

## BILT "Tiger Team" Meeting Minutes

<b>MEETING DATE:</b> Wed, July 7, 2021	<b>MEETING TIME:</b> 8:30am-9:30am Central	<b>MEETING PLACE:</b> Zoom
<b>RECORDER:</b> Mark Dempsey	<b>RECORDING:</b> Available upon request	

### MEMBERS PRESENT

<b>BILT:</b>	CCN educators:	
Matt Glover, Le-Vel	none	
Vincente D'Ingianni, Raytheon		
CTC staff: Ann Beheler, Mark Dempsey		

### OVERVIEW

Vincente noted that blockchain technology is an "offshoot of cryptography," which is why understanding cryptography is so important to understanding blockchain.

Matt noted several components to a blockchain:

- \* The hash – a "digital fingerprint," the hash is a long series of numbers and letters that identifies what specifically is in the block.
- \* The block – where the data is stored; the block can be anything so long as it's 1s and 0s.
- \* The blockchain – a series of blocks that are synced back to the same hash.
- \* Tokens – track the transactions inside the block to ensure immutability

Vincente likened it to a linklist. Each block is linked to the next block and each block contains a hash of the previous block. Blocks are nothing but ledgers – which is why it works so well with financial transactions. The beauty of the blockchain is that you cannot change any of it without disrupting the entire chain.

### MINING

Mining ensures the blockchain remains intact and has not been manipulated or corrupted. If the chain has been hacked – breaking the blockchain – the hash will change and the "bad block" can be identified and dropped.

Matt explained that "mining" is a way to validate that all of the previous blocks are part of the chain and that the chain is intact. This takes compute power, but the work is spread out among many machines. Rather than pay someone like AWS to run a data center, the work is sent to anyone with compute power to confirm the immutability of the blockchain. It doesn't matter where the data resides. Anyone can help "mine" and validate the data to ensure the blockchain is correct. In return for that work on your "mining rig" PC, you're paid a small "gas fee" in cryptocurrency. Over time, those gas fees add up.

Vincente noted that mining isn't just about validating previous transactions. You're also mining to find new hashes for the next block using complicated algorithms. Creating those new hashes and blocks is not easy. At first, the miners used standard CPUs, but then they realized that GPUs could do the work faster. Even better now are custom ASICs that can work even faster than the GPUs. In sum, "mining rigs" are specialized computers with GPUs or custom ASICs running the blockchain algorithms.

It's a shared workload across many, many machines. Miners will join a mining organization to pool resources and share the work. When the group discovers a new block in the chain, it's rewarded with a portion of cryptocurrency.

Each cryptocurrency has its own unique algorithm and objective. For example, Vincente mines Monero, which was designed to be private. While anyone can look into Bitcoin blocks and see transactions, Monero hides that information.

## **CRYPTOCURRENCY**

The popularity of cryptocurrency like Bitcoin or Ethereum is similar to the Gold Rush of the 1850s. Everyone's looking to get rich. Matt noted, however, that there is more power to blockchain than just cryptocurrency.

Vincente shared a link (<https://youtu.be/bBC-nXj3Ng4>) that explains how Bitcoin works. He said that understanding cryptocurrency at a basic level is a good thing. It's no longer just an emerging trend. Students should be learning about it.

Matt also talked about the concept of "de-fi" – decentralized finance. This concept takes the power of banking away from financial institutions and puts it into the hands of the people. Cryptocurrency lending can deliver much higher interest rates. In part, this is because of the volatility of cryptocurrency.

CoinGecko (<https://www.coingecko.com/en>) provides history of the top 100 cryptocurrency coins over the last twelve months. Most have gone way up. According to Matt's research, only three of the top 100 didn't perform well. Again, this is like the new gold rush.

Both China and US governments are seeing wealth moving out of banks and into online cryptocurrency because of the higher rate of return and, as a result, are taking action to regulate and control that migration. Matt noted that most crypto traffic happens when the US and China are awake.

Vincente noted also that younger generations likely already grasp much of this. His college graduate daughter is mining cryptocurrency. She believes it's a good investment.

He also noted the "darker side" of cryptocurrency. Cryptocurrency fuels drug sales and is the currency of the dark web. This is especially true of something like Monero that prioritizes privacy and resists regulation.

Matt explained that KuCoin ([www.kucoin.com](http://www.kucoin.com)) offers trading bots. Users set up trading parameters to tell the AI bots when to sell or buy. The KuCoin website also displays a list of the best performers in the KuCoin community. You can even use those performers' bots for your own account if you'd like.

Vincente noted the "level of maturity" of the cryptocurrency trading sites is impressive. The software and platform often seem better than his traditional bank website. Matt agreed. To Matt, banks are no longer the leaders. They are slowest to move and innovate. Even so, many of these trading platforms are off-shore. It's not clear where they are. Vincente noted that Coinbase (<https://www.coinbase.com/>) is trying to be "above board" and comply with US regulations.

Matt stated that, as of now, Binance (<https://www.binance.us/en/home>) is the biggest cryptocurrency platform. There's an international version, which is based in China, and also a US version – a division that's mandated by the Fed.

## **BEYOND CRYPTOCURRENCY**

Vincente said that Ethereum is important – as of now it's the second most popular cryptocurrency – because it's used for many more things than just currency. Among other applications, it helps validate electronic contracts.

Matt agreed. He sees a future in which Ethereum can disrupt platforms like AWS and Azure. Rather than pay for those cloud services through Microsoft or Amazon, companies might run their data center in a distributed Ethereum cloud and instead pay thousands of miners for their compute power. This is appealing to business because it prevents someone like AWS from shutting off a platform for non-business reasons.

### **IMPACT ON CURRICULUM**

Ann asked how much we want to add to the entry-level infrastructure KSA list. How far away are we really from seeing blockchain replace traditional data centers?

Vincente and Matt agreed it's far out for now, but this is definitely where IT is headed. Matt did note, however, that the change could be quick when it comes. For example, if someone develops an app that can distribute .net code in a blockchain and then recompile it, he "guarantees" CIOs like him would be interested. Such a change – especially if it didn't require any code rewriting, but could instead send the code through a conversion matrix – could lead to moving everything off of platforms like AWS and into blockchain. The issue for Matt is that it all must be secure. He noted that a lot of startups don't care about security, so they might be the first to embrace this sort of .net blockchain. Only after such an app were secured would larger, more mainstream companies use it.

Matt pointed out that blockchain is both hardware and applications. Those line continues to blur. Blockchain will be a part of cybersecurity, software, and infrastructure. It will be like teaching Microsoft Word – it's everywhere. It can be applied to multiple IT disciplines and jobs.

Vincente stressed going back to the basics: understanding cryptographic algorithms, what they're used for, and how they help create the blocks in a blockchain.