**Blockchain and Cryptocurrencies**

Blockchain started as a decentralised method of confirming and storing transactions. It based off the premise of a triple entry accounting method. It is a ledger that accurately records all information of a transaction as a block which is shared across a decentralised network. This block is confirmed frequently by multiple sources on this network, making it practically impossible to tamper with. While primarily used for the trade of cryptocurrencies, it’s potential use far extends beyond this.

*Where did it start?*

Traditional banking uses a centralised method to confirm and store transactions, because of this it’s prone to certain vulnerabilities and limitations. While unlikely to happen as an everyday occurrence there is possibility of banks manipulating transactions. There have even been proven cases in the United States of America where banks were caught re-ordering transactions to charge higher overdraft fees. With a centralised and private record of transactions the possibility of corruption is present. The other vulnerability is the security of these records, potentially allowing those with the technical knowledge to digitally alter them with malicious intent. Also, as a centralised method, each bank or network of banks is separate from one another, making the process of transferring money around the world a lengthy one as multiple checks on transactions must occur through separate entities as money moves locations.

Though the concept had been around beforehand the blockchain as we know it was created by a person or persons known as Satoshi Nakamoto in 2008. It was created as way of recording, verifying and publicly storing the transactions of the cryptocurrency Bitcoin. Many claim the creation of Bitcoin by Nakamoto was an anti-establishment move in direct retaliation to the corruption involved with the 2008 Global Financial Crisis, that saw the bankruptcy of Lehman Brothers and government bailouts of many other banks totalling over $700b USD.

The difference with Bitcoin as a currency is the blockchain, a decentralised method of processing and recording transactions. As a transaction is made it is stored in a block, a block can store many transactions, each block contains a marker of the previous block thus forming a “blockchain”. These blocks are stored on a decentralised network of nodes, they are then confirmed by checking against other blocks stored on other nodes. Being decentralised, this means no one owns the blockchain and all information is stored publicly.

So, what is this decentralised network and who is processing these transactions?

Since there are no central servers in blockchain it relies on many computers around the world to process its transactions. This is done using software loaded onto home computers or server clusters, it is known as mining. The process of transacting Bitcoins requires calculations to be solved before being added to block, these calculations require a certain amount of power from a computer and the time it takes to complete a calculation is measured in a hash rate.

What’s in it for miners?

Miners are the backbone of the blockchain, without them there would be no way to store and perform transactions. The more miners there are the more secure the blockchain becomes as it can be verified across even more sources. So, miners are rewarded for completing calculations, each time a calculation is completed a miner receives a fraction of a Bitcoin. This in turn, is what creates more Bitcoins and grows its economy. As the number of miners and currency increase the calculations become harder, thus pushing for more power to complete the task.

Miners compete to process these transactions, it becomes a race for all those involved. This pushes miners to build machines that enable them to have a higher hash rates, allowing them to process calculations quicker, securing a greater income. What first started with multiple CPU configurations quickly turned into multiple GPU setups as the most efficient way to mine. In fact, mining became so lucrative that users from all around the world were moving so fast build machines using upwards of 8 GPUs per setup that graphics card manufactures increased their prices significantly due to supply and demand, much to the distaste of gamers around the world.

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This impact of blockchain will be far reaching for some time to come. Being a decentralised open sourced system, the rise of Bitcoin started an array of many other cryptocurrencies, all adding their own spin on how the blockchain works. The financial sector was rocked hard by the sudden outburst of cryptocurrencies. It changed the way people made transactions online, it created its own economy and made many extremely wealthy. With many countries around the world suffering from devaluing currencies do to inflation, cryptocurrencies have become viable way to safely invest money. It has in fact become so popular that governments around the world have recognised this as a legitimate source of income and begun to tax any gains acquired through its trading.

Financial institutions are also starting to turn to the blockchain technology, embracing is potential and turning away from centralised methods. While these banks are not yet moving completely to a blockchain based system they are implementing it to process smaller transactions, loans or property management. Even in Australia the Commonwealth bank has implemented a trial of a blockchain system known as the Trade-Chain experiment.

Blockchain technology can be used for more than just logging financial transactions. Smart Contracts are an area with incredible potential. They can completely do away with traditional paper-based contracts. With the ability to automate payments based on specific conditions being met using compatible cryptocurrencies, such as Ethereum. A contract could be agreed upon by parties and committed to the blockchain, once this happens it cannot be tampered and there is no risk of loss as just like with regular transactions it is verified and stored by all nodes replicating the blockchain. Smart Contracts could be used in all sorts of ways, from supply chain and distribution to housing contracts, banking loans, and insurance claims.

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It’s likely your information will make it onto a blockchain at some point, perhaps with your records at medical centre or a customer reference management system. One of the most interesting ideas to come out of the blockchain technology is decentralised applications, potentially creating completely private social media networks or messaging platforms as being stored in a blockchain there is no governing body. There are even groups looking to change the internet as we know it, moving towards a decentralised internet using blockchain. As we all know now, privacy of your information is a hot topic and one that affects each and everyone of us. With mega companies such as Facebook and YouTube constantly monitoring your browsing habits and selling off your information to third parties many consider current internet tainted. Companies such as US based Blockstack are well on the path to making a decentralised internet a reality, with 74,000 domains registered on their platform and over 7000 members in their development community they are well on the path achieve their goal.

Whether you’re into finance or not, blockchain will affect us all eventually. Its potential use far outreaches its beginnings as the backbone of the Bitcoin. It’s ability to securely store and verify data integrity with out the need for centralised servers allows this technology to be used for many functions. With the ability to one day decentralise our whole internet, taking the power away from mega corporations and opening it up to further innovation, we’ll all see and feel the effects of blockchain one way or another.