HT BLOCKCHAIN BI-WEEKLY NEWSLETTER

Editor's Note
Date 12th July, 2021
Edition 1, Volume 2

Dear Reader,

The first article of the newsletter was a great success! Thank you for the support! It means a lot to us as it shows us that you at Huston-Tillotson are enthused by fintech and appreciate the work of our writing team.

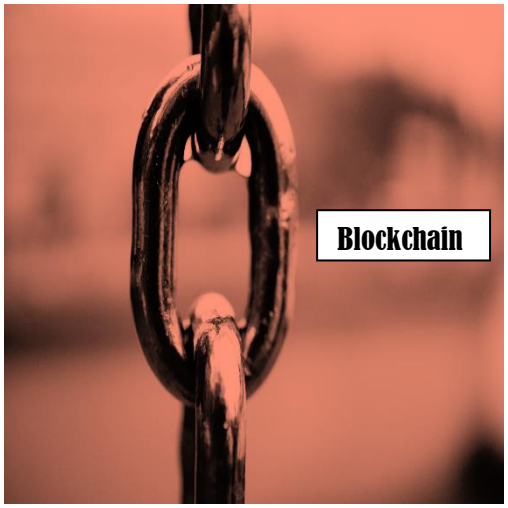
The winner of the first $50 gift card is Ms. Laela Estus. She is an Adult Degree Program Business Administration student. Congratulations Laela! I will contract you with details on how to receive your gift card. If you did not win the gift card this time, you have another opportunity to do so. Just complete the survey at the end of this article (link here).

Is blockchain the same as bitcoin?

In this, our second article, I will introduce you to Blockchain. It is very common for people to equate Blockchain with Bitcoin. However, I hope to show you in this article that Blockchain can stand on its own without Bitcoin. Blockchain is the technology that enables Bitcoin.

Editor:

Dr. Abena Primo from the School of Business & Technology



WHAT IS BLOCKCHAIN?

By Dr. Abena Primo

In this article, I will summarize Blockchain and its issues for you. I hope you enjoy the article. If you have any questions about this article please email me at acprimo@htu.edu.

Blockchain is the underlying infrastructure for cryptocurrencies. It can be referred to as a ledger (just like you find in accounting) or database (like you would find on a computer) for securely recording transactions.

Some of you who may have heard of Blockchain, if I asked you how old blockchain was, your answer would probably be in the range of 10 to 15 years. In other words, you would estimate that Blockchain was as old as the first cryptocurrency-Bitcoin. Blockchain, however, and research related to Blockchain is a lot older than cryptocurrencies like Bitcoin, Litecoin, Ripple, etc.

The concept of a Blockchain originated in the year 1982 from a computer science PhD student called David Chaum. He developed this idea to secure computers on a network. This makes the idea of Blockchain almost 40 years old.

CRYPTOGRAPHY

First, let me explain what cryptography is. Cryptography is a mechanism that allows for secret and secure communications. People often use cryptography to communicate hidden meanings to their friends. For example, the term "Mary Jane" is a street term for marijuana. A person unfamiliar with this street term will not catch the true meaning of the sentence "Where is my Mary Jane?" if the speaker was using the term "Mary Jane" in reference to the drug and not a person.

The high-tech cryptography applied to secure your phone's data etc. does not just substitute English words with other English words though. Instead, it uses mathematical functions to make the original meanings more difficult to follow, hack, or corrupt.

Blockchains have evolved since they were originally proposed in 1982 and are currently used as the primary infrastructure for preventing the hacking of payments while using cryptocurrency tokens.

Blockchains, as they are high-tech cryptography mechanisms, use mathematical functions to make it difficult for hackers to falsify transactions.

A Blockchain is formed from a sequence of many blocks. I like to imagine each block as a being a link in a chain. Each block includes:

1. a transaction record
2. a time record
3. a cryptographic reference to the previous block (if there is one). This item is effectively how the blocks know what they are linked to in the chain.

A key security feature of a Blockchain is that it must be distributed and stored on several computers over a network. Hence, whenever a block is added to one computer's Blockchain, all the other network computers must verify the correctness and update their Blockchains.

PROBLEMS WITH BLOCKCHAINS

Using Blockchain, like any technology, is not without

problems. Below is a list of issues related to Blockchains:

1. The 51% Attack
2. Blockchains are slow
3. Electric and Environmental Costs

The 51% Attack

This is a risk currently foreseen by blockchain researchers for which there have, so far, been no evidence of actually having occurred. Remember, earlier in this article I said that it was important for the Blockchain to be distributed over a network? In this 51% attack scenario, a group is formed that has control of more than 51% of the computers in the Blockchain network. A group this powerful on the network would have the ability to prevent valid transactions from being added to a block or erase previously accepted transaction in the Blockchain.

Blockchains are slow

The cryptography required to secure Blockchains as well as the fact that storage is across several computers makes blockchains slows. In fact, to give you an idea of how slow Blockchains are, using a comparison for payments processing, Visa does approximately 1700 transactions per second on while Bitcoin's blockchain can only process 4.6 per second. This is quite a large difference. Visa while being a popular payments service globally still has poor penetration in many countries. If Bitcoin wants to replace Visa as a payment's processer globally, the processing of blocks needs to become a lot faster.

Electric and Environmental Costs

The computers hosting the Blockchain need to be on most of the time to secure the network. This electric cost is further increased with every transaction added to the Blockchain. Each transaction requires a cryptographic verification process that is computationally expensive and therefore adds to the electric cost. These increased electric costs can lead to environmental costs because electricity is primarily generated by the oil and gas today. The procurement and use of oil and gas have known environmental impacts with respect to climate change.

CONCLUSIONS

Blockchain and Bitcoin are not the same thing. Blockchain is a type of cryptography that is used by cryptocurrencies like Bitcoin, Litecoin, Ripple, etc. to secure transactions. However, the use of blockchains for transaction processing is not without fault. Blockchains are slow, susceptible to the 51% attack, and have electric and environmental costs. Hence, there is still a lot of Blockchain research needed.

Did you enjoy this article? Please let us know by following the link below and completing a short survey about this article. Survey participants will be entered to a draw to receive a $50 gift card. The gift card winner will be announced in this section of the next article.

Survey Link

Previous winner: Ms. Laela Estus

This project was generously sponsored by the FinTech Center at Morgan State University. If you have any questions or concerns, please contact Dr. Abena Primo (email: acprimo@htu.edu).

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