BLOCKCHAIN TECHNOLOGY: TRENDING UPWARD

By

LUKE ROZNOVSKY

Oklahoma State University

Stillwater, Oklahoma

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ABSTRACT

Blockchain technology has slowly become a more and more popular term being tossed around in the technological world. It is a very versatile area of technology that has yet to be used to its full potential. Despite its complexity and it's relatively short thirty years of existence, it has made quite the impact on a multitude of unexpected areas, including banking, produce, and many more. It is without a doubt impressive how much impact this technology has had on the world today. But, as time goes on, can this technology continue to grow, and can it realistically be used on a larger scale?

This is exactly the question this thesis attempts to answer. In order to do so, this writing will first discuss the basics of blockchain and its functionality, and will get the reader up to speed on how it works. The writing will then move into the real world uses of this technology, and discuss how entities such as Bitcoin and Walmart use this technology in their day-to-day operations and transactions. Next, the experiment that was done in response to the question at hand will be discussed in detail, including the development and problems involved. After the experiment is discussed, the results will be reviewed and analyzed. Finally, a conclusion and answer to the question will be given at the finish.

A BRIEF INTRODUCTION

Blockchain is a very versatile area of technology that has yet to be used to its full potential. Despite its complexity and it's relatively short thirty years of existence, it has made quite the impact on a multitude of unexpected areas, including banking, produce, and many more. It is without a doubt impressive how much impact this technology has had on the world today. But, realistically, can it continue to grow, and further be used on a larger scale? This is precisely the question that will be addressed by this thesis.

In today's world, blockchain, cryptocurrency and similar areas are all the rage. These terms are being thrown around every day, but there may be some who have heard these terms used in conversation, but are not quite sure what's going on. There also may be those who have never even heard of the term "blockchain." Regardless of familiarity, this writing will cover the basics and get the reader up to speed regardless of the level of knowledge possessed.

This thesis will begin by explaining the basics of blockchain, including the underlying mechanisms and functionality of the technology. Following this explanation, uses in today's world, cryptocurrency and otherwise, will be explored in detail. Next, the experiment involving a basic social network created by the author will be discussed. This network was created in order to aid in answering the question of whether blockchain technology truly can be used on a larger scale. In order to help answer this question, ten human subjects were selected to test and use the site. This process will be explained in detail at a later point in this writing. Finally, the primary question discussed in the first paragraph of will be answered in the conclusion section. So, to begin, the basics of blockchain are explained beginning on the next page.

Blockchain technology has become more and more common in today's world. From product tracking for grocery stores to the exchanging of cryptocurrency, it has grown on a massive scale and will continue to do so for a substantial amount of time. So, how exactly does it work? In the article "How does blockchain work in 7 steps – A clear and simple explanation.", Jimi S. does a fantastic job of summarizing the true basics of blockchain technology. To begin, he describes a blockchain as "a digital concept to store data." (Jimi S.) Essentially, a blockchain can be thought of rather literally; it can be conceptualized as a chain of blocks. Each of these blocks is responsible for storing a piece of data, whether it be a transaction (for example, a contract deployment in Ethereum Wallet) or a transfer of funds (Bitcoin uses blockchain technology extensively). On top of this data, there is also a signature assigned to each block. This signature is created by a process called "hashing." Essentially, the signature is generated by putting a specific string of data into a hash function, which Jimi S. describes as "a very complicated formula that takes any string of input and turns it into a unique 64-digit string of output." This process could certainly take up an entire section of its own in this thesis, but for now, it will be set aside. Moving forward, this aforementioned signature is stored in two important locations. First, it is stored in the block itself, acting as a representative of the most current data. Second, this signature is also stored in the next block to which the current one is chained. The reasons for this are twofold; to begin, this practically serves as the chain itself, and tells the second block (the one storing the signature of the previous block in the aforementioned example) that it is chained to a previous block. Second, and most importantly, this serves as a secure validation of events. If *any* piece of data within a block is changed, the signature will change. Therefore, the new signature of the data and the previous signature of the data – which, as mentioned earlier, is stored in the following block in the chain – do not match. This will raise

a red flag within the chain, and it will be rather clear that there is an issue. This concept –

formally known as immutability – is an integral part of blockchain technology, and is part of

what makes this system incredibly reliable and secure. Now, it is important to note here that the

blockchain is not *completely* immutable. The word immutable is used to describe things that

physically cannot be changed. Data in a blockchain can be changed, but if data is modified

within a block, the entire chain will be ruined and it will be noticeable if data has been altered.

This is what makes the blockchain as secure as it is. So, when using the term immutability, it is

used in the sense that if data is changed, it will be remarkably clear, and in turn makes the

blockchain secure. Now, back into the basics of blockchain. After these signatures are generated,

they need to be approved, or qualified, by an individual filling the role of a "miner." In the most

basic sense, miners are responsible for validating transactions on a blockchain. In the case of

Bitcoin, which will be discussed later, the miners use an incredibly large amount of

computational power to solve complex mathematical problems. These problems must be solved

in order to validate a block. Once the block is validated, these miners are rewarded with Bitcoin.

After the blocks are validated, the process is complete! With these basic steps consistently

repeating themselves, the blockchain can continue to grow. Once again, the article mentioned at

the beginning of this section does a fantastic job explaining this entire process, and is certainly

worth the read. The technology described briefly above has a massive potential for use in the

world today, and there are many capabilities which are yet to be discovered.

TODAY'S USES

So, the concepts have been introduced and the functionality has been discussed. Now, where is it used within today's world? As mentioned in the section "A Brief Introduction", there are many areas in which blockchain technology is used extensively. One of these areas is within the produce business, and a prime example of how blockchain is used within the produce industry comes from an industry leader in Walmart. Each store serves as a destination where one can obtain multiple items, but the most important (especially to college students) is that of food. As with any supplier of food products – whether it be restaurants, grocery stores or other establishments – the original products need to be obtained from various locations, farms or otherwise. In the particular case of Walmart, the sheer number of locations, along with their geographical reach, makes the supplying of food to all of their sites an incredibly complex and intricate process. With the help of blockchain technology, this process can be simplified and improved.

In the article "The Impact of Blockchain on Food Supply Chain: The Case of Walmart," four authors take a closer look at how blockchain has helped Walmart become an even more efficient corporation. Furthermore, they take a closer look at something called the "Food Supply Chain" (as the title suggests). The authors define this as "a complex chain including financial flow, goods glow and information flow, which involves all collaborative enterprises from raw material suppliers, manufacturers, logistics parties, wholesalers, retailers, and consumers." (Tan, Yan, Chen, Liu, 168) The authors also take a closer look at something called "traceability," which they define as "recorded identifications as providing products information (for example, originality, components and locations) to the parties in the supply chain." (Tan et al.168) Essentially, it is incredibly important for Walmart to be able to ensure that all of the food and

similar goods that they transport from place to place are safe, clean, and properly taken care of. With the use of blockchain, they are able to do so in a rather efficient manner. One of the primary example of this is their "Smart Package" system, which is able to "track detailed information of parcels such as package contents, environmental conditions, and location, and an electrical grid that will be powered by Bitcoin or other digital currencies." (Tan et al. 169) With this information readily accessible by the company, they are once again able to effectively and accurately track what is going on with whatever product they may be purchasing or transporting. A second example of Walmart putting these structures into action came in the year 2016, when they teamed up with IBM to "ensure food safety, improve recall speed, maintain good reputation among consumers and also reduce cost." (Tan et. al 169) One fascinating aspect of these advances with blockchain technology by this massive company was their willingness to partner with other large corporations that had already begun using these capabilities extensively.

Since Walmart uses blockchain for these inventions, there are multiple advantages. The first is that this information cannot be tampered with (as discussed earlier, the information is immutable!). Since it cannot be tampered with, the information is known to be both trusted and accurate. Second, it still remains public, and whoever needs to observe it can do so easily. Finally, it is able to increase efficiency through the capturing of real-time data.

Now, one important point that must be discussed here is the difference between a "public blockchain" and a "corporate blockchain." When discussing a public blockchain, the transactions can be viewed by the public, and they can be accessed in a fairly easy manner. But, when it comes to the corporate blockchain category, these records are not easily accessible by any stretch of the imagination. There are a select few that have access to these records, and in turn there are few that can see them. This can potentially pose a bit of a problem in the area of accountability,

as these select few can manipulate the records that get put into the chain. So, this is important to keep in mind as this discussion of companies such as Walmart continues onward.

While these aforementioned benefits for Walmart are of course important, the corporation itself is not the only entity reaping the rewards of this technological use. The customers themselves (including the aforementioned college students of Stillwater, Oklahoma) also benefit heavily. For instance, they can be incredibly optimistic that their food was safely handled, as this system heavily reduces food safety issues. Customers can take solace in the security and reliability of this system, and furthermore that Walmart is taking the proper steps to ensure food safety and quality.

So, that wraps up one example of how blockchain is used within the real world. Earlier, this writing discussed the idea of Bitcoin and plenty of other virtual currencies use blockchain technology for exchanges, purchases and more. The biggest advantage of using blockchain with Bitcoin is that there is no need for a third party such as a bank. With no third party to get in the middle, transactions can be completed in a much faster manner, with the security of the transaction remaining intact. As a result of this advantage, multiple governments around the world are not a huge fan of cryptocurrencies using this technology. Regardless of who is a fan and who isn't, blockchain fits in well with cryptocurrencies. To dive deeper into how cryptocurrencies use blockchain, Bitcoin will be looked at in detail in the upcoming section.

Bitcoin was theorized and created by the mysterious Satoshi Nakamoto. It is unclear whether this person is real, or if it is in fact an anonymous identity for an individual, or even a group of people. Regardless of the true identity, Nakamoto's goal was to "create a decentralized, immutable payment technology, free of double spending and providing privacy and anonymity to the users thereof" (Swammy). He was also inspired – or more accurately, annoyed – by the slow

transaction speed with banks. As discussed before, the removal of a third party such as a bank can increase greatly the speed of cryptocurrency transactions while the security of the transaction remains intact. The idea for Bitcoin began when the mysterious Nakamoto posted an essay called "Bitcoin P2P e-cash paper," in which he "described the fundamental details for a new currency." (Pagliery) Nakamoto had a rough idea of how the system would work, and it involved a heavy amount of blockchain. The way he described the basic foundations of this system quite closely resemble the description given earlier in this report. To begin, the system would be based on blocks, which would "house publicly viewable information about recent transactions." (Pagliery) These blocks would then need to be solved by bitcoin miners. As discussed before, the responsibility of miners is to solve complex, mathematical problems in order to verify that a block belongs on the blockchain. By solving these block puzzles, they would be rewarded with currency, and the block "would produce a unique code, or hash, that formed the foundation for the next block." This quick description beautifully fits the mold of the quick synopsis given in the introduction, but there are a few key components that made the system of Bitcoin unlike any other. To begin, this mining process yielded true reward for those who completed these hashing puzzles. Anyone can take on this role of a miner, and their computer can serve as a "node" that can verify the many transactions that happen within the blockchain network. It costs a fair amount of electricity and computational power, and not all individuals can take on this responsibility. But, those who do are rewarded Bitcoin, which presents an incentive for those who take on this daunting task, and therefore induces more transactions. Secondly, these digital wallets that stored this currency would be anonymous. While each transaction would indeed be recorded publicly, this lack of naming still gives a much larger amount of privacy than other methods. One interesting advantage that this system would offers isn't necessarily technological,

but rather financial. "Without financial institutions taking a cut, it would be easier for people to make small, casual payments to one another." (Pagliery) All of these advantages and technological benefits are the reason things such as Bitcoin have continued to stick around today.

That wraps up the discussion of some examples of blockchain technology being used in the real world. This is an important foundation for the later section in which the initial question which this thesis is based on will be answered. But, before that, it's time to delve into the basic social network that was created to work towards answering this question.

QUICKFLOW: A BASIC OVERVIEW

To be quite honest, one of the hardest parts of creating this website was thinking of a name. After a great deal of thought of consideration, QuickFlow ended up being the final choice for the name of the site. So, what exactly is this site, and how does it run? Essentially, this is an incredibly basic social network that uses Ethereum, which is a blockchain that uses the virtual currency Ether, abbreviated as ETH. It also uses the Ropsten Test Network, which uses fake Ether and serves as a source for developing and testing. A screenshot of the site is shown below:
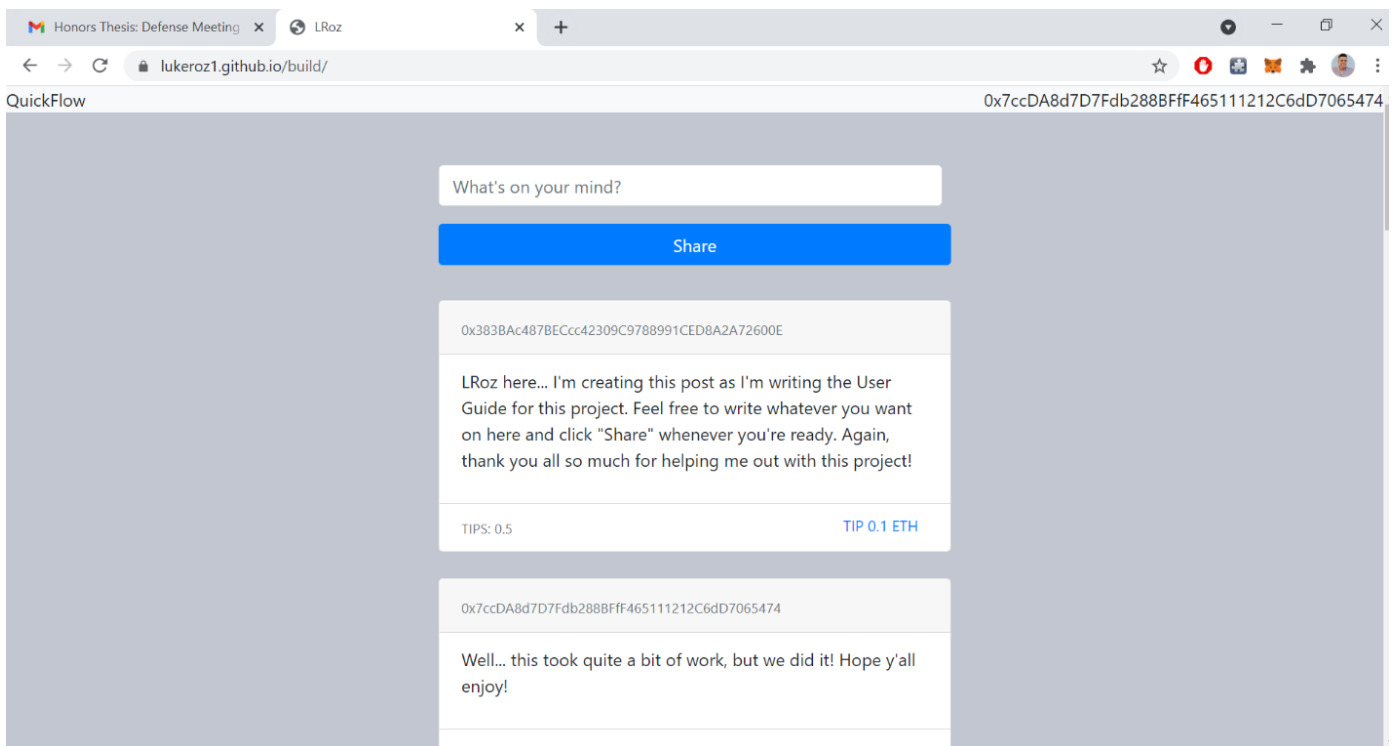
When the user first arrives on the site and gets their virtual wallet connected (this will be explained a little bit later), the site allows the user to write within a text box at the top of the page. Whenever they are ready to post their content, they can click the share button and spend a rather small amount of Ether to migrate their post onto the blockchain, and further onto the site. After the post makes it onto the network, it is displayed on the front page for the public to see.

So, how is it different than a social network like Twitter? Well, once a post is created and it is on the page, other users of the social network have the ability to "tip" the post! So, if a user likes the content of the post, they can tip a little bit of virtual currency (0.1 ETH to be exact) to reward the post creator for creating good content. As the post receives more tips, it rises more towards the top of the page, which also serves as a bit of a reward for the user creating good content! The site can be visited at https://lukeroz1.github.io/build. Please note that to use the site and view the posts, the user must follow the setup instructions that the subjects of this experiment had to perform at the beginning. These instructions can be found in Appendix A.

So, there is no doubt that the site gets the job done, but there are, of course, improvements to be made. This will be discussed later in this thesis, specifically in the future improvements section. But, before diving into the things that could be improved, the logistics of building the site will first be discussed.

It is recommended that the reader check out the tutorial written/recorded by Dapp University, which gives an in-depth tutorial on how to make a social network such as the one that was created for this project. Of course, there were adjustments that had to be made, either because he started by giving the user way too much code or because he didn't explain how to do a particular section of the entire build, but the tutorial was absolutely crucial to the building of this project. It can be found at https://youtu.be/nvw27RCTaEw, and it is also included it in the References section of this thesis. I would also like to point out that I wrote all of the necessary code for this project. The tutorial allowed users to download a "starter pack", which included just about all the code necessary, but, as instructed by the advisor for this thesis, Dr. Mayfield, the code was all written by the thesis author.

So, here's a quick overview of how the code works. This project was written in three programming languages. The first two – HTML and Javascript – are quite common, and are often used in web development. The third language goes by the name of Solidity, which is the language used when developing with blockchain. This code that is used in Solidity is used to write what are called smart contracts. A smart contract is simply defined as a "collection of code (its functions) and data (its state) that resides at a specific address" on a blockchain (Solidity Documentation). So, for this project, a smart contract was written, and was designed to store all required information for a post, and also has the capability to create posts and tip posts. After the contract was complete, it was deployed to the Ropsten Test Network, which would allow the website to connect with the network and use the aforementioned "collection of code" that was deployed to the blockchain on that network. This, of course, was only the first step to the entire project coming together. The other crucial part of this project was written in Javascript. The primary file of App.js contains code that is responsible for connecting to MetaMask (this will be covered shortly), loading the contract from the Ropsten Test Network blockchain, calling the proper functions to create the post and tip the post, and properly display each post on the website. It also calls on a number of methods from another file, and in turn slightly alters the look of the front page. It is the driver for the entirety of this project, and is a very important component. The final component is, of course, HTML. This is responsible for things showing up on the actual page that the user sees. Essentially, after all the proper Javascript had been written, and once the file in which everything needed to be bundled was specified , Node.js (a Javascript library) provided a command which allows the user to bundle all of their scripts and code into one HTML file, and then run this file on a webpage. After this bundling into one HTML file, HTML page was posted onto a GitHub domain, and thus the site was published. The finished

product still sits at the same address today. Again, it must be stated that if the user wants to take

a look at the site, they must follow the setup instructions that are listed in Appendix A. If the

reader would like to know any more about the code that was written for this project, they can

reach out to the writer directly.

THE TWO WEEK TRIAL

The development and publishing of the site was only the beginning. The next step was to have ten individuals try out the site for themselves and see exactly how it worked. These individuals were recruited for a two week test period and were asked to follow a specific user manual, which can be found in Appendix A. So, refocusing back to what each user was doing, the first step involved installing MetaMask, which serves as a virtual wallet to store cryptocurrency. Next, after each user had their wallet, they would travel to a "faucet", which would allow them to obtain the aforementioned fake virtual currency from the Ropsten Test Network. Finally, after gathering this currency, they could travel to the infamous https://lukeroz1.github.io/build, connect to the Ropsten Test Network when prompted, and use the website. The experiment did turn out to be quite a success, but this success of course did not come without its fair share of issues.

One of the first issues that came up was deploying the smart contract to the blockchain. For testing purposes, a Ganache private blockchain was run on a local machine. It was assumed that other users would be able to use this private blockchain, but this was absolutely incorrect. This issue took a day or two of researching, and the code further took a bit of rewriting and revising. After this revision, it was decided the best way to go was to deploy the smart contract to a test network, and in that way everybody could properly connect to both the site and the test network. After this was fixed, the ten subjects were ready to give the site a run. Not twenty minutes after releasing the user manual and instructions, two emails were sent to the author of the experiment regarding a faucet error. For some reason, whenever the subjects would request Ether from the faucet, their accounts would not be filled. Thankfully, this was an easy fix, as the users could simply navigate towards another faucet to obtain currency. Perhaps the biggest issue

across this entire project was user impatience. A few separate users reached out and stated that after either requesting currency or making a post, they did not see immediate results, and would reach out to the author stating that there was an issue with the site. Then, thirty or so seconds later, they would realize their mistake, and the site would be running just fine. This impatience brings up a few important discussion points. First off, yes, this site could absolutely be quicker than what it is now. Having the user wait thirty seconds to see their post pop up was less than ideal, but it seemed as if it was inevitable. But, this also brings up the point that today's individuals that go online are looking for instant gratification. If they have to wait more than 5 seconds, they're going to think that something may be going wrong. However small this issue may be, it is an incredibly important factor when considering software/technology development, blockchain or otherwise. A final discussion point from this topic of user impatience is that users can be unpredictable. No matter how many times code is tested or how clear one thinks the instructions are, there will almost certainly be issues, no matter how small or large the sample size. That's a simple truth when it comes to computer science and programming. Now, these were the main categories that the errors fell into. After this two week trial was over, a survey was sent out to the participants to gather their thoughts on how they thought the experiment went.

FINAL SURVEY RESULTS

After the experiment had finished, a final survey was sent out to all the participants. The survey included questions about their likes/dislikes regarding the site, their suggestions that they would make to improve the site, and whether they could see a site like this being implemented on a larger scale. This survey can be found in Appendix B. Not all users were able to submit a final survey by the end of this project. This is rather understandable, as students are currently being bombarded with multiple requests for organizational surveys, course evaluations, and more. Even without these few responses, the surveys produced some incredibly great answers and results.

Beginning with the overall likes and dislikes of the site, the answers were fairly simple. By far the most popular aspect of the site was the tipping aspect. One specific observation from the surveys mentioned that the tipping concept was unique compared to other social networking sites. Other sites have things such as likes or favorites, but these tips can serve as a great way to reward the user for creating a post that holds great content! This was the idea of the site, and was also the philosophy behind listing the posts with the most tips at the top of the page. Another positive that was mentioned was that the anonymity maintained on the site was incredibly neat. Since the users were identified by an Ethereum address – which is simply a string of letters and numbers representing the virtual wallet where virtual currency is kept – the users did not have their identity revealed in any way. Some may argue that this is a disadvantage, but others seemed to enjoy it in this small project scope. Now, regarding disadvantages, there were a number of things pointed out that were fantastic observations. For instance, one thing that was pointed out was that the site was a bit bland. The look of the site was not the primary focus of the project. Rather, the primary objective was making sure the functionality of the site was intact. But, if this

were to be implemented on a larger scale, design would be a massive factor. Far fewer people are going to look at or stay on the site if it is not appealing to the eye. Another point that was brought up by multiple parties was that the setup was a bit tedious and confusing at times. This criticism absolutely has traction, as getting a wallet set up, filling it with fake virtual currency using the Ropsten Test Network, and making a post on a site a user have never visited with technology they haven't used much of is a bit of a daunting task. But, perhaps down the road if a larger percentage of the general population is using virtual currency, they will not have to undergo such an involved process, and will simply be able to jump onto the site and use the currency that they have gathered. Perhaps the most interesting improvement suggestion that the users gave was that the price to like and tip could be increased, as it really didn't feel like it was a significant amount of money to be giving up. This lack of value of tips could potentially lead to users being less selective with what they tip, and could in turn lead to less separation of the good content from the mediocre, or even subpar posts. Of course, there are a few more criticisms and compliments about the site that could be delved into, but that is not the primary focus of the thesis. Rather, these suggestions can be resourcefully used in the discussion of future improvements that can be made to the site, and further if making these future improvements could help making larger-scale sites such as this one a reality.

FUTURE IMPROVEMENTS

Going into the final stages of this thesis project, there were a multitude of areas that could be improved on this site, and would absolutely need to be improved if this were to be implemented on a larger scale. To begin, one improvement that could be made came straight from the thesis director Dr. Blayne Mayfield. As this project was still in its development stages, Dr. Mayfield suggested that adding the ability to post pictures would be beneficial. This would add variety to the posts, and would give users far more options and variety when it comes to creating content with a personal touch. Another thing that certainly could have been added during the development stages was a little bit more style and a fresher look. This could include a more vibrant color scheme, more pages (such as an about page, pages containing popular posts or posts about certain topics, and more), and a page where a user could customize their profile. Building off of this point, a page where the user could customize their profile to give it a more personal touch could potentially attract more users to the site. So, these were things that could clearly be made better going in. But, the project was released to the experimenters and the experimenters submitted feedback, it was clear that there the creator had far more work to do if this were to become a large scale project.

One of the first and most important things that could be improved down the line is the efficiency of the site. As previously mentioned, there were multiple people who thought they were encountering issues with the site, but as it turned out, they just needed to wait a little bit to see the results. This patience issue reared its ugly head in two main areas, which included the requesting of ether from a faucet and the posting itself. It did take quite a while to both see ether appear in your wallet, and it also took some time for the posts to appear on the page once the "create post" button was clicked (roughly thirty seconds). This could absolutely be improved,

and could easily be considered a required modification if this were to be presented to a larger user base. Another improvement that could be made is in the area of tipping. As mentioned before, a participant stated that increasing the price for tipping could encourage users to be more selective with their tipping. While the minimum tip amount could absolutely be raised, another feature that could be added is the ability for the user to select exactly how much they're tipping. For instance, there could be a miniature dropdown that could stem from the tipping button that could give the user three or four options of amounts to tip the post with. This would give the user more flexibility, while simultaneously continuing to encourage them to be less generous with where they place their tips. Another survey suggested that there could be a timestamp on each post. This would allow each user to see when posts were created, and either get an idea of what has posted since they last visited, or see how things have developed over time if this is their first time visiting the site. A final suggestion from the surveys stated that it would be beneficial if users were able to directly comment on other users' posts. This feature would allow for a wide variety of avenues for users to pursue on the site, whether it be discussing what the user posted, giving them a direct compliment about the content (aside from the tip of course) and simply interacting with friends, family, or colleagues. This would also give the users a greater variety of options when it comes to actually posting, as they could ask other questions or start discussions in anticipation of finding an answer or discovering someone they can consult about whatever it is they may be curious about. So, with all of these suggestions in mind, along with everything that has been discussed in this thesis, it is time to move onto the main idea in question.

FINAL THOUGHTS AND CONCLUSION

So, this all comes back to the primary question that was brought up at the beginning of this thesis: Can blockchain be used on a larger scale as it continues to develop and grow? This question was asked in the surveys to get some other opinions, and after reading these, doing the research of current capabilities, and giving it some thought, the author believes that applications using blockchain technology, such as the one coded for this thesis, can be used on a much larger scale. It has a wide variety of uses already, as explored in both the cases of Bitcoin and Walmart. There are also more uses that were not discussed in this thesis, such as IBM's offered blockchain services. As a matter of fact, the company is currently using a COVID-19 vaccine distribution network which is powered by IBM blockchain. The sheer fact that companies as large as IBM are offering and using blockchain services demonstrates the trust and belief in the potential of the blockchain within the corporate world. The development of this technology may not be a welcome sight to entities such as banks, but other players such as IBM are continuing to help and support the growth of blockchain. On top of these real world uses, both the subjects and the author of this study believe that a site such as QuickFlow could be implemented on a larger scale, with the future improvements mentioned above of course. A site that rewards users with cryptocurrency for good content holds quite a bit of potential, and it could certainly be used somewhere down the road. Another great point in favor of this was made in a survey answer. The participant stated that a site such as QuickFlow could potentially be a perfect way to create an ad-free environment, as a small percentage of the tips given on the site could go to maintain the site itself, with the majority of the currency still going to the users that create posts. This ad-

free environment could be another attractive factor for a site such as the one that was created for this project.

So, the short answer to this question? Yes, there is massive potential for this technology to be used on a much larger scale than it is today. The author is happy to answer questions about anything discussed in this thesis.

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APPENDIX A: BRIEF USER'S GUIDE

Hello! Thank you so much again for agreeing to participate in this study! Just as a reminder of what exactly is going on here, you'll be using a super basic social network that I made using blockchain technology! I'll spare you the details of how exactly this works, but if you are curious about learning more, please do feel free to let me know and I'd be happy to explain!

So, here's the plan. Starting on Monday, March 15th, I will let the ten people that I have selected start using the blockchain social network. There is a little bit of a setup involved, which I will explain here soon, but it shouldn't take more than ten to fifteen minutes to get yourself set up. After you are set up, you're free to make as many posts on the network as you would like! I'm only asking you to make a minimum of one, but again, it is up to you if you would like to make more.

Now, onto the setup. Just as a heads up, you'll need to install one extension in Google Chrome, Firefox or Edge. If any of the following steps don't work, or you have any trouble knowing exactly what I'm trying to say, please do feel free to let me know! You can send me an email at lroznov@okstate.edu, and I should be able to respond in a rather quick manner. Enjoy!

Setup

This will involve installing the extension MetaMask. This serves as a wallet that keeps track of your virtual currency! We will be filling ours with fake currency, so it won't be worth any real money.

1. Navigate the Chrome Web Store. I'd strongly recommend using Chrome, Firefox or Edge to test out my social network (I'm not 100% sure other browsers will work, but you're free to give it a shot if you'd like).
2. Once you get to the store, go ahead and search for "MetaMask"
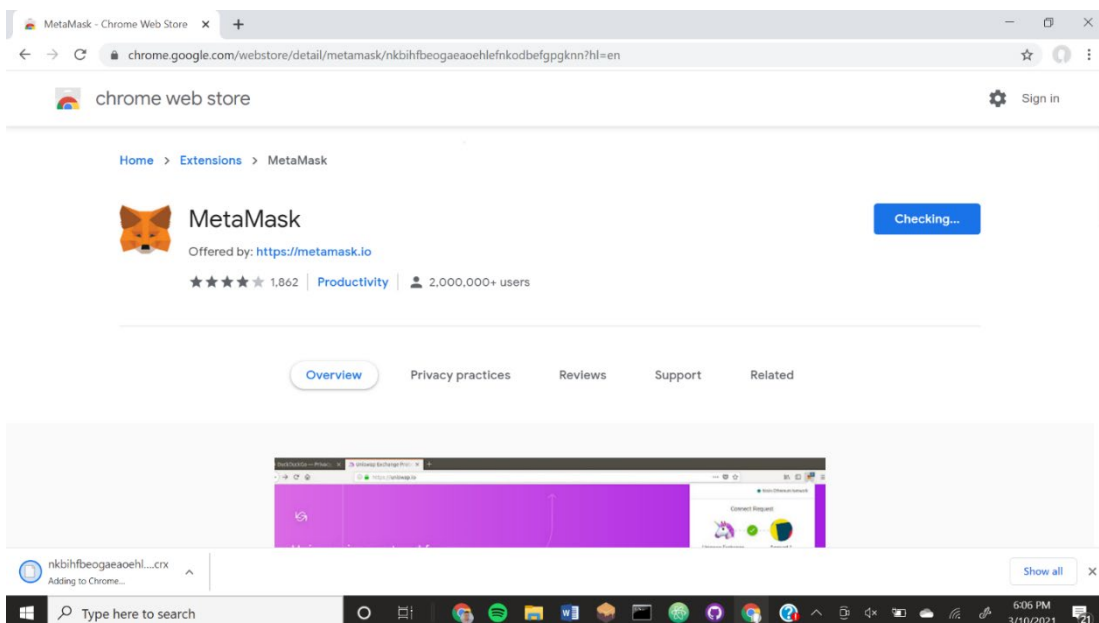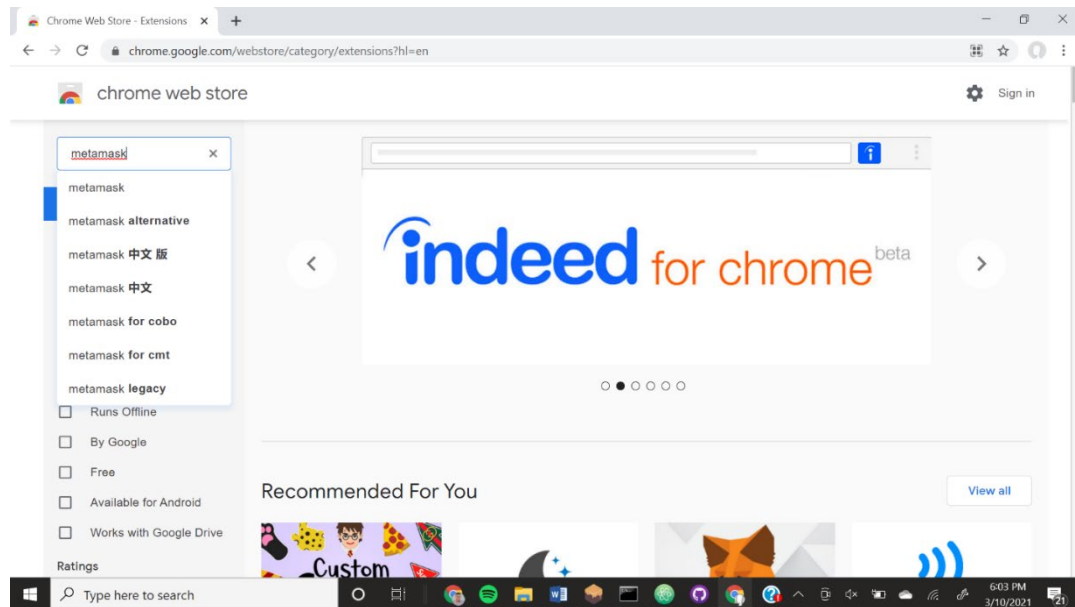
3. Go ahead and add this extension to Chrome. After doing so, you should be presented with a picture like this. Click "Get Started"
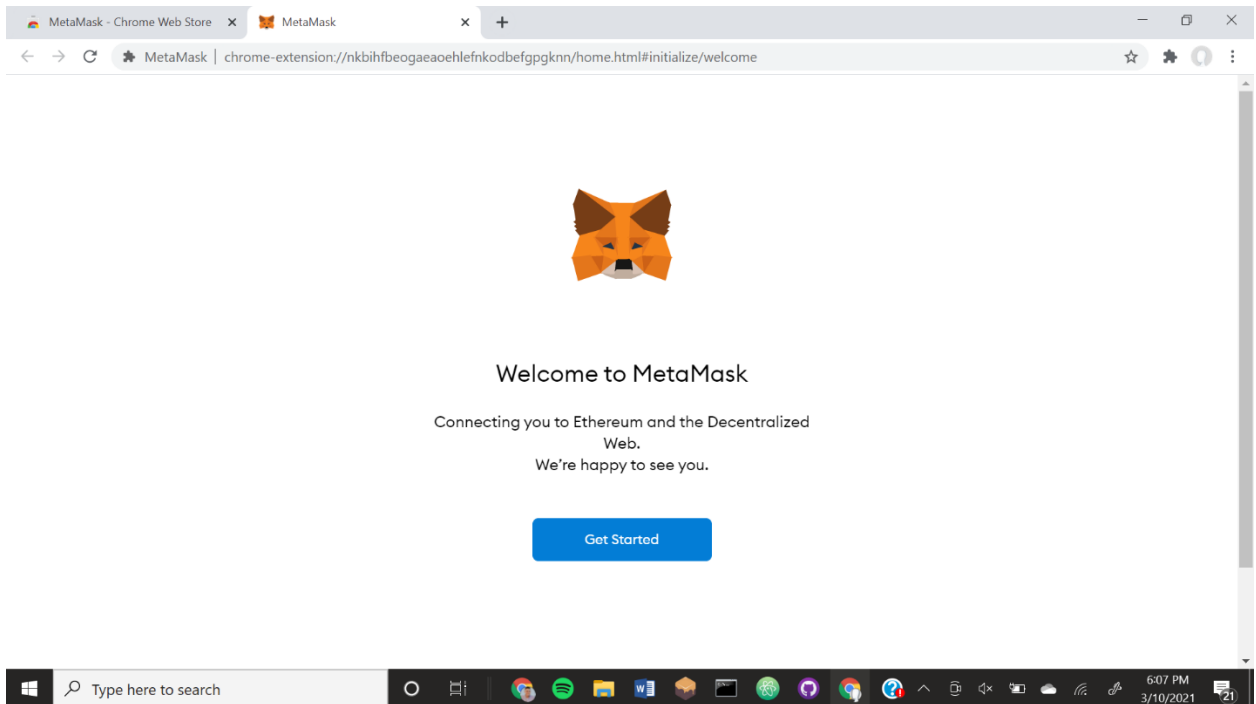

4. You should be presented with the two options of "Import Wallet" and "Create Wallet". Go ahead and click "Create Wallet"
5. Click "I Agree" on the next screen
6. Go ahead and set a password for yourself
7. You will be presented with a "Secret Backup Phrase." Go ahead and save this somewhere, as you will be asked to put the words in order in the next step.
8. Go ahead and put the "Secret Backup Phrase" in order.
9. And voila! You are all set with Metamask! You should have a screen that looks like so when you are done
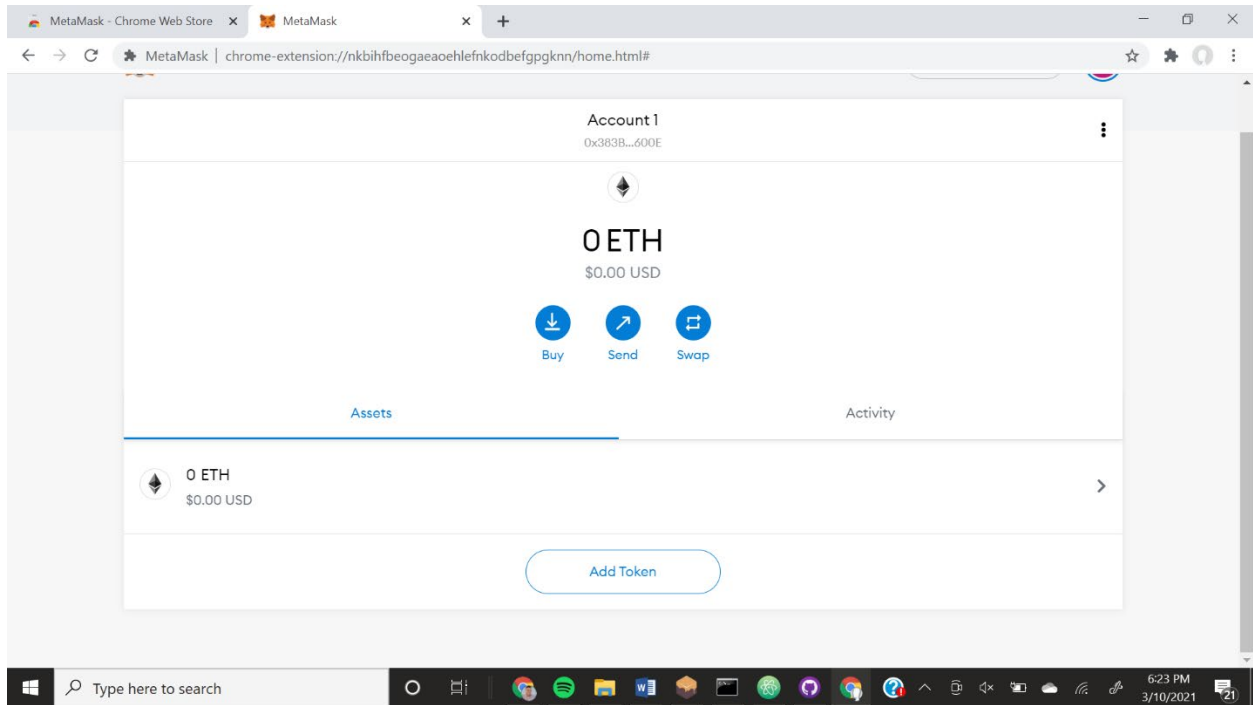
10. You're doing great so far! Before we go any further, make sure to switch your network in the top right to "Ropsten Test Network"
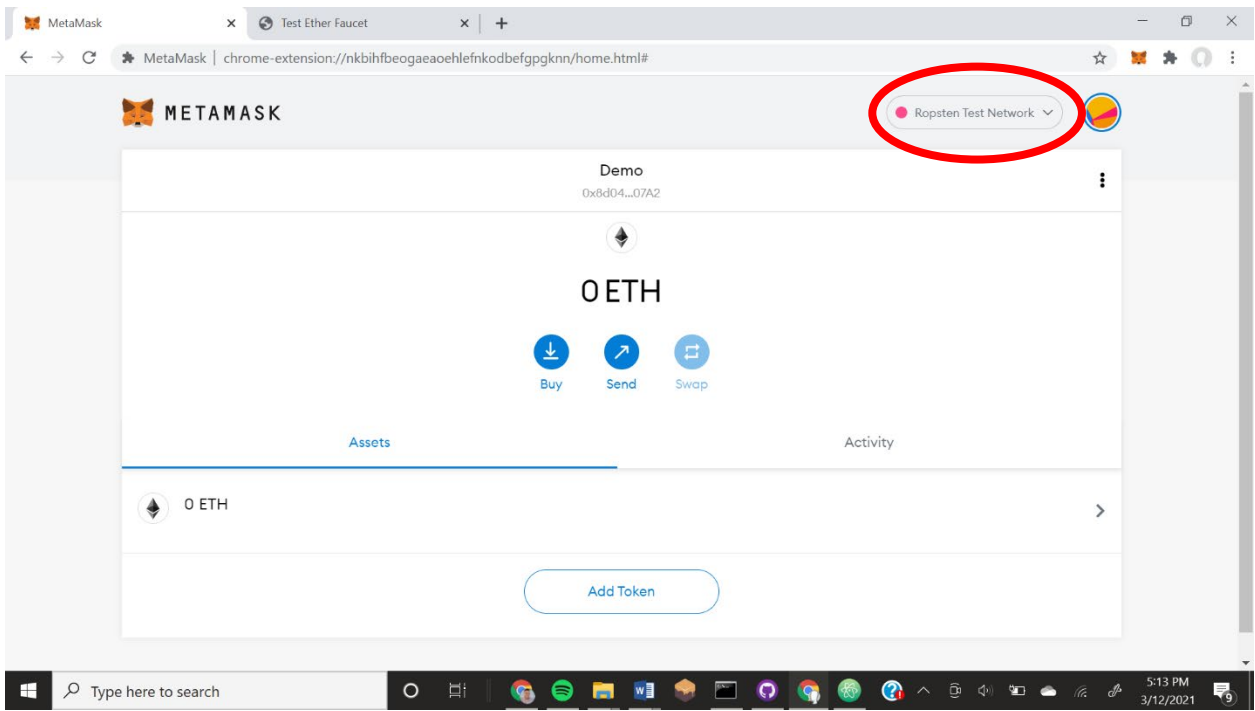
11. The next step is for us to get some currency into our wallet. Go ahead and navigate to https://faucet.metamask.io/

12. Go ahead and click that big green button that says "Request 1 ether from faucet." MetaMask should pop up on the side like so
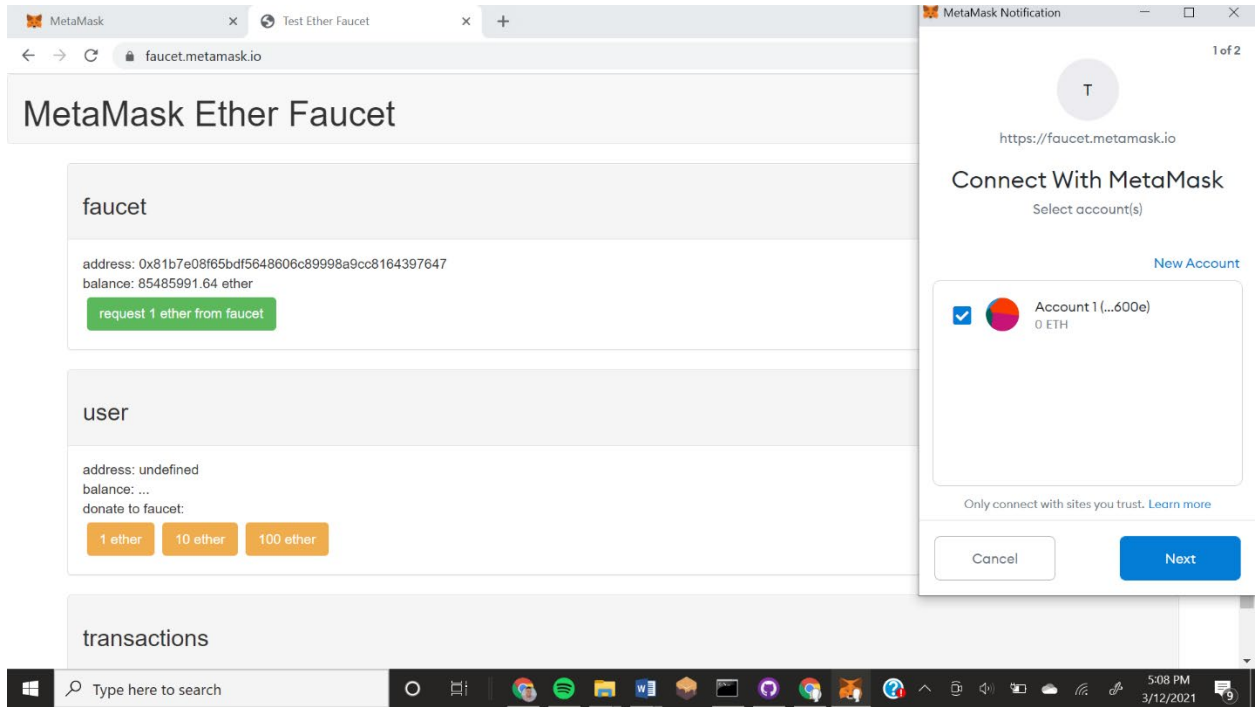

13. Go ahead and click "Next"

14. Click "Connect"

15. Wait a few seconds, and you should now have 1 ETH in your wallet!
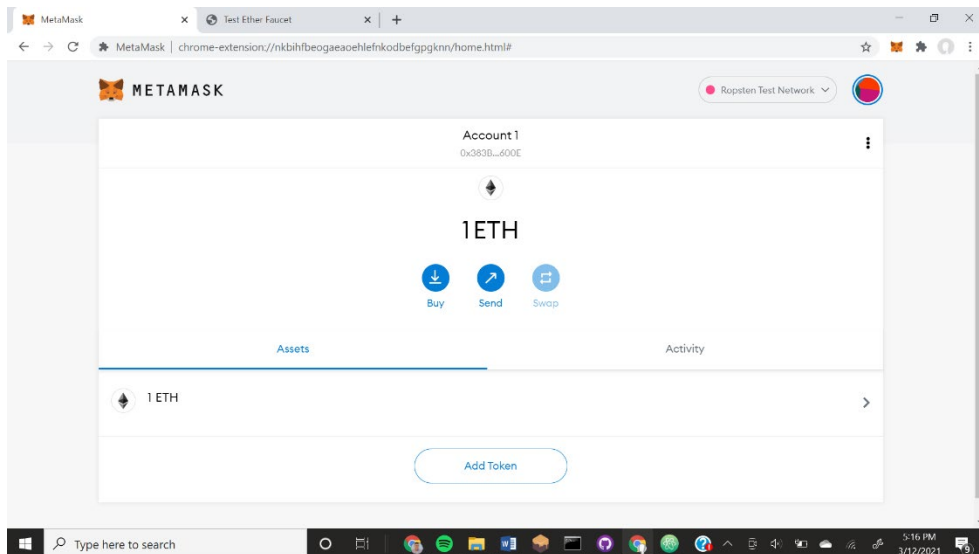
Congrats! You made it through the setup! I'm now going to give you a brief overview of how this thing works! I'm only having everybody make one post, but you can of course post more if you would like. You can also "tip" posts on the network that you like! When you click the tip button, you can send 0.1 of your ETH to the person who made the post! So, let's take a quick look at how to make a post

Creating a Post

1. Navigate to the website at lukeroz1.github.io/build
2. When you arrive at the page, you should see MetaMask pop up on the right side. Go ahead and select your account with 1 ETH
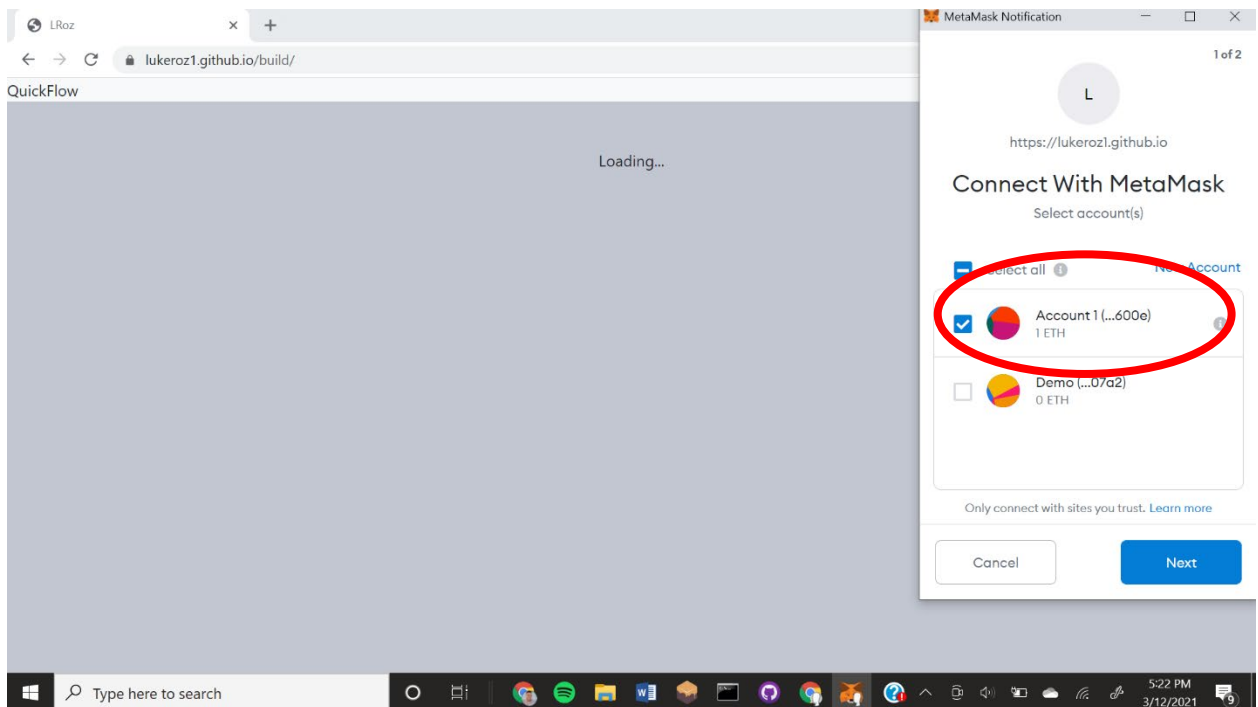

3. Click "Next"

4. Click "Connect"

5. You should now see the main page! No guarantees, but you may see a couple of posts made by yours truly on the front page. I didn't expect those to stick around or else I would have written something a bit more meaningful… whoops

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6. Go ahead and type whatever you want to in the box! As far as I know, there is no character limit, so go crazy
7. Whenever you're ready, click the blue "Share" button
8. MetaMask, as it has multiple times thus far, should pop up on the right hand side. This window will show you how much this post will cost. It's practically nothing, so don't worry about it draining your resources
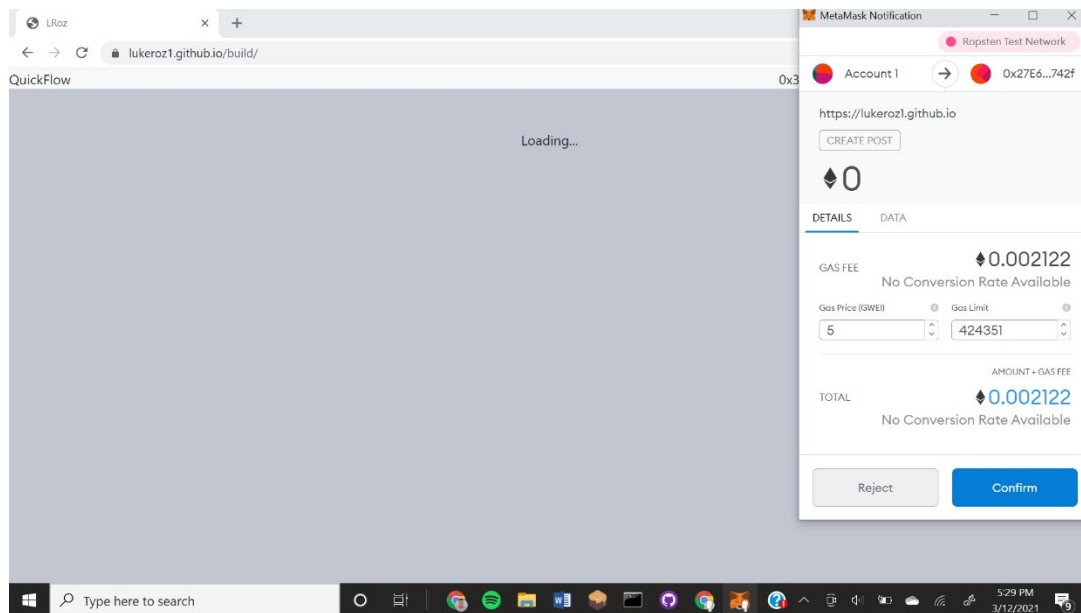
9. Click "Confirm"

10. You should see a confirmation in the lower left after you click confirm… this may take decent amount of time (as long as 20 or 30 seconds… not quite sure why, but it should work nonetheless!). I didn't get a picture of this notification popping up in the lower left, but it should look something like this
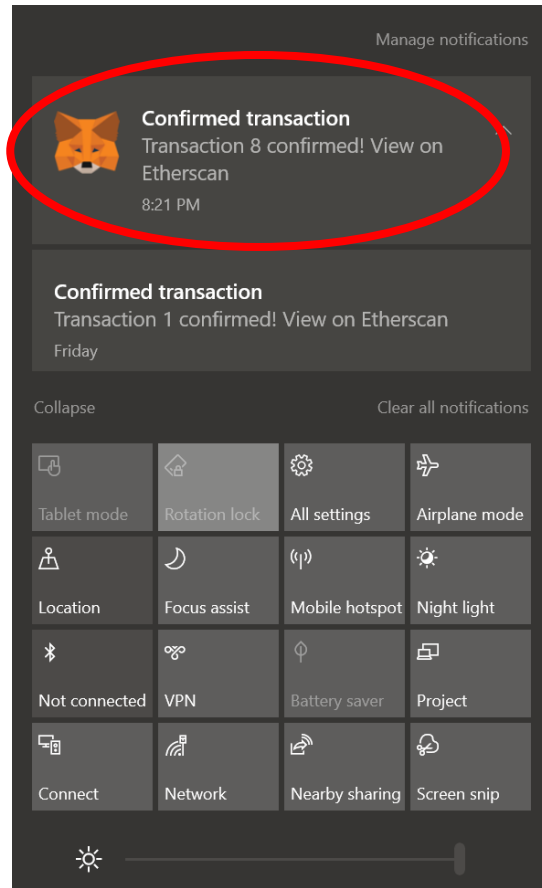
11. IMPORTANT: The page may still say "Loading…" after you click confirm and you see that notification from Chrome that the . This is a glitch I just can't figure out, so I'm just leaving it be. Go ahead and refresh your page if the site gets stuck

12. That's it! You should see your post on the site! As of right now, the posts are sorted by highest to lowest tipped, so your post may not be at the top. But, it will rise up if it gets more tips!

I can't thank you guys enough for helping me out with this! Again, if you have any questions for me about how this works, please feel free to let me know. Thank you guys again!

-Luke Roznovsky

APPENDIX B: SURVEY

QuickFlow: Survey Questions

Question 1: Out of 10, how would you rate your overall experience using the social network? I promise my feelings won't be hurt if it's a low rating! There were definitely things that could be improved

Question 2: What was your favorite part about the social network?

Question 3: What was your least favorite part about the social network?

Question 4: What is one suggestion you would make to improve the network? Again, my feelings won't be hurt if you have a lot of suggestions. I also understand if you can't think of anything.

Question 5: Do you feel that realistically, a social network using blockchain technology and virtual currency could be implemented on a larger scale? Feel free to elaborate if you would like.

Question 6: Any questions for me?

After you answer these questions, you are completely off the hook! Again, I can't thank you enough for helping me out with this project. I wish you the best for the rest of the semester!

Respectfully,
Luke Roznovsky