Innovation in the Blockchain

And its implications within current and future applications

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ABSTRACT

Currently, within the Blockchain, many different innovations have been made since the initial creation of Bitcoin in 2009. Bitcoin was the first cryptocurrency created in the world, but many more cryptocurrencies and applications have been built off the idea of the Blockchain. Three innovations made in the realm of cryptocurrencies would be being able to create "smart contracts" within certain blockchains, the many different "alt-coins", and different marketplaces and decentralized applications. An innovation that has become popular within the last few years would be ERC-20 tokens. To uphold this claim of the popularity of ERC-20 tokens, I have developed a web scraper using Python and BeautifulSoup to scrape, compile, organize, and graph data containing information related to the 7-day transfer totals among these tokens as well as the current amount of active users. Discussion delving further into the development and deployment of this application will be stated further in the paper. Continuing on the importance of ERC-20 tokens today, these tokens are being used within the crowdfunding space, acting as a decentralized alternative to platforms such as GoFundMe or IPOs, being the standard for "smart contracts" within the Ethereum blockchain, and also being able to create decentralized online collectives where everyone can have a vote towards a certain goal. We'll dive deeper into ERC-20 tokens within this paper by discussing what these tokens exactly are, the different communities that form around these tokens, and the many different applications that have risen out of these tokens. The discussion will also include the current state of blockchain and some innovations that could feasibly happen in the near future such as the transition to Proof of Stake from Proof of Work.

CCS CONCEPTS

• Cryptocurrencies; • Blockchains; • Ethereum; • ERC-20 tokens; • Decentralized Applications; • Proof of Work; • Proof of Stake; • Blockchain Innovation;

KEYWORDS

DAOs, ICOs, ERC-20, dApps, Segwit, Sharding, Data Provenance, Smart Contracts, SHIB, StandardDAO, Storj

1. Introduction - A Brief History of Blockchains and Implications

In 2009, the world was introduced to the concept of the Blockchain. A blockchain is essentially a ledger that is shared and immutable while also achieving the processes of recording transactions and/or tracking assets [1]. The first cryptocurrency to be created would be Bitcoin created by Satoshi Nakamoto in 2009, and the main backbone of Bitcoin is the blockchain that was first created within it. Another aspect of Bitcoin that was newly created and directly tied to keeping a blockchain ongoing would be the process of "mining", or Proof of Work, in cryptocurrencies. The process of mining involves continually incrementing a nonce in a block the miner has generated until the miner finds a value that gives the block's hash the required number of zero bits [2]. Within Bitcoin, the process of mining is extremely competitive due to the block reward of Bitcoin being at stake. These miners compete by each of them generating their own nonce in hopes of being the one to first find the nonce. The

miner who first finds a nonce is able to be first in proposing a block, thus heightening their chances of earning the block reward. A direct correlation to finding a nonce faster is to have more and better mining hardware. So by having approximately 1,000,000 miners throughout the world [3], it follows that the energy usage of Bitcoin is an incredibly large amount.

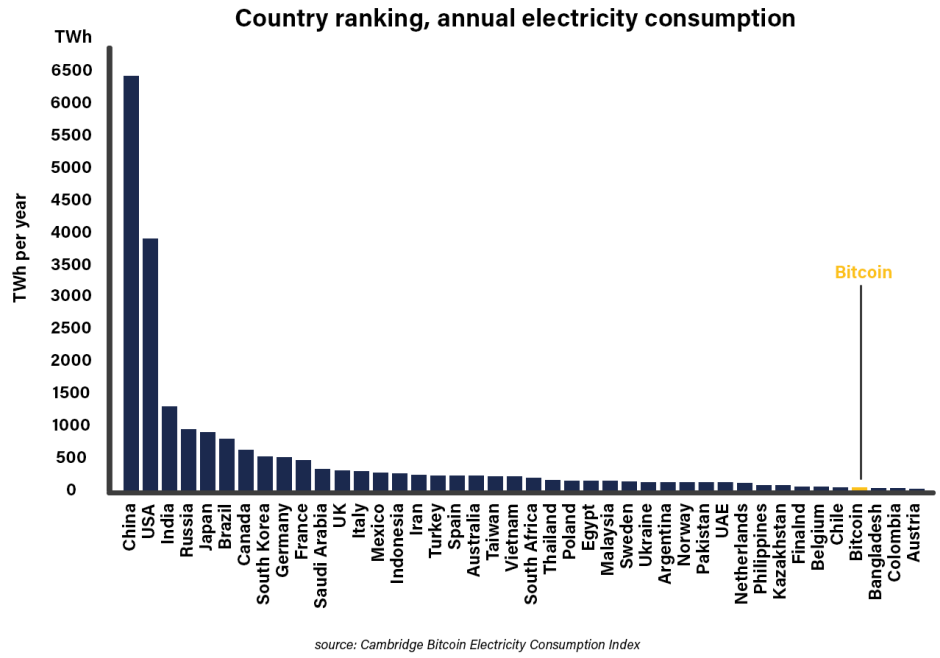

Figure 1: Yearly Energy Usage of Bitcoin in 2021 [4].

Referencing the graph above, one can see that Bitcoin's yearly energy consumption is greater than that of some countries such as Bangladesh, Colombia, and Austria. Energy usage such as this is a clear detriment to the environment and climate. One way to vastly lower the amount of energy, and have a lighter toll on the environment would be to transition these cryptocurrencies to Proof of Stake, an innovation in the blockchain, instead. A deeper discussion of Proof of Stake and its implications is covered in more detail later in this paper.

Various alternative cryptocurrencies, or Alt-coins, have also been created since the introduction of Bitcoin. These coins were able to take the main ideas from Bitcoin and put their own unique functionality into their coin. For example, Namecoin was an Alt-coin that was created from a fork in the Bitcoin software. Namecoin and Bitcoin are essentially the same cryptocurrencies, however; Namecoin had additional functionality that was created as a basis for a decentralized domain name system (DNS) [5]. Dogecoin is another Alt-coin that has been created. Dogecoin has recently gained the following of a large community and exponentially increased in value due to the likes of famous entrepreneur, Elon Musk. Further, we also have Ethereum which is the 2nd most popular cryptocurrency and the most popular Alt-coin in terms of current value to USD.

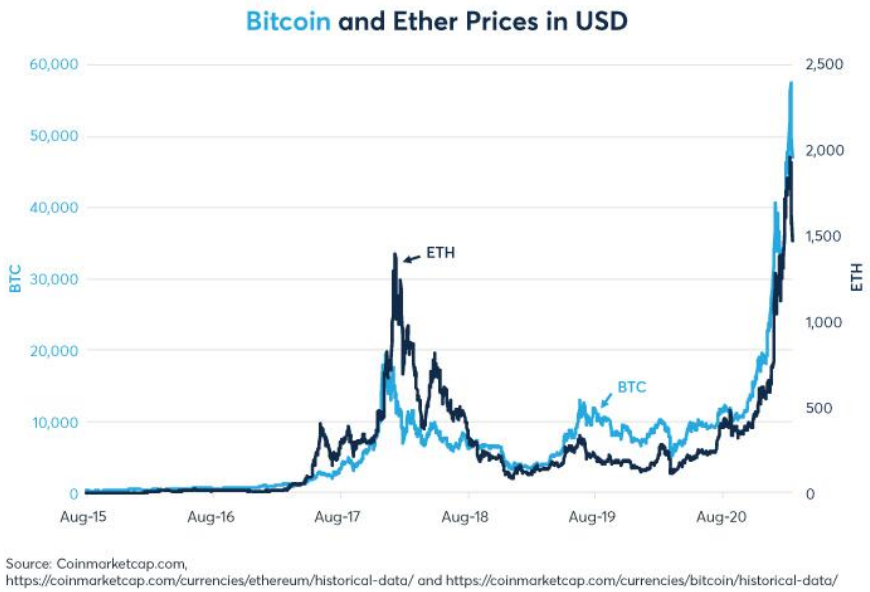

Figure 2: Comparison Graph for BTC and ETH [6].

Although different cryptocurrencies may rise in popularity and return higher percentage gains than when compared to Bitcoin and Ethereum, these two currencies have remained at the top in terms of direct value to USD.

Throughout the rise of cryptocurrencies and blockchains, various decentralized applications and marketplaces have also arisen. One example would be the infamous Silk Road, a decentralized black market that was used for the buying and selling of illegal or unethical items [7]. This marketplace provided users with anonymity and utilized the Tor network and Bitcoin transactions for privacy [7]. This illegal site was eventually shut down when its founder Ross Ulbricht was caught and arrested. Although there are some illegal implications of cryptocurrencies, there are also many ethical applications that fill a need within society, some of those being various NFT (Non-fungible token) marketplaces such as OpenSea or Foundation. NFTs have become very popular in 2021 and 2022. Some people believe that NFTs are the future and that various types of physical media today will transition into NFTs, while others, like Keanu Reeves, have strong feelings against NFTs believing that they are just all “hype” or a joke and have no real use [8]. There are also those, like Gary Vee, who believe that NFTs have a place in society, but currently have too much “hype” around them [9]. One area in particular that which NFTs have been able to provide a positive benefit would be in the fine art realm. Without NFTs, the most popular way for artists to sell their work online would be through physical prints, which has some downfalls due to having to physically ship the art. Once NFTs entered the art realm, artists such as photographers have been able to sell their work in a new format through NFTs. Artists are now able to instantly sell their work on the blockchain and not have to worry about shipping. These artists are now also able to form communities around their art through NFT collections such as “Where My Vans Go” by Driftershoots [10] or “Bored Ape Yacht Club” by BoredApeYachtClub [11]. If someone buys into one of these collections, they then have the opportunity to be a part of a smaller community and have access to different events and online group chats.

One of the main innovations that have risen out of cryptocurrencies and blockchain and what will be a large part of the discussion in this paper would be the ERC-20 token. The ERC-20 token has been able to play a large role in the area of decentralized applications. Some of the applications or implications include community-led organizations with no central authority through decentralized autonomous organizations (DAOs) [12], easily accessible crowd-funding through initial coin offerings (ICOs), and various decentralized applications i.e. Storj, a decentralized cloud storage platform.

2. What Exactly is ERC-20?

ERC is an abbreviation of “Ethereum request for comment”. These ERCs are standards that are created by Ethereum developers from requests from the community. Further, ERC-20 is the smart contract standard in Ethereum and also outside of Ethereum, meaning that it is a common list of rules followed to ensure compatibility between the many different tokens on Ethereum’s network [13]. This compatibility is that these tokens can be used in all cryptocurrency wallets that are able to hold Ethereum addresses [13]. Some of the rules in ERC-20 include how the tokens can be transferred, how transactions are approved, and even setting the total supply of the token [13]. Another key aspect of ERC-20 tokens is that they are fungible, meaning that each token is identical to one another. This is a distinct difference from NFTs which are mostly built off of the ERC-721 standard. Using the fungibility of ERC-20 tokens, unique features are able to exist exclusive to these tokens.

3. Popularity and Use of ERC-20

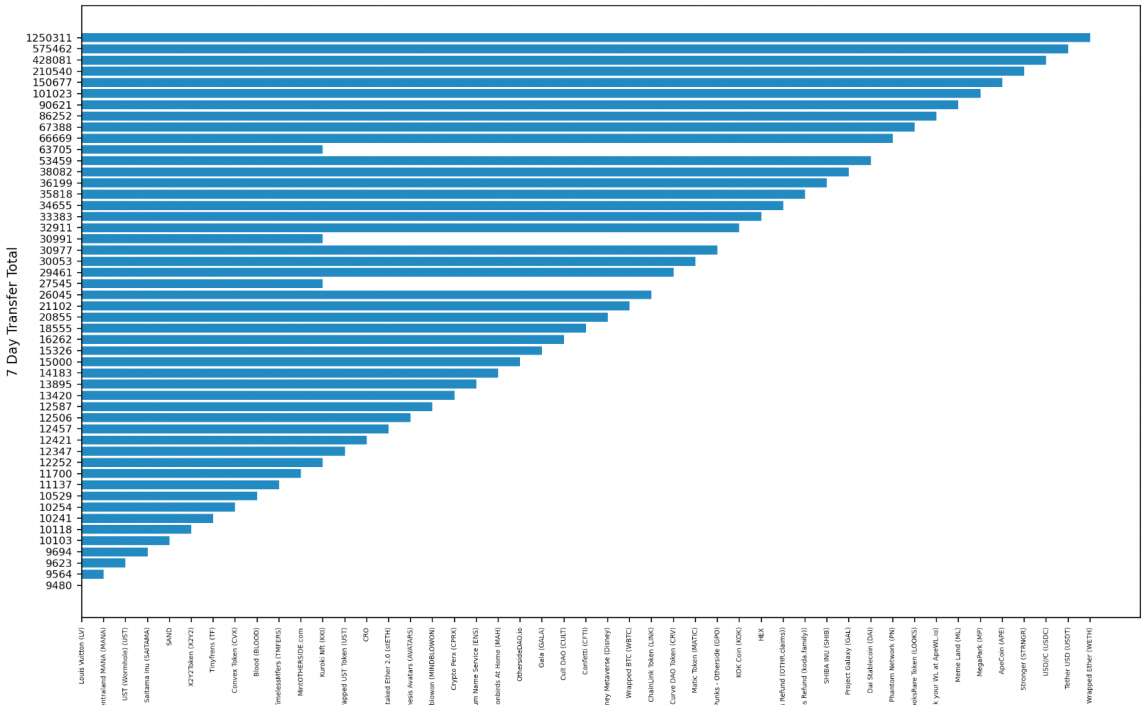

Figure 3: Graph comparing 7-day transfer totals with ERC-20 tokens [14]

Taking a look at the graph above, one can see that there is a vast difference in the amount of 7-day transfers between different ERC-20 tokens. Plotted on the bar graph, it shows that for the Wrapped Ether Token, there were 1, 250, 311 transfers within the last 7 days, with the Tether Token there were 575, 462 transfers, and with Apecoin there were 210, 540 transfers. There are many more tokens listed on this graph as well as 49 more pages available to scrape on “bloxy.info”, but we won’t dive any further than the tokens listed above. Even though the other ERC-20 tokens decline in 7-day transfer totals, it still shows that these many tokens are being used within many different communities throughout the world.

When designing this web scraper, I decided to choose the 7-day transfer totals as the y-axis in this graph to show the clear active use of the different tokens within the ERC-20 token community. Thus by looking at the graph above, it is clearly shown that these tokens are being well used throughout the world and prove to solve some specific use cases for different users.

Web Scraping Algorithm [14]

```
import requests
from bs4 import BeautifulSoup
import matplotlib.pyplot as plt

erc20_list = []
7daytransfer_list = []

for i in range(1, 51):
  webpage_response = requests.get("https://bloxy.info/list_tokens/ERC20?page=" + str(i))
  webpage = webpage_response.content
  soup = BeautifulSoup(webpage, "html.parser")

  erc20Tags_list = soup.find_all(attrs={"class": "ellipsis"})

  for token in erc20Tags_list:
    erc20_list.append(token.a.string)

  sevenDayTransfer_list = soup.find_all(attrs={"class": "text-right"})

  for transfer in sevenDayTransfer_list:
      if (str(transfer.string).isnumeric()):
        7daytransfer_list.append(transfer.string)

erc20_list = erc20_list[::-1]
transfer_list = transfer_list[::-1]
plt.barh(transfer_list, erc20_list)
plt.xlabel('ERC-20 Tokens')
plt.ylabel('7 Day Transfer Total')
plt.yticks(fontsize = 8)
plt.xticks(rotation = (90), fontsize = 5)
```

```
plt.show()
```

Taking a look at my algorithm above, we can see the exact process taken to provide the outputs needed. Using requests, we first pulled in an entire webpage for each page on the site. Next, we prepped the page for analysis by creating a BeautifulSoup object of the current webpage. Using Chrome Dev Tools, one is able to see that the specific data that we are looking for is underneath two different classes, “ellipsis” corresponding to the ERC-20 token names and “text-right” corresponding to the 7-day transfer totals. Once categorizing all the correct tags the filtering process could now begin. Using two for loops, the specific data was able to be pulled out of the designated tags and filtered as needed. Lastly, both lists needed to be inverted in order for data to display correctly. The time complexity of this algorithm would be O(2nk). This is due to the process of pulling two sets of n length data and completing that process k times. Space complexity is also O(2nk) since each set of the two sets of n length data in lists k times.

3. Classification of ERC-20 Tokens

As stated in section 2, one can see that there is a clear use of ERC-20 tokens within society, but how are these tokens used and what innovation have they provided above Bitcoin, the original cryptocurrency. ERC-20 tokens are mostly used in 4 main sectors, StableCoins, ICOs, DAOs and Community tokens, and within various applications.

Taking a first look at StableCoins, which mostly entail wrapped coins. These wrapped coins are designed to follow the price of a certain currency such as Ethereum and Bitcoin, being the Wrapped Ether Token and Wrapped Bitcoin, the U.S. dollar, being Tether, USDT, and USDC. Some wrapped tokens even follow physical minerals such as the value of Silver, being the SilverToken (SLVT). The reasoning behind the wrapped token is to allow unsupported assets to be used, traded, lent, and borrowed on various decentralized finance (Defi) platforms [15]. For example, if a user wanted to take advantage of Ethereum’s faster transaction time when compared to Bitcoin, the user could convert their Bitcoin to Wrapped Bitcoin, complete their transaction, then convert their Wrapped Bitcoin back to Bitcoin. Another application where wrapped tokens can be used could be when traveling to different countries. If a user wanted a decentralized way to transfer money between countries they could hold their money in SLVT. Then when traveling abroad they could go to a silver vault in that country and exchange their SLVT for its worth in Silver. Lastly, they could convert their Silver to the local currency of the country they are currently in. This is a clear innovation in the realm of Blockchains and their applications. With standard Bitcoin, a user would be unable to take advantage of other Blockchain improvements. Using Bitcoin abroad within other countries is still definitely possible, but by using SLVT, the process is more streamlined than that of trying to convert the current volatile value of Bitcoin to its worth in Silver.

An Initial Coin Offering (ICO) is an innovation that mostly uses ERC-20 tokens to provide its services [16]. As discussed within the abstract, ICOs have risen as decentralized alternatives to crowdfunding different projects. ICOs correlate more with an alternative to Initial Public Offerings (IPOs). ICOs have recently come under skepticism due to the possibility of the ICO being a scam. A recent study stated that around 80% of all ICOs are within the groups Scam, Failed, Gone Dead, and Dwindling [17]. Although this may be true, IPOs can tend to have the same issues. When a person wants to invest in an IPO or ICO, they believe that this company will succeed, thus that is why they put their money into the fund. There is no guarantee that the company they invested in will stay in business, so there is always a chance that an IPO could also fall into the same categories Scam, Failed, Gone Dead, and Dwindling. In contrast to IPOs, ICOs are typically much easier to create, thus having a lower barrier to entry. To create an ICO, all one needs is have a cryptocurrency that they would like to use and a token to use as the product, like a share [16]. In contrast, the process of creating an IPO can take 6 months to a year and has 5 main steps in the process [19]. Thus, it can easily be seen that an ICO decentalizes the IPO process making crowd-funding for projects, companies, and start-ups much more accessible to the general public.

Another way that ERC-20 tokens are used today would be as a type of community token. Some of these different community tokens include Decentralized Autonomous Organizations (DAOs) and the Shiba Inu token (SHIB). DAOs correlate with acting as a collective that works to streamline progress toward the progress of a common goal

[18]. These decentralized organizations remove the bureaucracy that tends to come with more centralized organizations. Typically with centralized organizations, even though each person may still be able to have a vote in the direction of the organization, there are still people who are in charge of running the organization and keeping things running smoothly. Although most people running an organization will have good intentions, there is still a chance that someone could infiltrate the organization and act in a malicious way with their newfound power in the organization. DAOs are able to solve this issue by having the organization be self-sustaining, meaning that they do not need a group of individuals in charge of running the organization. This process is achieved by using "smart contracts". These "smart contracts" allow for certain processes, such as security or salary for members, to be automated. DAOs allow for more transparency in what steps and actions are currently being taken by the organization, so instead of having to rely on the executives of the organization being transparent about their actions and trusting them not to be influenced by outside forces, members can view the "smart contracts" and see exactly what is happening at the moment. Some examples of DAOs today include BlockbusterDAO which aims to buy back Blockbuster from Dish to transform it into a Flim3 Studio and Streaming platform, and StandardDAO, a global community that manages the Standard treasury which is used to fund Environmental, Social, and Governance (ESG) investing mandates throughout the world. StandardDAO is able to decentralize the process of making impacts within communities by using the Standard treasury's funds to directly make an impact based on votes from members. Other community tokens like the Shiba Inu token have a slightly different take on the community aspect when compared to DAOs. These tokens focus more on the community and experience. Taking a look at Shiba Inu, its popularity mostly rose due to its association with Dogecoin on its rise. Within various social media pages such as r/WallStreetBets and different niches within Instagram, Twitter, and TikTok, communities began to form around this token. These communities typically discussed positive takes on the token while also spreading word about the token in hopes of the price of the token rising, thus allowing for higher profit gains for owners of the token. Similar rises in popularity can be seen with Dogecoin and how its Reddit channel gain 19,000 users in 2 weeks while also having a 300% price gain [20].

Decentalized applications (dApps) are a real-world of ERC-20 token as well. DApps sometimes take existing centralized ideas or projects and make them decentralized or they can be completely new applications. Further, dApps typically take advantage of the fact that ERC-20 tokens are the "smart contract" standard, but they can also be used as a type of incentive for users to use their platform, or they might use both concepts within their appliations. One application in particular that does this is Storj. Storj is a decentalized cloud storage platform that takes advantage of a users extra disk space and allows them to host this space online for other users. By hosting their extra disk space online, the storage owner can make profit in the Storj ERC-20 token. Another type of dApp that someone could make would be a decentalized game. This type of game could allow the in-game currency to be an ERC-20 token. This token would be exchanged in game, but could also be transferred out of the game to exchange

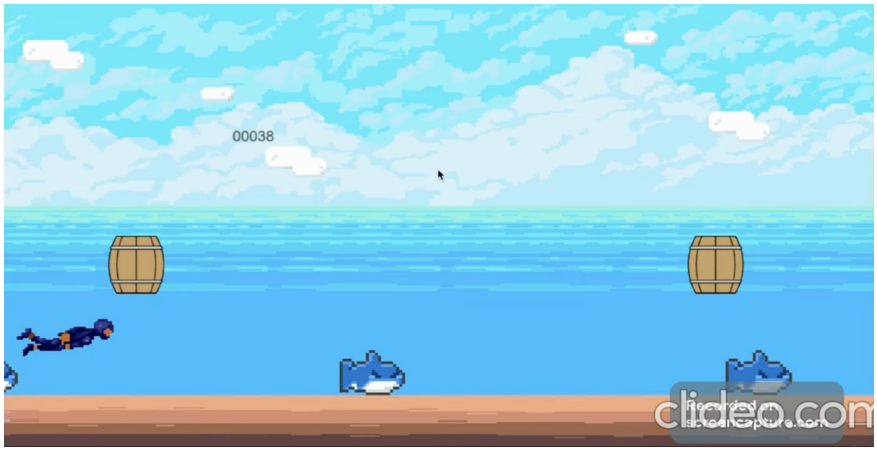

Figure 4: SeafishSwimmer NFT game [21]

for fiat currency like USD. A similar decentralized project that I recently worked on was called SeafishSwimmer [21]. This was an educational ocean climate game which taught the player about ocean climate and pollution. If the user was the player with the highest score at the end of the day, they would be rewarded within an randomized NFT prize based on the Hedera HashMap Blockchain, however; this NFT prize could easily be swapped out for a reward in ERC-20 token. This project just proves to show the popularity of decentalized games and apps by allow the player to have new type of connection with games that haven't been available to players before the rise of NFTs and ERC-20 tokens.

3a. Applications of ERC-20 for Today and the Future

ICOs, DAOs, and dApps are popular and becoming a larger staple in our society, but there is still much that these applications and organizations can improve on for the future. ICOs have their use cases within companies and start-ups today, but for the future individuals should educate themselves more on the topics of ICOs, what exactly they are, and come to their own decision should they choose to invest money into one. ICOs are very similar to IPOs, but there are some clear differences, one of those being that IPOs have voting built directly into each stock that a person owns. Thus, ICOs act in a similar way to IPOs, yet there is some small functionality that is different between the two. An ICO could transition to a DAO to allow for voting, but there would be some other differences in functionality created if that transition did happen.

DAOs, similar to ICOs, are not perfect as well. Due to the fact that DAOs are dependent on their "smart contracts", the developers must be incredibly careful when creating one. For example, the first popular DAO "TheDAO", was a hedge fund like organization and launched in 2016. It became incredibly popular and rose 150 million USD, however; in June 2016, due to an error in the code, 50 million USD was stolen by an attacker [22]. This attack, in turn caused the fork in the Ethereum blockchain by allowing the stolen funds to returned to the investors in "TheDAO". Thus, DAO creators should continually improve on security within their own organizations to prevent an attack such as this from happening again.

DApps also have room to improve in the design and use-cases of their apps, as well as having developers consider expanding their area of development into new spaces. Storj was a clear example of how a decentralized application can take an already existing idea of cloud storage and turn it into a decentralized platform. For future implications, developers could look into other centralized platforms and brainstorm different ways to convert these into decentralized versions. Within the gaming space, developers should look to expanding their area of development into the "Metaverse". With popular tech giants such as Microsoft acquiring Blizzard for 69 billion [23], this just proves to show that Big Tech is making an investment in the future of "Metaverse" gaming, so developers should not let this opportunity slip past them.

4. What's Happening in the Blockchain Currently?

Following up on ERC-20 tokens, we can't look over the fact that ERC-20 is part of the greater Ethereum blockchain. So let's take a deeper look at the current state of the blockchain. Some various innovations within the blockchain include companies using Blockchain as a Service (BaaS), the rise of NFTs and "smart contracts", and also the transition to Proof of Stake (PoS) from Proof of Work (PoW). These innovations are currently being implemented by Microsoft, Amazon, and Deloitte using BaaS [23], Ethereum on transitioning to PoS, and various indivudauls and companies utlizing NFTs and "smart contacts".

4a. Transition From PoW to PoS within Ethereum

One large transition and innovation that is happening with Blockchains currently is the transition to PoS. Currently, the second largest cryptocurrency after Bitcoin is Etherum, as discussed in section 1. With Etherum currently in the process of transition to PoS from PoW, this would have a drastic effect on its energy usage. Latest reports suggest that after the transition to PoS from PoW within Ethereum would cause its energy usage to decrease by 99.95% [24].

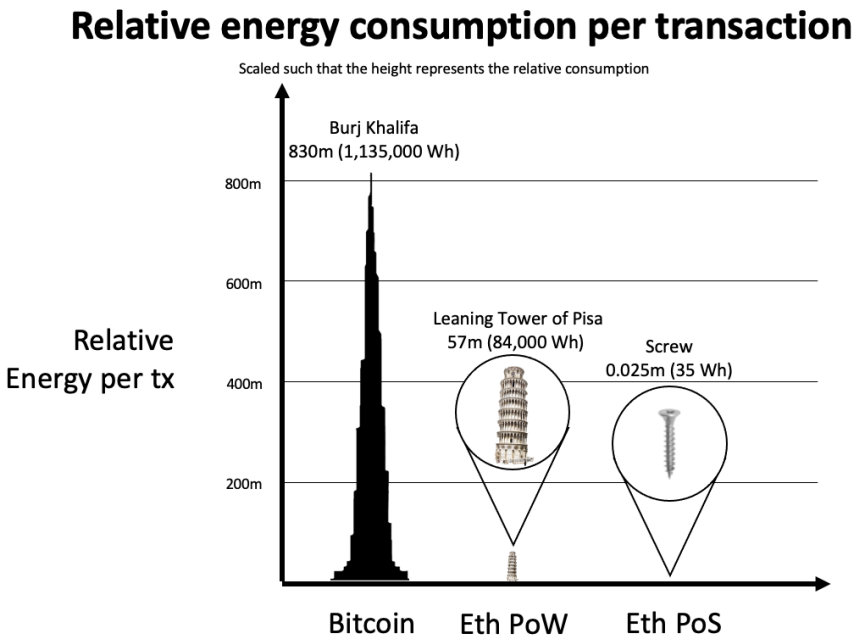

Figure 5: Graph comparing Ethereum PoW vs PoS [24]

While energy is one large effect of the transition to PoS, what are some of impacts that this transition could have? Some short-term effects could include having all of the current miners making sure that their hardware is up-to-date after the the hard fork. Another short-term effect is that users would be unable to withdraw their current stake Etherum, but that would only be for a short period after the transition [24]. Some long-term effects include the vast energy and environmental impact discussed earlier, but it would also allow individuals to have an easier time when become validators due to PoS not needing expensive hardware to mine.

4b. How Will this Transition Effect ERC-20 tokens and NFTs?

There are two different paths the transition could go, but it will most likely end up going smoothly in the end. Firstly we have the smooth transition (The Merge). This is where as Ethereum would transition to its new protocol, all of the attached innovations built off of the chain such as contracts, tokens, and NFTs would be automatically duplicated on the forked chain as one of the 64 shards that is apart of Ethereum 2.0 [25]. A less smooth transition could also occur where a group of unhappy miner could decide to continue mining to the original chain instead of transitioning, thus creating a similar situation as to what happen with Ethereum Classic and “TheDAO” [22], however; in the end, the transition will still occur and most likely all of the miners will transition due to the vast amount of innovations and applications currently built off Ethereum.

4c. How Can We Improve on the Blockchain

Earlier we discussed some current innovations of the Blockchain, but let’s dive deeper into what the future may hold for the Blockchain. Out of the many ways that society can improve on the Blockchain, there are 2 different ways we’ll discuss in this paper, utilzing Segwit or increasing the block size, both of these relating to scalability. By using Segwit or Segregated Witness, which is increasing the number of transactions in a block without increasing the size of that block. By accomplishing this, the transaction speed of the blockchain would increase with no downside. One

way of accomplishing this would be to change the way that digital signatures are used within a block and being able to utlize the digital signature space for transactions instead. The digital signature takes up 65% of the block, so being able to shrink or remove this part of block would open up a large amount of space for more transactions [26]. On the other hand, developers could also choose to increase block size instead. This innovation would make full nodes for PoW blockchain more expensive due to these nodes having to store more of blockchain due to larger blocks, but this effect would allow for miners to receives more rewards from transactions fees due to more transactions being present in each block [26].

REFERENCES

[1] Anon. What is blockchain technology? - IBM Blockchain. Retrieved May 10, 2022 from https://www.ibm.com/topics/what-is-blockchain

[2] Anon. Bitcoin: A peer-to-peer electronic cash system. Retrieved May 11, 2022 from https://bitcoin.org/bitcoin.pdf

[3] Sanela PuacSanela has always found pleasure in studying linguistics and the way language forms modern-day human interactions. As she pays great attention to detail, Bojana Petkovic, and Marina Avramovic. 2022. How many bitcoins are there and will they ever run out? (February 2022). Retrieved May 10, 2022 from https://capitalcounselor.com/how-many-bitcoins-are-there/#:~:text=Overview%20of%20the%20Key%20Bitcoin%20Stats%20and%20Facts&text=There%20are%20approximately%201%2C000%2C000%20Bitcoin,18.74%20million%20bitcoins%20in%20circulation.

[4] Raynor de Best. 2021. Bitcoin energy consumption worldwide 2017-2021. (October 2021). Retrieved May 10, 2022 from https://www.statista.com/statistics/881472/worldwide-bitcoin-energy-consumption/

[5] Jake Frankenfield. 2021. What is namecoin? (May 2021). Retrieved May 10, 2022 from https://www.investopedia.com/terms/n/namecoin.asp

[6] Anon. Ether-bitcoin co-movement and supply-demand dynamics - CME group. Retrieved May 10, 2022 from https://www.cmegroup.com/education/featured-reports/ether-bitcoin-co-movement-and-supply-demand-dynamics.html

[7] Jake Frankenfield. 2021. What is namecoin? (May 2021). Retrieved May 10, 2022 from https://www.investopedia.com/terms/n/namecoin.asp

[8] Dani Di Placido. 2021. Keanu Reeves thinks nfts are a joke. (December 2021). Retrieved May 10, 2022 from https://www.forbes.com/sites/danidiplacido/2021/12/11/keanu-reeves-thinks-nfts-are-a-joke/?sh=2df84e6a1117

[9] Phil Rosen. 2022. Gary Vaynerchuk says 98% of NFT projects will fail after the gold rush fades. here's why 2 experts think he might be right. (February 2022). Retrieved May 10, 2022 from https://markets.businessinsider.com/news/currencies/gary-vaynerchuk-nfts-experts-forecast-market-crypto-fail-protocollabs-veefriends-2022-2

[10] OpenSea. Where my vans go - collection. Retrieved May 10, 2022 from https://opensea.io/collection/where-my-vans-go?utm_source=hoobe&utm_medium=page

[11] OpenSea. Bored ape yacht club - collection. Retrieved May 10, 2022 from https://opensea.io/collection/boredapeyachtclub

[12] Anon. 2021. What is a dao and how do they work? (October 2021). Retrieved May 10, 2022 from https://consensys.net/blog/blockchain-explained/what-is-a-dao-and-how-do-they-work/

[13] Tim Falk . 2021. Top ethereum erc20 Tokens Guide & List. (October 2021). Retrieved May 10, 2022 from https://www.finder.com/erc20-tokens

[14] Anthonyimmen. Anthonyimmen/ERC-20_web-scraper: Web-scraper for bloxy.info to pull ERC-20 token names and their 7 day transfer totals. Graphs the two data sets against each other using matplotlib. Retrieved May 10, 2022 from https://github.com/anthonyimmen/ERC-20_web-scraper

[15] Robert Stevens. 2022. What are wrapped tokens? (February 2022). Retrieved May 10, 2022 from https://www.coindesk.com/learn/what-are-wrapped-tokens/

[16] Anon. Icos – the new ipos? how to fund innovation in the crypto age. Retrieved May 11, 2022 from https://www2.deloitte.com/content/dam/Deloitte/de/Documents/Innovation/ICOs-the-new-IPOs.pdf

[17] Shobhit Seth. 2020. 80% of ICOS are scams: Report. (September 2020). Retrieved May 10, 2022 from https://www.investopedia.com/news/80-icos-are-scams-report/

[18] PhD Nick Sokol. 2022. The power of the dao. (April 2022). Retrieved May 10, 2022 from https://medium.com/standard-dao/the-power-of-the-dao-73fdb3bba40

[19] Anon. 2022. IPO process. (May 2022). Retrieved May 10, 2022 from https://corporatefinanceinstitute.com/resources/knowledge/finance/ipo-process/

[20] Arianne Gift. 2022. How did dogecoin get so popular? (May 2022). Retrieved May 10, 2022 from https://micky.com.au/how-did-dogecoin-get-so-popular/

[21] Darren Fisher posted an update — Feb 13, Ken Tu posted an update — Feb 13, and Ken Tu started this project — Feb 13. Seafishswimmer. Retrieved May 10, 2022 from https://devpost.com/software/seafishswimmer

[22] Youssef Faqir-Rhazoui, Javier Arroyo, and Samer Hassan. 2021. A comparative analysis of the platforms for decentralized autonomous organizations in the Ethereum Blockchain - Journal of Internet Services and Applications. (October 2021). Retrieved May 10, 2022 from https://jisajournal.springeropen.com/articles/10.1186/s13174-021-00139-6

[23] Anon.Retrieved May 10, 2022 from https://www.analyticsinsight.net/top-emerging-blockchain-technology-trends-to-follow-in-2021/

[24] Ethereum Foundation. Ethereum's energy usage will soon decrease by ~99.95%. Retrieved May 11, 2022 from https://blog.ethereum.org/2021/05/18/country-power-no-more/

[25] Anon. The merge. Retrieved May 11, 2022 from https://ethereum.org/en/upgrades/merge/

[26] Anon. Analysis of the possibilities for improvement of Blockchain technology. Retrieved May 11, 2022 from https://www.researchgate.net/publication/330585021_Analysis_of_the_Possibilities_for_Improvement_of_BlockChain_Technology