

Cryptocurrency: Rising Star with a Dark Past



What is Cryptocurrency?

Cryptocurrency has become all the rage in recent years, although those who have been skeptical about its prospects have been rewarded by recent, unexpected downturns and failures in the market. But what is cryptocurrency? In a nutshell, it's digital – that is, not printed or “fiat” – currency based on cryptographic principles. Transactions for the currency are tracked through a so-called blockchain which is effectively a digital ledger. This is achieved through encryption, for example with 256-bit keys within the Advanced Encryption

Standard (AES-256).

Users and owners of the cryptocurrency will have a “wallet” that identifies their account through the use of keys, public and private, as utilized with other encryption schemes. Exchanges exist as a sort of bank system where cryptocurrency can be stored or traded. However, cryptocurrency is also famous for its “mining” which is the production of currency through some type of effort. This is described as a “proof of” approach where verifying the blockchain is rewarded with currency. Not all cryptocurrencies rely on the same mechanisms – and they may have different goals with “forks,” as is common in the open source space.

Examples of Cryptocurrency

The most famous, or infamous, cryptocurrency is Bitcoin. While it has been around a long time, Bitcoin only really began to take off in the last decade or so. It has spawned many competitors and even Bitcoin Cash (BCH), spun off as an alternative coin (“altcoin”) with the goal of being easier to use for daily transactions. There are now a multitude of altcoins but also “stablecoins,” the latter so named because their intent is to maintain a stable value. However, many of these have failed under global financial pressure, challenging their ability to be legitimate alternatives to traditional currencies.



The most popular altcoins include Ethereum and Litecoin, although there are variations of these as well. Altcoins are often designed to be easier or faster to use, or to have other superior properties such as decentralization with the bypassing of traditional financial services. Another typical goal is to move away from the computationally-heavy proof-of-work paradigm that Bitcoin uses, something of more concern in the current environmentally-conscious world. A related type of financial instrument is the Non-Fungible Token (NFT) which also utilized a blockchain but, unlike cryptocurrency, is non-fungible and has unique ownership.

Mining, Governance, and Use

The environmental impact of cryptocurrency mining is such that many countries and organizations have curtailed or even banned it entirely within their jurisdiction. This is because mining may require a lot of computation which, in turn, means high power consumption. Energy usage is a constant concern within the larger Green initiative. Moreover, mining becomes more challenging over time which means miners will upgrade their equipment for more specialized ASICs/FPGAs or more efficient servers in general. This creates issues downstream in the second-hand hardware market but is also wasteful with rare materials.

Nevertheless, cryptocurrency has become successful and popular enough to be accepted by many businesses. It has even been rumored that Amazon is looking into its acceptance. This offers more flexibility for consumers but presents unique challenges for a variety of reasons. Identity must be linked to the expenditure but the volatile nature of cryptocurrency also requires a fast turn-around time which can be challenging with denser blockchains. Governments also demand regulation and taxation for cryptocurrency, for example through the Security and Exchange Commission (SEC) in the United States; it has become a serious talking point for treasuries around the world with some accepting or even creating their own cryptocurrencies.

Challenges and Disadvantages

There are many other challenges to face for cryptocurrency to reach the goal of becoming a legitimate alternative currency. Cryptocurrency has a reputation for being utilized by criminals, whether for money laundering or within the Dark Web or Darknet. It's even been used by countries to bypass international sanctions. More recently, it was used for donations to support protests which caused an uproar in the Canadian government. In that case it was further demonstrated that the blockchain is only pseudonymous: privacy is not guaranteed, as after all a ledger is designed to verify transactions.

Cryptocurrency has also had an image problem with criminals using it to receive payment from their ransomware – not only against individuals but also companies, including major utilities. Exchanges and wallets are also potential weak points as currency has been lost or stolen; in fact, a large share of Bitcoin is unpossessed. Certain coins may also be vulnerable to attack, including the so-called “51% attack” when a coordinated group has 51% or

more of the network's hashing rate. There's also the potential environmental or climactic impact, as mentioned above, which is one reason Chia and other alternatives were developed (see our blog on the subject).

Conclusion

Cryptocurrency's future remains mired in doubt. Some investors point to the fact that 1 or 2% of users own up to 95% of many coins. This allows for fraud but moreover suggests that "bubbles" might form and burst within the market. In fact, recent failures have wiped out entire coins. The global economy has become volatile with uncertainty and cryptocurrency has not proven to be a "hedge" against this. Compounding the issue is the fact most governments are now wise to cryptocurrency and are demanding regulation, while Non-Governmental Organizations (NGOs) criticize mining inefficiencies.

There is light at the end of the tunnel, though, as people and companies have become more accepting of cryptocurrency over time, both as an investment and transactional protocol. The reliance on hard materials, such as with a gold standard, or fiat money as printed by the Federal Reserve, has led many countries to propose going crypto. More efficient coins and hardware – including SSDs – also helps assuage concerns, primarily because it's possible to pair mining with renewable resources as with newer data centers. Regardless of short-term outcomes, the concept of cryptocurrency is here to stay – there is simply too much potential.

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