ongoing list. Below is a photo of an old banking ledger. Today, all bitcoin transactions can be tracked on a public website like <https://www.blockchain.com/explorer>.

¹ <https://bitcoin.org/bitcoin.pdf>



Bitcoin as a currency also works a little differently than money in that it can be divided into much smaller fractions to enable micropayments, it is pseudonymous (no names attached to accounts, just digital addresses like [1NfAB7oxB4mCVHepT5zLQJmqsK1NLgdRGw](https://coinmarketcap.com/)), and it is cryptographically secured, meaning that it is near-impossible to fake or steal. The most important quality, however, is that it can be owned by individuals in a way that government-issued money never can be. (This feature turns out to be a blessing and a curse – and will be covered later).

So today, people can use bitcoin to buy and sell things without using traditional banks, and they electronically send fractions of a penny without incurring the typical costs of moving money internationally (there is a fee or “gas” for moving cryptocurrencies but it is lower than typical bank fees). In effect, Nakamoto wrote a software program, made it public for anyone to download and use, and created a tool that people found useful and kept using. The implications of this new tool spread, and because Nakamoto had intentionally made the code public and downloadable, other programmers were able to copy it and make their own versions, adding other elements or features as well.

Today there are over 2000 different cryptocurrencies², also called “digital tokens”, and their value goes up and down, much like the value of stocks on the stock market. Bitcoin remains the most popular one (based on market capitalization), with the next ones being Ether (Ethereum), Ripple (XRP), Bitcoin Cash, Litecoin, and EOS. These other cryptocurrencies have differing uses and utility – for example, Ripple is a centralized token used by institutional banks to speed up and facilitate international transfers; anyone can buy XRP but ultimately it is not a public currency in the same way as Bitcoin is. Ether (Ethereum), on the other hand, was intended to be used not as digital cash but as a token with which to fuel (“gas”) online software code execution; its utility has made it valuable, however, and Ether is now used to buy and sell things too. Bitcoin Cash is an off-shoot or “fork” of Bitcoin, with slightly different features, such as an increased number of transactions processed at one time; Litecoin has been called the “silver to

² <https://coinmarketcap.com/>

bitcoin's gold"³, and tends to have faster transaction confirmation times; EOS is similar to Ethereum in that it intends to be a blockchain infrastructure upon which other applications can be built.

Apart from serving as an alternative digital payment tool, all of these electronic tokens are also now being used for investment and speculation – bought and sold as the prices go down and up. Because they are different from traditional currencies, and an evolving and exciting technology, they can act as an alternative store of value for a diversified portfolio. Similarly, however, it's important to understand that cryptocurrencies are difficult to regulate and control, and for these reasons and other they are also considered relatively high risk.

For those interested in becoming more familiar with cryptocurrencies and start to dip their toe into owning some, there are several options. The simplest for those new to the technology is to use a custodial account like Coinbase – this company provides “wallets” for several different kinds of currencies, such as Bitcoin, Ether, Litecoin, among others. Coinbase wallets link to traditional bank accounts, making it easy to buy and sell, and includes FDIC insurance. However, Coinbase is also the actual owner of the digital tokens, thereby diminishing one of the features of Nakamoto's creation.

³ <https://coincentral.com/what-is-litecoin/>