

Meeting #2 Review
March 2, 2022

- Beginning of meeting questions

Question from Wenkai: To build a blockchain application, we don't have a centralized server? Since the whole point of blockchain is to decentralize the server so the nodes can talk to each other directly.

Micheal's Answer: correct

Question from Wenkai: What if we want to store something on the blockchain, we can store the data on the blockchain as well?

Answer: With blockchain because there's so much data you are limited in the payload that you can use. If it's anything of a great length you will use pointers like URLs or something to that. It's how NFTs work right now as well.

The NFT is basically a pointer on the blockchain to some CDN that is basically housing whatever it is, if it's a picture, a movie, what not. You do have some space for metadata within the blockchain to assist you on some of that.

- Professor C. contribution

Professor C. is looking to see what server options are available to us.

- Internal blockchain

To create a real NFT the cost is approaching \$800 to create one NFT. That's why we are going to do something local, internal which is what most developers do. They follow the standard and once ready to make it real, they figure out which blockchain they want to go on.

- TO DO: Look into a couple of different systems that we can download to a desktop or whatnot that can be used to basically fake a local blockchain and be distributed amongst multiple nodes so that we can see that. However, Micheal does not want to get bogged down too much in this. We cannot use a blockchain that is real because the cost associated with it is steep.

By this Monday March 7, 2022, we need to decide which one we are going to use. If not, Micheal is going to recommend one.

- What platform are we going to use?

Michel says it's our decision for which platform we want to use. Micheal suggests an **Ethereum blockchain and a clone**. Each has their pros and cons but Micheal thinks Ethereum is in the lead for the one that is used more often especially with NFTs. It comes down to whichever we think is easiest to create a dev environment.

The program we are going to be called a smart contract and we are going to be creating our own tokens and certifying them.

- Things that are up to us
 - Database

Micheal is leaving which technologies to use up to us to decide. Including the database, even the type of database if we want to use a no SQL database or a Jason Object Store database, or MySQL, it will all be up to us.

- Programming languages
- Methodologies

- 4th actor in the metaverse

☐ TO DO: We still need to figure out the fourth actor we have in the university Donors?

- Limits in reference to the document Micheal sent

There are numbers in the document that can be changed. Micheal just wanted to show us that this isn't wide open. For instance, if you have one professor who can teach physics he **cannot** teach 10,000 students, there's a limit. However, a student can take as many courses as they wish.

- Courses offered

We can come up with a list of courses, it's not a big deal though. Marcos and Micheal will provide a simple list of the available courses.

- Database

We will pull some of the attributes from the database that we need for the database from discussions with stakeholders to figure out what is key information/what we may want to store.

- Types of NFTs

There are a couple of areas where the creation of an NFT is going to be utilized. Agani the NFTs that we are looking at having are non-transferable and non-expiring but we could look into expiring NFT's.

- Non-transferable NFT: For instance, once a professor is certified they can't just give that to anybody. The selling of certifications is not possible because they are non-transferable NFTs.
- Expiring NFT: Let's say Micheal is a book publisher and he has an ebook that libraries wish to give out to their members. The library may get some free versions or they may pay for 5 copies of the book. Now, it'll be possible to give those people an expiring NFT. So that this ebook can be taken and the NFT associated with it will expire in a certain amount of time.

There are all different types of NFTs that Micheal is looking at.

- Limitless type of NFTs we give out

We may decide that as part of the university, the university buys NFTs to adorn their metaverse university. Like buying a sculpture that they could later on sell to another university. **This is not something Micheal expects for us to do, BUT also to realize that we don't want to limit ourselves as to the types of NFTs that we give out.**

- Cryptocurrency

When an NFT is minted, it costs money [minting: terminology used for when a coin is created]. Because it goes out on the blockchain and people have to do all sorts of things to certify it.

The university will need some sort of crypto wallet with some available crypto. The blockchain ledger will keep track of what it's spending but we also need to ensure that we know how much money a university has because they can't create more. We have to research:

1. Is that a blockchain thing?
2. Are those a database thing?

☐ **TO DO: Research what to apply a blockchain or database to.**

- Mixture of both database and blockchain

☐ **For the blockchain stuff, a database will not be needed. BUT** for some of the other things like the university set up, what courses it can do, there may be links to a blockchain. We need to figure out the best way to do it. If we figure out how to do all this on a blockchain, that's our decision. Micheal doesn't want us getting hung up if that is not a feasible solution though. We can use a combination of the blockchain, [which it's a ledger, it's immutable in the sense that you do not delete or change records, things get added and changed only.

Micheal believed we will need a mixture of both. Some sort of database to keep track of stuff because not everything will be requiring a blockchain.

- Is there a limit/capacity to blockchains?

The bitcoin blockchain is very large. It costs a lot of physical energy to keep the blockchain alive and well even when it's distributed across millions of nodes. **Micheal states that he does not know enough** to answer this question. We should all do some research into this question.

- What is considered a node?

A node is any minor that is part of the chain, doing work on behalf of the blockchain. You can have minors running and then you can turn them off. The goal of the blockchain is that it is completely distributed so if a whole bunch of nodes go down it doesn't matter that that blockchain is still alive and well because the rest of the nodes pick up.

☐ **TO DO: Research nodes**

- Relationship between the nodes and bitcoin

You get bitcoins out of it by solving hashes and doing the work. It is very difficult because these hashes take a lot of computing to do the amount of work. You earn your bitcoin by doing work.

The more hashes you compute the better the chances of you getting paid for your work. There are miners out there that have 40-50 containers filled with mining equipment which could be PCs running multiple graphic cards, very specific ASIC miners. There's a number of Bitcoin you get back for the work you do and it halves every time it reaches a certain number of Bitcoin.

Minutes

- Research different systems that we can download to a desktop that can be used to fake a local blockchain and be distributed amongst multiple nodes
- Discuss how to implement blockchain and database.
- Research nodes
- For the blockchain stuff, a database will not be needed.