Intro to IT: IT Technologies - Blockchain and Cryptocurrencies

Cryptocurrencies have recently been making waves throughout the mainstream media within the last couple of years. With news of all-time high prices in the most popular of cryptocurrencies, such as Bitcoin and Ethereum, many have speculated about the legitimacy, security, and viability of investing in these relatively new and unknown forms of currencies. Cryptocurrencies are a digital asset, which attempt to imitate physical, state-backed currencies which exist today. The values of these currencies are generally based on supply and demand, as well as the ability to spend the currency. As the mainstream population notices the value of cryptocurrencies, they are contributing to the rise of these prices, and as more stores or businesses accept the currency, alongside a higher demand for the limited currency, the value exponentially increases. The technology behind large cryptocurrencies have been present for quite some time, as Bitcoins have been circulating for over a decade now.
Bitcoins, and many other of the most popular cryptocurrencies, enter circulation from somebody 'mining' them. To 'mine' bitcoin, users must use the computing powers of their devices to help verify the validity of bitcoin transactions. As without these 'miners', the transactions of bitcoins may be manipulated, in what's called the "double-spending problem". The "double-spending problem" is the issue of a bitcoin holder spending the same bitcoin but in two separate transactions simultaneously, therefore practically counterfeiting. So bitcoin miners will check transactions using the computing powers of their hardware, inspecting whether a transaction is legitimate and that same bitcoin isn't being used elsewhere.
The miners are then *possibly* rewarded once they have verified at least 1 megabyte worth of transactions. Being successful in cryptocurrency mining isn't guaranteed, since there needs to be a numeric problem that has to be solved to successfully mine the currency by a computer. Therefore it is generally luck based, but having a more advanced computer would increase the computing power, and therefore the "hash rate", which means more numerical problems can be solved increasing the likelihood of successfully mining the coins.

The most common technology that cryptocurrencies are built on is one called blockchain technology. The blockchain, put simply, is a special type of database. Structured in a unique way where it collects information in blocks, chained to earlier filled blocks. This chain of blocks is the database known as the blockchain. This means once a block of data is filled, it cannot be edited or changed (without a majority consensus), and is stamped as a part of the blockchains history.
With cryptocurrencies, the blockchain stores the data of transactions, with all different computers all around the world contributing to the blockchain. This decentralization means there is no single controller of the cryptocurrency, as many different computers need to concur no interference with the blockchain.
The security of the blockchain is likely its greatest asset, as it is important to not compromise the expensive assets of the cryptocurrency holders. Each block has a hash key, and the hashkey of the block before it. This means that if an individual were to attempt to alter or dismantle a block, it would unalign with the rest of the blockchain, and would be seen as illegitimate from the rest of the blockchain.

The impact of the rise of cryptocurrencies has not gone unnoticed. As it has caused a large wealth gain in early investors, along with the potential to revolutionize current currencies. With digital currencies being decentralized, away from government control, it has led it to be the primary form of transaction within online black markets, where anonymity is at utmost priority. Cryptocurrency does have the potential to replace state backed currencies, if adoption of the technology becomes widespread enough. But this wouldn't be without some sort of government intervention, where the ability to trace transactions and each virtual coin will be prevalent. The consequences of a digital currency being adopted as the sole medium of transactions would also come with many negative consequences. Many individuals who

haven’t adopted technology to the fullest extent will almost be excluded from society, financially speaking. As their abilities to make transactions would be non-existent. Many jobs would also be affected, most specifically those who work at the mint. As printing money would instead be replaced with mining coins, if that was the approach to a government-backed cryptocurrency. Also, in a physical sense, the consequences of power outages or possibly even internet outages could be catastrophic financially. As many businesses would fail to make transactions without these necessities.
If this already all sounds somewhat familiar, it’s because we already live in a world where a digital currency is the norm. Despite still having physical currency, the vast majority of us have online banks, where we use a debit/credit card in transactions. The money shown to us on our devices aren’t necessarily there, but rather merely just a number that we can trade for physical currencies. With the deletion of the gold standard, where each dollar was worth a set amount in gold, currencies are merely state-backed.

Blockchain and cryptocurrencies becoming a more mainstream form of transactions won’t necessarily affect the vast majority of people's livelihoods, including mine, who operate most of their finances digitally anyways. But the further development and practical uses of the blockchain database technologies may create pathways for many more practical applications not even thought of yet. Blockchain isn’t just limited to cryptocurrencies, as there are many instances of the blockchain being used as a secure database. Some examples include Mediachain, which is a company operating in the music industry which utilises blockchain to use decentralized and transparent contracts. This was then acquired by Spotify in 2017. Also another company named Propy, a real estate company which uses blockchain technology to instantaneously issue titles within its property marketplace. The uses for blockchain reach way beyond the horizon of merely just cryptocurrencies, and the way companies adopt and use this technology may change our livelihoods forever.

Bibliography:

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