IT Technologies

Blockchain and cryptocurrencies

A Blockchain[1] is the peer-to-peer technology that permits users with a common interest to co-create ledgers of transactions without the need to trust the other parties in the peer-to-peer network or the need to rely on a central authority [2], these ledgers are transparent, unchangeable, and stored as verified copy’s between multiple nodes.

A transaction is finalised into a block not unlike a page in a paper ledger [3], all blocks are chained from the original block to the most recent block creating the ledger timeline. A single party or parties are unable to make an unauthorised change to the ledger due to there being no one central clearing authority who can allow or deny the change, it’s essentially all the users of the peer-to-peer network who authorise adding a block by checking all the previous blocks in the chain, thus changing a block that is already part of the chain is not possible.

Although the name cryptocurrency[10] has the word “currency”, it is better to refer to cryptocurrency as a medium of exchange, this is due to the debate that a currency shouldn’t have intrinsic value, though being a medium of exchange is essentially the same thing. These mediums of exchange use the blockchain technology to validate and legitimise transactions, a person can own cryptocurrency and use it to purchase goods and services privately and securely.

Because cryptocurrency is not regulated, it first found its use by criminals on the internet’s black market, though now many users have come to cryptocurrency for its practicality, speed, and security.

Spotify [5] is a good example of how blockchain technology is used today, Spotify is using a decentralised database to allow artist to be consistent with license agreements and tracks. They are attempting to solve the issues of artist and labels in the industry which are not being fairly acknowledged with blockchains transparency and unchangeable ledgers.

A good example of what could be done soon (and is in development) is with banking[6], currently in order to transfer currency from an Australian bank to another country it requires the money to go through multiple banks with multiple layers of intermediation, taking an undetermined amount of time without a clear ledger of where the money travelled. Blockchain technology can securely move digital assets without the need of these banks or third parties, this also allows financial services access for people who didn’t have this access before and removes many of the transaction and processing fees involved in moving Fiat currency.

Blockchain[7] is made up of the past and current transaction ledgers as ‘blocks’, so, to add a new block, first a miner would attempt to add the transaction(s) as the newest block to the chain. For a miner to be able to achieve this, they must run a full node with the entire transaction data of the blockchain, this data will be compared to data from the other nodes in the peer-to-peer network to verify its legitimacy. Furthermore, the miner must complete an energy intensive mathematical equation using the RAM, CPU, and graphics card of their device while competing with other miners for the right to add the latest transaction to the blockchain. As they are using their energy and hardware (technology with computational power, i.e. computers, phones, servers), Miners are ofttimes incentivised with rewards of cryptocurrency in exchange for performing the tasks which keeps the blockchain maintained.

As these transactions are broadcasted to the peer-to-peer network of nodes, the node’s job is to store, spread, and keep the transaction history of the blockchain data as this forms the infrastructure of the blockchain and is considered the blockchain itself. These nodes use known algorithms to check and verify the transactions and user’s status. Once validated by the nodes, the transaction combines with the previous blocks in the chain, creating a new block that consist of the previous and current transactions and their data. The new block is added to the chain where it can no longer be altered or moved. A node simply acts as a gatekeeper with a directory of the blockchain transaction history, as well as updating other nodes that are coming online or are outdated.

This Technology can be used to create secure communication in hostile environments, there is no need to rely on trust[9] when using a decentralised system like blockchain as it enables every user to have equal privileges. With blockchain technology there is no good or bad, right or wrong, there is only valid or invalid. This is changing some jobs already, for instance; Job’s involved with supply chain’s no longer need an intermediary to process and account all the transactions between a business deal[4], as blockchain is a reliable foolproof record that the ecosystems of business partners can easily adopt. Thus, for some jobs, the impact of this technology has removed the time, effort, and management involved that would require checking ledgers and accounts, as well as making some jobs redundant.

It is hard to say who is likely to be most affected by blockchain technology and cryptocurrency, as this technology is truly not bound by geography it is very possible that the citizens of a country such as Venezuela[8] (Venezuelan’s are currently in an economic crisis) would look to cryptocurrency to bypass their hyperinflated fiat currency as this can act as an alternative payment for goods and services.

Blockchain technology allows businesses to process data faster and more efficiently, sometimes by cutting out the middleman entirely and other times by changing old jobs or even adding new jobs. An example of blockchain creating new jobs could be the role of creating the standardised template for a business to enter their data, data entry, running a node or mining, and even increasing jobs in hardware maintenance.

There are also talks about availability of people’s information, one Forbes article wrote about the permanent storage of customer health data and their identity which will allow health care systems to accurately find your medical history. This can be a major benefit for medical service providers and their customers as it saves time, unfortunately this also creates the debate about privacy, who really controls your health records stored on multitudes of computers, can you delete it?

To the average Australian, blockchain and cryptocurrency will not be a technology they actively know they are using until cryptocurrency and its uses are adopted by businesses and systems that already have their place in society i.e. banks and supermarkets, or until blockchain is used to store citizens data. It may take a while for this technology to be used by a health care system or as a form of in store payment. Personally, I would not want my medical history stored in a capacity that doesn’t allow it to be erased. For some people this could create a roadblock for potential jobs or government forms, If the person is not breaking a law, then they have the right and choice to prevent their private information from the prying eyes of employers and authorities, wishing to keep some specific information ignorant. Private and confidential information will always interest individuals and businesses with malicious intent or greed. If it is possible that personal data can be stored and viewed by others, then who should be allowed to make entries and who should be allowed to view the data? As an example of a potential road this technology might move towards, a previous employer would have all the power over x-employee if they were allowed to leave a employment profile review.

As new technology, Blockchain and Cryptocurrency are not regulated by the government, but laws are always able to be created and laws are able to be changed. In the interest of keeping my family’s private information safe This brings up concern for my family and myself about our privacy. The ability to take advantage of blockchain technology doesn’t provide much difference in my daily life as it hasn’t been adopted by most of the systems that I already use, and if it were adopted, then one way I would use this technology would be to transfer money between my families and my own foreign and Australian bank accounts while I’m traveling abroad.

As an example of the use for us students looking for a career in the IT industry, the ability to create a side project outside of work hours and storing the ongoing documentation in an unchangeable ledger very well may affect some of us. To have unchangeable dated and timed documentation may be very useful to some students who wish to protect their intellectual property against a company that claims they used company time or resources to work on the project.

As a whole, I like the idea of cryptocurrency and how it can improve our lives, and the technology of blockchain for removing the trust involved in business, yet I am weary about the possibilities of a system that has the ability to leak private and confidential information.

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