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The Existential Crisis of the New World Digital: How Centralization Stole the Internet and What Blockchain Technology Could Offer the User

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How Centralization Stole the Internet and What Blockchain Technology Could Offer the User

by

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Abstract

The thesis examines how the technology of blockchain can be used as governing mechanism to create a more democratic digital space. Starting with an overview of internet history, this section contextualizes the terms “sterile” and “generative” technology. This tension is a constant in internet history with blockchain being the “generative” pull away from the more “sterile” server stack model of big tech. Both current state and corporate governances are built off a more centralized model, however with blockchain technology, democracy, as well as company structure is being re-examined. Ideas such as stakeholder capitalism and open democracy are a similarly “generative” model as opposed to the more centralized “sterile” approach of more traditional democracies. With a space that humans communicate also comes ethics that define the morals and norms of the space. In a more centralized model, utilitarian and deontological approaches to ethics have provided a groundwork for a just society prior to the computer. However, the computer, acknowledging the multiplicity of “being,” requires an approach to ethics that is more decentralized than these current ethical models. Existentialism, through Sartre’s examination of “being,” exposes the flaws in centralized ethics through the acknowledgment of human “beings” as being in a constant flux with their “being” being defined by a “being” outside of their own existence; “the Other.” This sets the stage to delve into the benefit of a computer system functioning more off a decentralized approach like a blockchain system. Decentralized Autonomous Organizations (DAO) directly tests blockchain as a governing system. Supported by the ethics of existential philosophy, blockchain, like state governance can be justified as a genuine form of governance. While there are drawbacks to blockchain the technology holds a lot of potential of creating the most democratic space in the history of the world.

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Introduction

A lizard, like all reptiles, has skin made of scales. These scales imbricate, overlapping to form the lizard's skin. The world is similarly constructed with the imbricating of self-consciousness comprising, constructing, and defining reality (Sartre, 1943). Each scale, a person; contributing to the whole, which is the world. The internet makes our relationship with the world and each other much more complicated. The multiplicity of "Being" is more present than ever; the self constantly scrutinized by others on social media sites such as Instagram and Facebook to the other levels of self within the individual.

Social media platforms, like Facebook, demanding users to authenticate themselves as if they were paying taxes to Facebook, violates the autonomy in which a person can conduct themselves online (Hann, 2019). These regulations, put in place to combat trolling by connecting the user to a real person that can face legal or social penance for "bad" conduct, refuse to acknowledge how the digital realm has different rules from reality. Early adapters of the internet saw this digital space as an extension of reality. Cyberspace is a place where a person could project a "Being" that wasn't possible in the physical world; but to perceive the space as parallel in function to reality would be incorrect. Time is different in this space, with information being interpreted and accessible all the time and at any time. Authenticity regulation assumes that if a user is not representing the user's physical being on every level, from name to history, then that individual is acting in "bad" faith. If a person has something to hide then they aren't being actually "authentic" to their "true" "Being." Authenticity isn't something determined by a central authority though; it is defined by the individual. In the context of social media platforms, the developer gets to decide what is "good" and "bad" information. Regardless of if the individual would have a more informed perception on whether they were being authentic to themselves or

not. The developer has the power to define authenticity since they have the say in what information is censored and what is allowed to be broadcast.

The flow of information is dictated by the central authority (i.e. Google) that facilitates this dynamic. Similar companies operate under democratic governments like the United States. Complying with the state through integration of democratic values and abiding by the laws of the state legitimizes the company. How governance is conducted in spaces facilitated by big tech companies is far less democratic than the states in which they operate. While sites like Facebook and Google take user data into account in decision making—it is by no means a system of voting or even delegating. The user has become both the customer and the product. Cyberspace turned from a space of expression into a place where identity could be monetized and therefore controlled through advertising. More broadly, this results in the financial incentives of business over open democracy.

In 1996 John Perry Barlow wrote an essay titled *The Declaration of Cyberspace*. This essay was written in response to Communications Decency Act (CDA). While most of the act was repealed outside of only section 230, Barlow's essay was important in the cultural revolt of the United States Government sanctions on the internet. Barlow, similar to critics of current government regulations on the internet, echoes the sentiment that traditional means of regulation will not work. There is no matter to the internet and the identities that inhabit the space are not physical (Barlow, 1996). The states motives are not aligned with the cyber libertarians and anarchists that defined the norms and ethics of the internet up until CDA. This dissonance has caused democracy on the internet to be preached by current legislators and big tech companies but is a far cry in practice. Cyber anarchists called cypher punks observed the centralization of

the internet and in an attempt to return the internet to its former decentralized state created the Web3 defining technology called blockchain.

Blockchain would guarantee user autonomy since decision making cannot be done without conferring with the full system. This process occurs when an exchange between two parties is made with validation of that exchange, checked and approved by everyone's ledger in the system. Hypothetically if a platform such as Instagram were to adopt blockchain then updates to the platform wouldn't go into effect until every member, from user to developer, approved the update. Like many democracies this voting process can involve delegation, but the ontology of decision making is an opt-out instead of posturing an opt-in system that is, in reality, closed off except to the individuals who developed and invested in the system early on.

A system like blockchain is considered to be an "open" more liquid democracy, encouraging participation over delegation. This principle establishes a much more intimate understanding between individuals operating within the system and how the system functions. In the context of a computational system this is how the system is coded. Individuals on a blockchain, in order to maintain legitimacy—which in turn generates value for the blockchain—rely much more on radical transparency than centralized democratic states. Radical transparency creates a space where information is exchanged openly with perceptions of intellectual property being a part of a whole, all while striving to make the most beneficial system to others rather than the individuals stake in the system.

The ontology of blockchain is rooted in existential philosophies such as "the Other" and the multiplicity of "Being" which is more concrete than ever before. A digital space allows for an individual to present themselves in a way that the "Being-for-itself" has far more influence on the perception of an individual than the "Being-in-the-world." These are types of "Being" and a

human interacts with multiple ways of their own and other's being in their period of existence. "Being-for-itself" represents the conscious self: the self that one defines as them in their own mind. The "Being-in-the-world" is one's true "Being": a "Being" defined by "the Other." A "Being" that, when you die, lives on in the lives of others that still remain.

The internet doesn't want you to leave. Companies like Google want you to stay in the digital space. Even before big tech, the internet was a form of escapism. In communities that are anonymous, one can become an entirely different person. Blockchain, used primarily in the context of cryptocurrency, brings reality into the digital space through finance. In a capitalist society what makes something have utility are how tangible and usable the thing is to the greatest amount of people. While all things start in as abstract (e.g. a thought in one's mind), if the project is successful it would mean that it would transcend a thought, providing utility to the self and even others. As seen through projects like Ethereum, crypto and blockchain technology have a greater utility than just an alternative means of currency.

The thesis begins with an overview of internet history, contextualized through the terms "sterile" and "generative" technology. This tension is a constant in internet history with blockchain being the "generative" pull away from the more "sterile" server stack model of big tech. "Sterile" technology is fundamentally more centralized and within the context of a digital space like the internet this approach dictates how the space is governed. Both current state and corporate governances are built off a more centralized model, however with blockchain technology, democracy, as well as company structure is being re-examined. Ideas such as stake holder capitalism and open democracy are a similarly "generative" model as opposed to the more centralized "sterile" approach of more traditional democracies. With a space that humans communicate also comes ethics that defines the morals and norms of the space. In a more

centralized model, utilitarian and deontological approaches to ethics have provided a groundwork for a just society prior to the computer. However, the computer, acknowledging the multiplicity of "being", requires an approach to ethics that is more decentralized than these current ethical models. Existentialism, through Sartre's examination of "being", exposes the flaws in centralized ethics through the acknowledgment of human "beings" as being in a constant flux with their "being" being defined by a "being" outside of their own existence; "the Other". This sets the stage to delve into the benefit of a computer system functioning more off a decentralized approach like a blockchain system. Decentralized Autonomous Organizations (DAO) directly tests blockchain as a governing system. Showing the potential for blockchain to create a more openly democratic internet that is defined by the user. Supported by the ethics of existential philosophy, blockchain, like state governance can be justified as a genuine form of governance. While there are drawbacks to blockchain the technology holds a lot of potential of creating the most democratic space in the history of the world.

The History of Internet and "Open-source"

In 1977, Steve Jobs developed the Apple 2, the first at home personal computer. This innovation brought computing out of its sterile, industrialized setting into a more generative environment. Computers sterile existence prior to the 1970s was defined as a machine that could be rented out such as the IBM System 360 (Zittrain, 2008). These machines were used to count the census and made the process significantly more efficient (IBM, ND). However, these machines were limited in capability and access. As computers evolved, innovation was kept to a lab or government facility. Third-party software was not available and public use was limited or nonexistent (Zittrain, 2008). These constraints are what make a technology "sterile." "Sterile" technology is inaccessible. The creators of a "sterile" technology aspires for peak vertical

integration. IBM, for example, rented out their System 360 to organizations and those organizations couldn't modify the device in any way (Zittrain, 2008). All technology in the System 360 was proprietary, so knowledge around the machines maintenance and how the hardware functioned never left the offices of IBM. This changed with the age of personal computers and made a once "sterile" technology more "generative".

Figure 1: An IBM 360. The computer is not only this console but the whole room (IBM, ND).

A "generative" technology allows for much wider breadth of accessibility and encouraged users to be just as much of a developer as the creators (Zittrain, 2008). The computer, becoming a "generative" technology that others could enhance through software or hardware modifications, was essential in the ontology of the internet. The machinations of the modern internet started with applications such as ARPANet (Rosenzweig, 1998). ARPANet was the first network of computers. The network was developed by The Advanced Research Projects

Agency in the late 1960s as was limited and accessible only through universities or the US government (Bartlett, 2018). This network grew with the market for the personal home computer and the popularity of the USENET network in the mid-1990s (Rosenzweig, 1998). This network was accessible by anyone with a modem. Allowing anyone with a personal computer to post information and chat on the various forums hosted by USENET. While chat rooms and forums were popular on ARPANet their popularity would reach new heights with the accessibility of USENET.

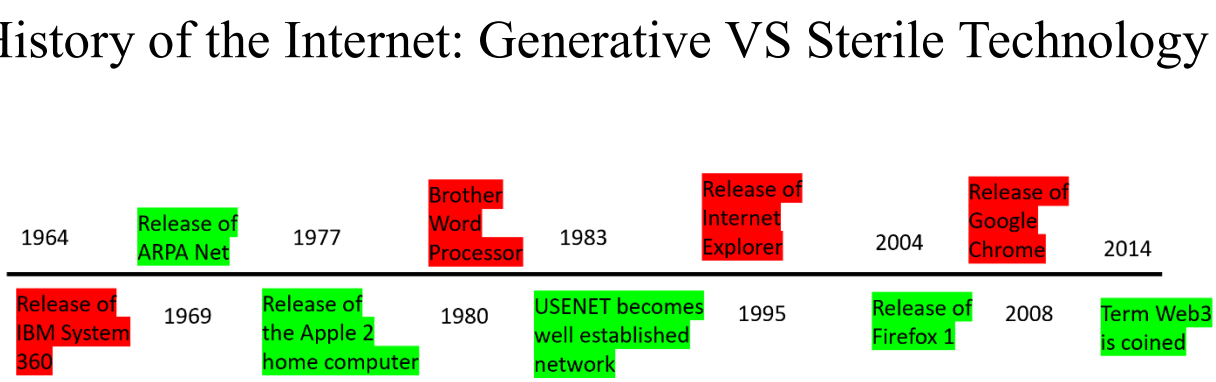

Figure 2: Timeline depicting the tension between sterile versus generative technology.

USENET, in pioneering accessibility to the internet also brought about a more "generative" technological space with user generated "open-source" content. "Open-source" is a "generative" approach to technological innovation since. In the case of USENET, development of content wasn't curated by a central authority, like The Brother Word Processor. This word processor was released in the 1980s with applications pre-installed onto every device (Zittrain, 2008). These applications were immutable outside of how Brother programmed them to function and no other third-party software could be added to the device (Zittrain, 2008). As computer technology grew in popularity and ubiquity, "sterile" approaches were found to be limiting. Developers of computers sought to create computers that could be used by a wide breadth of

professions and individuals. “Sterile” technology in its vertical integration, lacked the means to change itself to meet the demands of our constantly changing reality. “Generative” content was developed to serve users in a more transparent and democratic way. The idea of “open-source’ content is to prevent gatekeeping of the content’s functionality by a central entity. Instead, functionality and the content itself is open to any user. Maintenance as well as innovation were dictated by the users too. An example of “open-source” technology is the internet browser Mozilla Firefox.

Mozilla 1 launched in 2002. Beginning in 1998, the project was a combined effort of the nonprofit Mozilla Foundation and community members that used Mozilla 1 (Mozilla Foundation, ND). That same year, the community released Phoenix. Since the foundation and the community used the same “open-source” Netscape code, that being the coding language in which applications in Mozilla and Phoneix were created, made integration of features from both browsers was easy. Firefox 1 released in 2004, becoming a genuine competitor of Internet Explorer, which facilitated 90% of browser traffic prior to Firefox 1 (Mozilla Foundation, ND). This growth was possible because of Firefox’s “generative” open-source model. Google’s browser Chrome would capitalize on this open-source model in 2008 but as the popularity of Chrome soared to a 70% market share by 2018, the company turned from open web champions into the gatekeepers of Web3 (Shah, 2020). Firefox’s code wasn’t regarded as proprietary with access to its functionality being widely available for anyone interested (Brock, 2019). The substantial fork in the ideology of “sterile” versus “generative” technology is based on developers’ perception of intellectual property.

While protecting intellectual property incentivizes a stronger quality of the properties both in the sunk cost of the property and the limiting access of who can create profitable

intellectual properties (Park, 2010), expenses that are required to produce intellectual property limits who can build on the cannon of intellectual property. In addition, other authors, out of fear of violating previously established copyright, might encourage others to not produce certain works. This tension between keeping copyright protected, but not enough to stifle creativity, is another aspect of the ongoing tension between "sterile" and "generative" technology. While "sterile" technology allows for a more vertically controlled technology it relinquishes the narrative power of the technology to exclusively who originally developed it. "Generative" technology acknowledges that third parties, in being outside the developers' perception, have a great potential in innovating the technology in a way a developer couldn't even conceive.

Mozilla Firefox, using a generative decentralized model of "open-source" created a browser that rivaled the domineering centralized curated approach to an internet browser. In addition, Firefox advocated for democracy, transparency, and the desire to create a digital space where the user can have just as much say as a developer in how the technology functions. The launch of Google Chrome in 2008 would take the idea of user generated content and turn it into a for profit model. With the users of Chrome being the product and their information, aggregated at Google's many server stacks around the world, being sold to any entity wanting to market themselves to users of Google (Warren, 2018). Chrome's dominance would return the internet to a more centralized model. This model wasn't as "sterile" as ARPANET, however Chrome's development in recent years has happened behind closed doors and development rights were reserved exclusively to the employees of Google. This is the current state of things.

The Current State of Things: Ethics

Ethics are what define the conduct of a space. Conduct or the law, such as in the United States, is dictated by the state, which is a group of individuals with an expertise in creating and

interpreting policy. The more "open" the space is the greater the breadth of individuals dictate what is or is not ethical. Democracy is an ideologically "open" form of conduct since voting is a fundamental part of its function. Allowing the act of voting to be accessible to individuals outside of experts is what makes a space more "open." In order to expedite the process, the United States delegates voting powers to representatives who are voted or appointed to office. Delegation is necessary in even the most democratic spaces traditionally because decision making would be too inefficient if every individual was required to vote on every decision. As mentioned above, time in a cyberspace is different than in physical space. Data can be measured and interpreted faster than any sort of individuals tasked with the same task. While the physical world and the internet are connected, time and space are different. Therefore, an ethical practice that has been traditionally successful won't necessarily be successful in a digital space. A place like the internet introduces a new set of ethical variables due to the distortion of time and space caused in a digital space. This distortion, particularly in the speed of how large quantities of information can be processed, creates an opportunity for a digital space to facilitate and be the most "open" democratic space to ever exist.

The democracy of early cyber space is influenced by the culture in which it was conceived. Much of the internet's development occurred and still occurs within the United States. Developers, in coding applications, are influenced by the governance in which they operate under in designing their applications. Aligning morals of a digital space to the physical space in which people take part in interacting with the digital support its legitimacy. If the digital ethics do not align with the ethics of the physical world where it exists, then there is a high likelihood that the people that inhabit both won't use the digital application since it doesn't align with their values. The potential for a digital application to lose value because of ethics

incentivizes internet companies to be ethical since there is a financial deficit waiting for them if they don't.

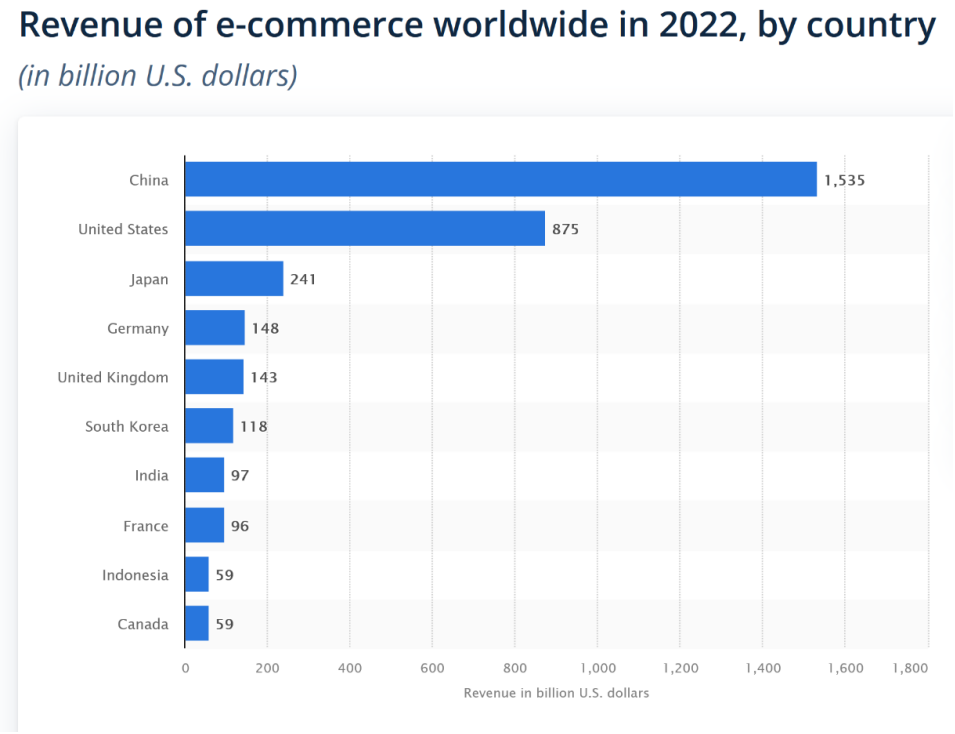

Figure 3: Revenue from E-commerce in 2022 (Chepkemoi, 2017).

While other less democratic nations (e.g. China) have a socio economic impact on the internet, many of the largest internet companies, like Google and Facebook, are based in the US (Chepkemoi, 2017). This means that in order for these companies to operate within the US state that they must abide by the laws of the state. The US, EU, and other democratic states hold a lot of governing power since the value generated by the two is around 50% of the total revenue generated by e-commerce in 2021 (Statista.com, 2014). The US government is particularly important because the internet, as seen in the evolution of ARPA Net to the present, has its origins deeply rooted in the US. Early developers as well as modern day developers of internet

products originate from the US, so values instilled by the state will extend to individuals operating within that state.

Utilitarianism

Organizations develop governance through ideological frameworks. Historically, especially in Western states, there are two notable types of ideological frameworks: utilitarianism and deontology. Both have been significant in developing western democracy and guide the most sovereign of laws in a democratic state. Utilitarianism is the development of morals that will universally generate a "good outcome". Utilitarianism, theorized by John Stuart Mill (1863) and Jeremy Bentham (1789) was the precursor to Kant's categorical imperative. The categorical imperative theorized that through "good" action a "good" outcome will occur. At its most pure, a "good" action is universal, generating a universal good.

Kant's critique of utilitarianism is the action. In utilitarian thought, action, "good" or "bad" is not measured. The measured variable is only the moral product of that action. Utilitarianism can be viewed as a consequentialist philosophy since morality is generated exclusively from the outcome and is ontologically based in a retroactive reflection of the action. In this reflection one must conclude that a simple majority has benefited or netted more "good" from an action then "bad." Majority choice, instead of considering the nuance of the individual views determines of the choice made was good or bad through a more collectivist sense. Viewing morality of choice as a collective strives for the permutation of a "good" action to reach as many individuals as possible and maintain the "good."

Utilitarianism: SESTA/FOSTA and the EARN IT Act

In the US, utilitarianism has had a significant impact on legislation both historical and currently. Two prominent pieces of legislation to come out of the United States Government in the last decade with the rise of Web3 is SESTA/FOSTA and the EARN IT Act. These bills are meant to provide exceptions to protections guaranteed by Section 230 of the Communications Decency Act (CDA). CDA was original written as anti-obscenity legislation. The American Civil Liberties Union found the bill to be unconstitutional, violating first amendment freedom of speech rights. In Reno vs. ACLU the Supreme Court sided with the ACLU keeping Section 230 enacted. This part of the bill provides immunity from liability, placing blame for potentially defamatory statement on the individual that issued the statement, and not the internet provider that facilitated the communication. SESTA/FOSTA and the EARN IT Act attempt to stripe Section 230 of its power after this verdict. These bills target distribution of obscenity involving children particularly in a sexual nature. Sex workers as well as free speech advocates have questioned the implementation of these Acts and deemed them to have a much more negative impact on communities that revolve around open discourse regarding sex online.

SESTA/FOSTA is a bill written by a bipartisan committee of senators that, in short, gives law enforcement more resources to combat sex trafficking online (Dias, 2018). The law had unforeseen consequences resulting in a net negative impact on the decriminalized “legal” sex workspace online. Legal sex solicitation services (e.g. Craigslist) had to close that part of their website, with Tumblr being forced to ban “adult content” altogether (Martineau, 2014). Mainstream websites lack of support of consenting sexual content has marginalized communities such as legal sex workers and LGBTQ members who consider spaces such as Tumblr, significantly safer (Martineau, 2014). In the case of sex workers, many have had to return to the

street, which makes them much more vulnerable to violence (Dias, 2018). If a sexual exchange is facilitated online, then the sex worker has much more options in vetting the client. This opportunity is taken away in a street exchange which creates a much more hostile environment for the sex worker. SESTA/FOSTA was postured as a bill that would attempt to limit sex workers being exposed to such an environment. The bill was short sighted and was created with the purpose to take down Backpages, a website that had become notorious for facilitating illegal sex trafficking.

There is a clear utilitarian framework at play. The demise of the sex soliciting space of Backpages was perceived as demeaning and prurient in nature by US politicians (Dias, 2018). This perception is narrow in both scope and cause and effect. The law was created because of the outcry from Anti Child Sex Trafficking organizations that saw Backpages as a major facilitator of Sex Trafficking, especially minors. In utilitarian's thought, if an action produces a "positive" or "good" result/outcome then the moral produced by this would be considered "good." In developing SESTA/FOSTA the US government went directly after the site Backpages, forcing the site into bankruptcy. In the eyes of the State, this law, in eliminating Backpages from the internet, is considered a "positive outcome" and a success. The problem with this narrative is there are other platforms that facilitate sex. The other platforms have differing nuances that, unlike Backpages, creates a legal and safe spaces for sex. However, if the site seems anywhere close to Backpages model then it receives similar treatment. Creating a precedent that any sites that allow users to communicate about sex are going to be under the heaviest of scrutiny. This is why in the wake of this law, sites such as Tumblr were also shut down. Sites that allow more frank and open discussions of sex are not huge platforms like Google or Facebook. The level of policing that the government required in order to maintain such a space was too expensive and

caused a great silencing from any platform that might allow any topic around sex onto the platform. Instagram, in wake of this law, increased their A.I. sensitivity to the topic of sex so much that even pictures posted of pregnant women were being flagged as sexual content (Jones, 2018). While SESTA/FOSTA's aim was to remove Backpages it is a bill meant to amend the umbrella of protection that internet organizations receive from the Section 230 Communications Decency Act (CDA). Shortly after this law was signed another law seeking to amend CDA was written—this was the EARN-IT Act.

The Communications Decency Act was created so web platforms were free from any liability regarding what users said on their platform (Newman, 2020). Building off SESTA/FOSTA, the EARN IT Act further limits websites clemency to legal action. The law, proposed by Senators Lindsey Graham (R) and Richard Blumenthal (D), will force websites to "earn" their 230 CDA protection, rather then it being granted to them. Stopping the circulation of exploitative images of children was also the impetus behind the EARN- IT Act and the law had a similarly narrow impact if any at all. Websites are already required by 18 U.S.C 2251-2260A), which states that a website must preserve any communication involving child sexual depictions and liable for the communication if they do not(Eoyang Garcia, 2020). A typical user on a platform views sexually explicit images of children and terrorism as media that shouldn't be spread on any online platform. However, regulators cannot mitigate media and digital communications online based the most extreme members. The results are narrow regulations that at best stop the practices of the particular entity that caused the law to be formulated in the first place or at worst, infringed directly on the rights of law-abiding U.S. Americans.

Deontology

Deontology, developed by Immanual Kant, differs in that the “good” of the action comes from how much “good” influenced the action to occur. With deontology, the “good” is determined more by the total narrative of the action instead of just the value generated by the action. “The good” must be constant. Unlike utilitarianism, deontology doesn’t see every action as a means to an end. “Bad” action, even if creating a “good” outcome is not a deontological approach. In terms of time, deontology is much more relative and attempts to be a more dynamic philosophy malleable to times impact on a decision. Being more relative in philosophical reasoning is positive in its acknowledgment of cultural differences but this acknowledgment comes at the cost of efficiency.

The UK/Europe use a more deontological framework to develop legislation around technology. Deontology is less concerned with outcome and more concerned with the narrative. Rather than establishing the “good” through the product of an action, deontology attempts to be more preventative rather than reactionary. A deontologist must perceive each action as “good" leading up to the outcome which produces the moral. In 2022 Amnesty International brought a case against the UK citing their cyber laws being a human rights violation (Amnesty, International 2022). In 2016, the UK passed legislation that required citizens to provide a credit card in order to access pornography known as the Digital Economy Act (Ehrenkranz, 2016). While Amnesty International didn’t cite explicitly that this was the law that brought about the case. The Digital Economy Act encourages a far likelier possibility of a list of everyone’s porn history, attached to their credit card, being exploited in an attempt to make accessibility to porn sites more traceable. Parliament’s justification for the act being that it would bring about swifter justice to pornography that abused the performers. The UK is creating a weakened encrypted

space with this act. The liberties of the many shouldn't be diminished because of the few. Child abuse content, terrorism, drugs; these are what dictate legislation but are a minuet part of the search traffic in any browser space. The error in this deontological framework is the "good" is determined through a limitation of rights (Stelzig, 1998). In placing priority in the "good" the rights of the majority were limited because of fringe ideologies. While the "good" of an action is determined by how much malice it stagnates the perception of what is "good" is relative to the individuals that carried out the action.

While a deontological perception has much more baked in relativism as opposed to utilitarianism, this relativism is attached to "Being-for-itself." The ontology of a deontological framework fails to recognize "the Other" or the "Being-in-the-world" until the action of the individual either aligns or doesn't with the action of "the Other." Deontology escapes pitfalls of consequentialism, like an immoral action still creating a morally sound outcome, but perception of "good" does not escape the perception of the perpetrator of the action. A decentralized system introduces significantly more opportunity for individuals, especially of varying perceptions, to encounter each other. In encountering "the Other," one's ideology is tested so that the ideology can stand outside of the individuals that established morality.

The Current State of Things: Centralized Governance

Organizations that are controlled through a centralized form of governance are structured with an individual like a CEO or a president holding the most governance, followed by groups, in the case of a democracy, of delegated individuals whose purpose is to govern and amend the system as necessary. Companies and governments that integrate some degree of democracy utilize this dynamic to provide a system of checks and balances. In the context of the US government this is done through different branches of government. Each branch has selective

powers, that keep the other branches in check. There is a similar dynamic in companies as well where a person like a CEO has a high level of governance but is checked, by shareholders through the system of checks and balances.

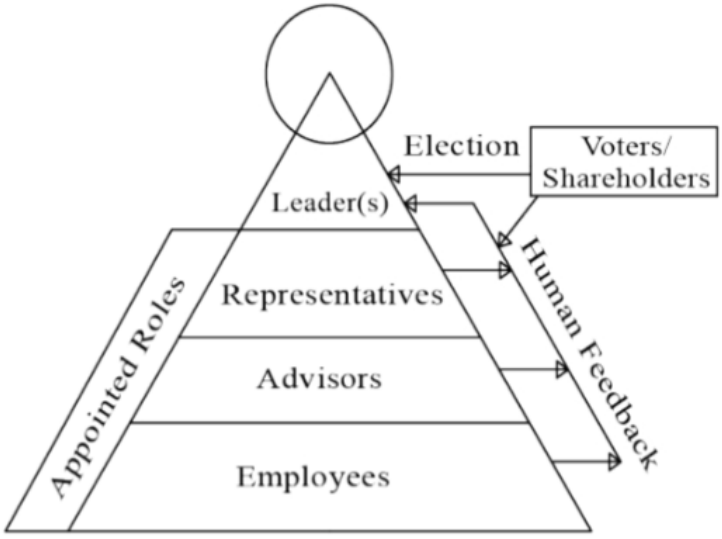

Figure 4.1 The diagram above depicts how centralized governance functions in a corporation (Mcfarland, 2021).

An organization is broken down into various roles with employees being the largest populace of people in the organization and hold the least amount of governing power per individual. The pyramid structure visually represents governing distribution with a concentration of power placed at the apex of the pyramid with the highest level of leadership. This distribution of power is checked by the voting populace. As depicted in Figure 4.1, the voting populace is the ether that surrounds the organization. While roles such as representatives waver from democracy to democracy in how they're appointed, the highest position of leadership is determined directly by the voter or in the context of a company, a shareholder. Shareholders are people who have a

stake, typically represented in shares, of the company. These people, while having a direct impact on leadership have a tertiary impact on other parts of the organization.

A shareholder's tertiary impact is shown in how employees drive organizational success. While the definition of a shareholder is typically defined as a member of the board with a high stake in a company, a shareholder, in broader terms, is anyone that owns a piece of the company. This idea of a stakeholder is foundational in what is called stakeholder theory or stakeholder capitalism (Freeman, 2009). Using Apple as an example, anyone that uses an iPhone has stake in Apple. Stake can be defined as one's investment into an entity. In cases in which the company is publicly traded this can be measured in ownership of shares. More broadly, a stake is defined by how much time an individual devotes to something. While time itself doesn't necessarily contribute to the value of something, a person, in contributing their time shows the value they see in the thing; creating an opportunity for another person to see the potential value of the thing. A stakeholder, to align with blockchain, is anyone that possesses any sort of intellectual property created by the developers, in this case Apple. While a person that owns an iPhone has a far less stake in the company then a shareholder defined in business terms, they have stake none the less.

Shareholders are why the necessity for strong a human resource division (HR) in a company is so crucial. A study exploring Human Capital Practices and Employee behavior found a stronger correlation between past HR practices and future financial performance than past financial performance and future HR practices (Cohen & Pfau, 2003**)**. The study uses a value driver model, defined by these values:

• Setting the course: Developing and executing strategic initiatives.

• Mobilizing talent: Mobilizing people to achieve key business objectives.

• Generating revenue: Realizing top-line growth.

• Running the business: Increasing profitability and shareholder returns.

What a value driver model attempts to integrate is a transparency of organizational goals that everyone, from employees to management, is working toward. This study supports that growth is not only achievable but is exponential if these values are applied to a centralized organization. What centralization offers is an out for organizations who do not want this sort of transparency between hierarchal positions. In a decentralized system this component is inherent and unavoidable, which brings more inherent democratic integrity to the system at the onset. However, centralized systems, such as the US government, have been able to maintain democracy through varying degrees of law. From more immutable law, such as the Constitution, to law developed through legislative debate and consensus.

How a centralized democratic organization cultivates legitimacy is through a dynamic of accountability to democratic principles typically defined in a document like the Bill of Rights and/or a constitution (as in the case of the US government). Organizations maintain this dynamic through concepts such as separation of powers, transparency, and abiding by the law (Birchall, 2013). Within the US government accountability is done using the US constitution as framework for all law within the United States. Leaders and citizens alike have to follow the constitution. A group or individual attempting to subvert constitutional rights will face consequences. In addition, the US Constitution is a public document, which means in theory, any person can read the document. The accessibility of the constitution is an attempt at creating an organization where every person has some sort of understanding of how the most fundamental laws of the space function. This dynamic allows for accountability to be upheld on every level of governance through mutual understanding of the most core laws of the space.

TABLE 1. Models of Democracy

	Assembly democracy (5th/4th century Athens)	Electoral democracy (18th–20th Century)	Open democracy (21st Century?)
1. Inclusiveness	Universal relative to demos: All free, autochthonous men within the city-state	Universal relative to demos: All nationals (blood line or right of soil)	Dynamic: Universal relative to demos but also at least partially inclusive of other affected interests, including across national borders (see chapter 9)
2. Equality	Equality before the law	Equality before the law	Equality before the law
	Equal opportunity of access to agenda-setting		Equal opportunity of access to agenda-setting
	Equality of right to speak	Plural voting to voting equality	Equality of votes
	Equality of votes		Substantive equality (see chapter 8)
3. Rights	Participatory powers (equal voice, equal vote, equal opportunities to be selected for the council and popular juries)	Political rights, e.g., voting rights	**Participation rights** (beyond political rights: citizen's initiative; right of referral, right to participate in political lotteries)
		Freedoms of association, speech, religion, etc.	
4. Discursive process	Public speeches, mostly by gifted orators	Trial by discussion	**Deliberation**
5. Decision rule	Shouting, murmuring, majority rule	Majority rule tempered by supermajority thresholds and checks and balances	**Majoritarian principle** (majority rule, majority judgment)
6. Representation	None (mainstream view)	Electoral representation	**Democratic representation**: lottocratic, self-selected, liquid
7. Participation	Intense and mandatory for some	Limited and episodic (mostly voting)	Regular (mini-publics, top-down referenda) and at will (citizen's initiative, referrals)
	Episodic but regular for others		
8. Accountability mechanisms	Screening of candidates, rotation, ostracism, *graphe paranomon*, *euthynai*	Elections, courts	Courts, rotation, **transparency**, participation rights such as citizens' initiative and right of referral

Figure 4.2: A comparison of three forms of democracy defined by eight factors (Landemore, 2020).

The table above provides a comparison of models of democracy throughout history. While democracies such as an assembly democracy are seen as less inclusive, (Landemore ,2020) argues that while there were drawbacks to older forms of democracy, that the barrier of entry into acquiring governance was more accessible. The sections on equality and rights in the above table is where (Landemore, 2020) breaks down the perception of equality and participatory powers in an assembly democracy. Equity, in terms of the voting populace, was much more of plateau. This meant that decision making in society wasn't limited to a privileged demographic. While electoral democracy is more inclusive in terms of voting rights, the ability for every member of the society to gain access to instances of voting outside of local initiatives,

local and state officials, and head of office (the President) is significantly more challenging then in an assembly democracy.

Electoral democracies' barriers to policy making are far higher in an attempt to specialize voters who have greater plurality in voting, such as a member of congress or a Supreme Court judge. In creating a populace of expert voters, electoral democracy creates a more efficient democracy, sacrificing accessibility for expertise in how the state or organization functions. In the United States, citizens vote for politicians, who are delegated to vote and amend United States law. Politicians maintain legitimacy by abiding by two concepts of legitimacy: procedural and substantive (Colognese, 2007**)**. Procedural legitimacy is the upholding and understanding that the voting model in place continues to be democratic. Substantive legitimacy is the understanding that delegated officials will abide by the laws that govern the system and will not use their position to step outside of the law. Corporations under democracy function in a similar way however this legitimacy is not as strict since corporations are a separate entity from government. However, they must operate under a governments dynamic of maintaining legitimacy.

In the United States politicians are delegated to vote on most policy changes from local to national. A corporation follows a similar managerial pyramid structure (as depicted in Figure 4.1). Employees are the bottom, with varying degrees of management building to the highest position in the company, CEO. To maintain procedural legitimacy, corporations establish a separation of powers that maintains checks and balances similar to a democratic government (Colognese, 2007). Other stakeholders, like someone on the board of directors, have the means of amending or vetoing the CEO. Stakeholders, similar to the United States have varying degrees of power, with individuals on the board have to hold a significant amount of share or a piece of

the company. A stakeholder also has hierarchies with individuals dubbed as “shareholders” at the top to someone that owns one share or even a company’s product (if applicable). Consumers, similar to employees, have power in numbers. Typically, they are the company’s bottom line and proven to have a positive correlation in future gains (Cohen & Pfau, 2003). However, an employee doesn’t have the right to vote. Voting within a corporation is reserved to individuals with significant equity; owning part of the company. These people are known as shareholders.

Corporate governance is far less democratically open then a state such as the US. Voting is not a precedent for most decisions made in a corporation. The laws established by the corporation can be developed in a vacuum by the highest governances with little to no consensus from employees or lower stakeholders. While consumers, employees, and lower management have rights. These rights are enforced by the governments in which the companies operate within. This is why a lot of manufacturing has been moved outside of the US to countries with looser labor laws; the cheaper the employee, the wider the margins. However, as seen with clothing companies such as Adidas and Abercrombie who were implicated in the forced labor of Uighur’s in northwestern China (Paton & Ramsy, 2020), involvement in slave labor, no matter how cost effective, had an impact on the company’s image which impacts their economy. This dynamic of accountability is more indirect then between a state and its citizens. The pool of individuals with voting privileges in a company is significantly smaller than a democratic state. The distribution of power is far more centralized, with democratic values being enforced by individuals outside of the company such as politicians or activists. The legitimacy that corporations uphold is mostly substantive since voting within a company is conducted at such a small scale and only with individuals who hold a significant amount of governing power.

The consolidation of governing power in a corporation comes from its centralized structure and its lack of procedural legitimacy in order to function. Lacking procedural legitimacy improves decision making efficiency at the cost of democracy. In a decentralized system, like blockchain, each decision is scrutinized significantly more. This is because the act of decision making is accessible by the whole system with more opportunities to vote than even in an assembly democracy. In an open, decentralized democracy, legitimacy is not only established through procedural and substantive legitimacy, but radical transparency is also essential. Mutual understanding of how the system functions extends to everyone regardless of governing power. Transparency is a necessary part of democracy and especially apart of one that has a higher frequency in instances of voting like blockchain.

Reciprocal Imbrication of Being: Existentialism

Existentialism is a philosophical movement critiquing traditional philosophy, seeing early philosophers, such as Kant, as overly academic, superficial, and too removed from experience (Kaufman, 1956). While the authors attributed to existential thought define differently or sometimes outright refuse to define existentialism. This school of thought sees modernity as over valuing intellect (Book Club, 2022). “Being” comes from both action and thought. A “truer” intelligence is informed by the world and not just introspection.

Jean Paul Sartre, a well-known existentialist, defines “Being” in three relationships: “Being-in-itself”, “Being-for-itself”, and “Being-in-the-world.” “Being-in-itself” is a being that is not self-referential. An example of a being could be chair, an unconscious object, or a human’s subconscious, which cannot be imposed on directly by Being. Being that is affected by intellect and cognitive processes is known as a “Being-for-itself.” This Being is affected by a human’s will. Aspirations, thought, and ideas around how a “Being” should conduct themselves propels

the self into existence. “Being-for-itself” is the abstract “Being” that collides when experiencing the world with the reality of “Being.” The reality that their “Being,” to some extent, is affected by the world; by a “Being” outside of themselves, a “Being-in-the-world”.

There is a “Being” that can never be known to an individual’s perception and that is “the Other” (Sartre, 1943). One can, through time, acquire knowledge of “the Other” but one’s understanding will never be absolute. Someone uses a chair to sit. A chair’s ontology, through language and experience has an agreed upon understanding: that it is a chair (Sartre, 1943). “The Other,” in a glance, cannot be fully apprehended unlike a chair in one’s perception. “The Other’s” complexity and dimension is unimaginable; impossible to fully perceive, unlike ourselves. That is why our perception renders them an object initially. Requiring additional intellectual processes to perceive their humanity.

A person passes another walking down the street (Sartre, 1943). They glance at each other. The cognition that occurs is a person walked by me. However, a person in this context is a body. There must be more cognitive steps taken to render a person as having a family, a job, a partner, a life. But this “life” can never be fully understood. There is always something about one’s life that another, no matter how close they are, will never know. There will always be lives in “Being-in-the-world” that will never cross our perception.

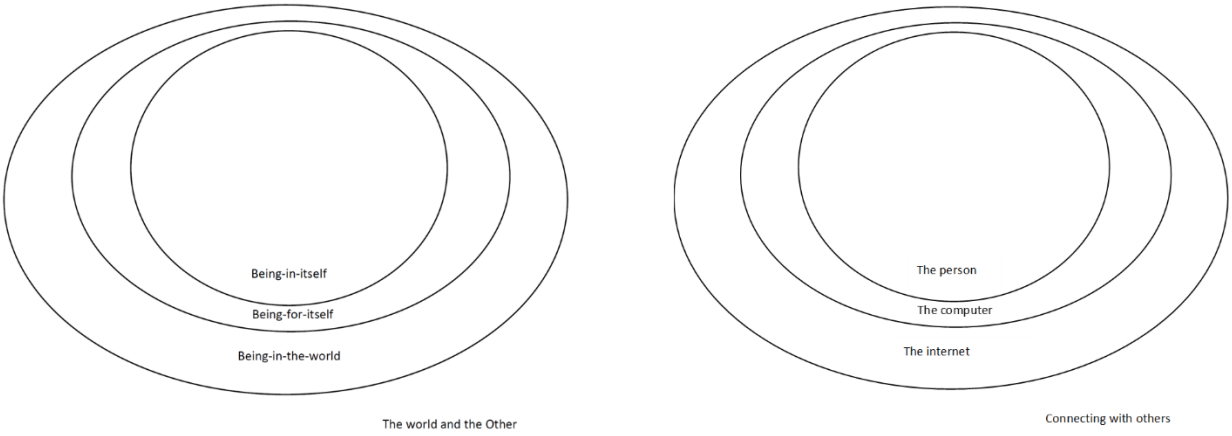

Figure 5: A “Being’s” relationship to the physical world on the left and how a “Being” connects in a decentralized digital space on the right.

There is always a multiplicity of “Being” which is a driving force for a being’s internal conflict. This conflict, before expressing itself in the world is part of “Being-in-itself.” This is the self that can never be fully expressed. A “Being” that is unable to be self-referential. The “Being” capable of expression is a “Being-for-itself.” This “Being” is enforced by cognitive thought rather than the subconscious. “Being-for-itself” is curated, similar to how one can curate themselves online however in solitude there is a lack of “Being-in-the-world.” “The Other” is not present in real time within a digital space. Time is distorted. This distortion allows for humans to develop computational methods to analyze information at rates no human could comprehend. There is potential in computational systems to devote this analysis to creating a more democratic system of governance while maintaining the efficiency needed in modern day infrastructures. What blockchain acknowledges is the “Being-in-the world” even if the “Being’s” relationship to time has been abstracted and, in many ways, perverted in experiencing a digital space. This phenomenon manifests in the world of pornography consumption. In isolation one masturbates, this is what pornography facilitates. While this isn’t always the case, pornography rarely is a

facilitator for sex, and is typically present when there is a lack of sex. Sex happens "in-the-world." While pornography occurs in the world, through video editing, the hyperbolizing of sex, and the capital in which it creates distorts the truth of the sex occurring on the screen to that of fantasy. The curation of "Being" and the distortion of time create a different and unique way of "Being." Morality, therefore, should not be created from norms that attempt to centralize thought. In a decentralized system, existentialism upholds the systems fundamental nature through perceiving reality as a constant state of flux between "Being" and objectivity, the nothingness.

Blockchain accounts for this flux of "Being" and nothingness in its use of a decentralized ledger. Voting is a way of measuring perceptions of people. After a public vote, most decisions are made by individuals in government. Their decision-making left to their perception alone. This is where the flaws in more traditional forms of ethics become more obvious. Deontology for example dictates that if all actions leading up to the decision are "good" then the decision will be "good." This idea of "good" is determined, in a democracy, by lawmakers. The "good" in this context was informed by a narrow sampling of individuals who are similar in nature and experience. Deontology doesn't retroactively account for an action that was found to not be as "good" as previously understood. Because of the relativist quality of deontology, decision making is individualistic with consultation of "the Other" not even being necessary to establish if an action was good or bad. If "the Other" were to come to the deontologist post action and state how the action negatively impacted them, then the action, in violating an individual's rights, brings into question if it was a "good" decision at all.

Utilitarianism, to avoid narrow perceptions of the "good," measure morality through the majority. While majority rules accounts for a wider breadth of perceptions there is still the

minority. In utilitarianism the minorities perception is subverted to accommodate the widest breadth of perceptions that maintain a similar idea of "good." This definition of "good" is not true to every "Being" nor does the minority "Being" have any recourse in amending this idea of "good" to align with their "Being." While utilitarianism accounts for a "Being" outside of the self there is still a denial of "Being" in order to conclude something as "good" or "bad."

The flow of reality isn't acknowledged in the philosophy of deontology or utilitarianism. Reality is impacted by both what a "Being" knows and doesn't. The goal of these philosophies is to arrive at a categorical imperative, in the case of deontology, or what is best for the greatest number of people. Determined through redundant action that constitutes as "good" or an end result that is, through a privileged consensus, deemed "good." These moral aims are too narrow in scope and fail to account for how a system will inevitably confront deviations from the prerequisite. Failing to account for how they will amend what is deemed "good" when a perspective, that was unaccounted for in the deliberation of the "good" is reveled, are the drawbacks of Kantian thought. Thought in Kantian terms, becomes centralized, since Kant wants to generate an ethics that is universal.

The Constitution is a document created to protect more abstract rights, such as freedom of speech. The First Amendment is an attempt at establishing a universal principle, however speech changes, especially with technology like the internet. Kant didn't have these powerful tools of communication during his life so the ontology of the philosophy of utilitarianism or deontology doesn't account for how "Being" can be developed outside of "Being-in-the-world." "Being" can be found through technology and the realization that reality is composed of mechanical processes both organic and inorganic (Deleuze & Guattari, 1972). These processes

are the foundation of “Being.” Where they occur and how they occur determines what “Being” is expressed; “Being-in-the-world”, “Being-for-itself”, or “Being-in-itself.”

In a decentralized system these mechanical processes are checked and approved by every individual in the system. This is the ethical potential of a technology like blockchain. In the case of Bitcoin, each transaction is bounced through every node to confirm the transaction is legitimate and then everyone’s ledger is updated. In this context there is no unaccounted-for party within the system. The presence of “the Other” is both acknowledged, and the system attempts to apprehend “the Other.” In turn, this system is inherently more open in terms of democracy because every decision is dictated not by a privileged majority but by the whole system with the process of delegation corresponding with an individual node, in the case of blockchain, in every decision.

Existentialism is the only philosophy that acknowledges “the Other” at an ontological level. Each “Being” is complex and has a unique history that cannot be expressed in something like a “net positive outcome” or “good actions.” A system built around deontology and utilitarianism are based on the lawmaker’s perception of what the “good” is. Current systems of government are not informed in a concreate way by the inhabitance but by a hegemony instead. Blockchain has the potential to be malleable and its consensus be based on a multidimensional present that extends past a privileged group of individuals that determine “the good.” It is also not static in its perception of what is “good” and can accommodate an unaccounted-for perception in the future.

The New Flesh: Blockchain

Decentralized finance didn't start with blockchain. Long before computers there was a south pacific tribe called the Yap. The Yap people had a unique type of currency; large immovable stones called Rai stones (Ryan & Donughe, 2017). The stones were circular with a hole in the middle that varied in size but were typically around a couple thousand pounds. So instead of moving them every time an exchange was made, each tribe member had their own ledger which, like blockchain, was reviewed, evaluated, and approved by everyone else's ledger in the tribe. This review prevents fraud and upholds legitimacy through collective integrity. However, in Western culture the Medici way of finance, through a singular centralized ledger held by an accounting institution, has been the standard until the creation of Bitcoin in 2008. Bitcoin would take a decentralized ledger and computer technology to develop the first cryptocurrency ushering in the era of Web3.

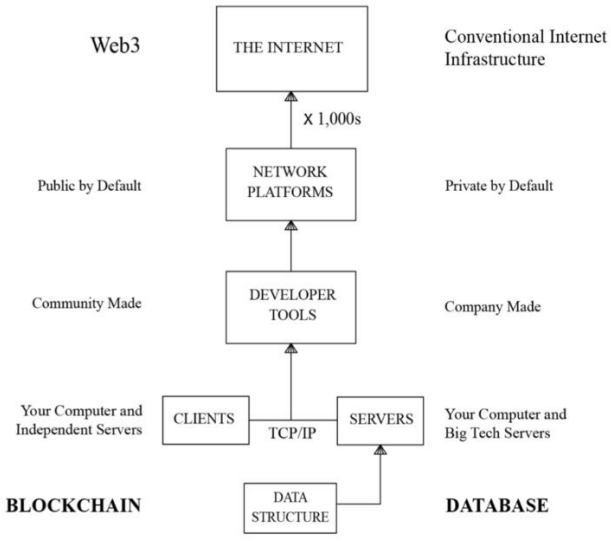

Figure 6.1: Depicts a blockchain infrastructure verse traditional database model (Mcfarland, 2021).

Bitcoin was conceived in a response to the Medici form of banking. The defining feature being the centralized ledger. Unlike the Yapense people, the integrity of ledger was not endowed by the community but by the institution that maintained the ledger. Advocates for blockchain see these institutions as being powered exclusively by self-interest and only want to retain central bookkeeping of transactions in order to profit off of every transaction. This sentiment would only be magnified by the 2008 recession which correlates with the release of Bitcoin by Satoshi Nakamoto (Bartlett, 2018). Early adapters of the internet were also founders of crypto currency (Macfarland, 2021**)**. This group was called the "cypher punks" who were known for their anarchist interpretation of the internet with another one of their notable contributions being the nonprofit Wikileaks. A notable achievement of WikiLeaks was the leaking of documents exposing the unconstitutional intelligence practices of the United States government by Edward Snowden. The Cypher punks saw a similar value in blockchain as they did in the early forms of the internet: a decentralized system that placed values of freedom and autonomy as the highest principles. Bitcoin carried these values into a financial context, creating a system of individuals that can, using computer processes, solve cryptography and through a time over value scale, acquire more and more currency with scaling of cryptographic strength being proportional to the market size. The larger the market, the harder the encryptions will be to solve in order to produce more Bitcoins. The recording of these computations is put on a blockchain. A block is a piece of code that has been verified by every individual's ledger on the chain (Sanderson, 2017**).**

Group	At launch	After 1 year	After 5 years
Currency units	1.198X	1.458X	2.498X
Purchasers	83.5%	68.6%	40.0%
Early contributor distribution	8.26%	6.79%	3.96%
Long-term endowment	8.26%	6.79%	3.96%
Miners	0%	17.8%	52.0%

Figure 6.2 Ethereum's scalability (Ethereum, 2022)

Blockchain has two unique assets to its function: the distributed ledger, and cryptography. A distributed ledger is a document that contains all the transactions within a given system. Unlike a system involving a bank, a distributed ledger is owned by everyone participating in the system, not just a central authority (Ryan & Donohue, 2017). When a transaction is made, everyone in the system has to validate the transaction and update their own ledgers. In the case of blockchain a network of nodes, which are represented by Bitcoin "miners," validate and time stamp transactions, receiving Bitcoins in return for their "mining" (Ryan & Donohue, 2017). While a decentralized ledger isn't necessarily a brand-new concept in the financial world, its merger with cryptography is what makes blockchain unique. Cryptography is enforced through two schemes: a digital signature and a hash functions. A digital signature is created through the relationship between a public and private key. Each transaction has both. The public key is attached to the distributed ledger validating the transaction, while the private key allows for the individual who possesses both the valid public and private key to use the Bitcoin in their digital wallet (Ryan & Donohue, 2017). If the public

and private keys don't match, then the transaction is invalid. Hash functions are what validate the transaction within the context of the ledger. This is done by determining the output of everyone's ledger in the system. If everyone produces the same output, then the transaction can be validated. What a distributed ledger and cryptography do is create a system that doesn't need a central authority to validate transactions but instead have a network of individual computers evaluating all the communications in the system.

The release of the Ethereum project in 2014 would elevate blockchain technology outside of finance. This was done through the concept of SMART contracts. SMART contracts are code that determines how a blockchain will function (Buterin, 2014). Smart contracts are the "tokens" of the Ethereum network. A token, in crypto, is the code that is packaged and traded. The currency of a blockchain network. The innovative feature of SMART contracts is the packaging of code with the purpose of governance (Bueterin, 2014). The blockchain is recording decision making by the nodes in the system instead of financial transaction. This is how the blockchain becomes built around not just trading of a token but a token that holds stake in how the system is governed. This is where the idea of blockchain is a regulatory function emerges.

Ethereum has also been progressive in switching from the traditional proof of work model of verifying transactions to proof stake. The proof of work verification process checks ledgers that have more work (i.e. a miner's ledger). This is because a miner has delegated more computational power then someone who is exchanging crypto currency. Proof of stake is determined by individuals who stake cryptocurrency as collateral on a block being added to the chain (Chandler, 2022). The person endorsing or voting on this block to be added to the chain are rewarded with new crypto currency if the block is added. Proof of stake is considerably less impactful on the environment since it requires less computing power (Chandler, 2022). Opting

for the computer of a blockchain to judge legitimacy of an approval based on individuals' liquidity rather than computational power. While environmentally friendly, critics claim that proof of stake centralizes the blockchain too much, which can be seen in the case of Lido, a staking service that allows users to circumvent Ethereum base requirement on staking, that being 32 Ethereum (Young, 2022). This service currently holds one third of liquidated Ethereum thus giving the entity a lot of governing power in a proof of stake system. Critics of proof of stake believe that in staking a block rather than following a proof of work model is the very antithesis to a decentralized network (Young, 2022). Placing governing power in the hands of the rich rather than an individual who has the technical skill to have a computer that approve transactions across the whole system.

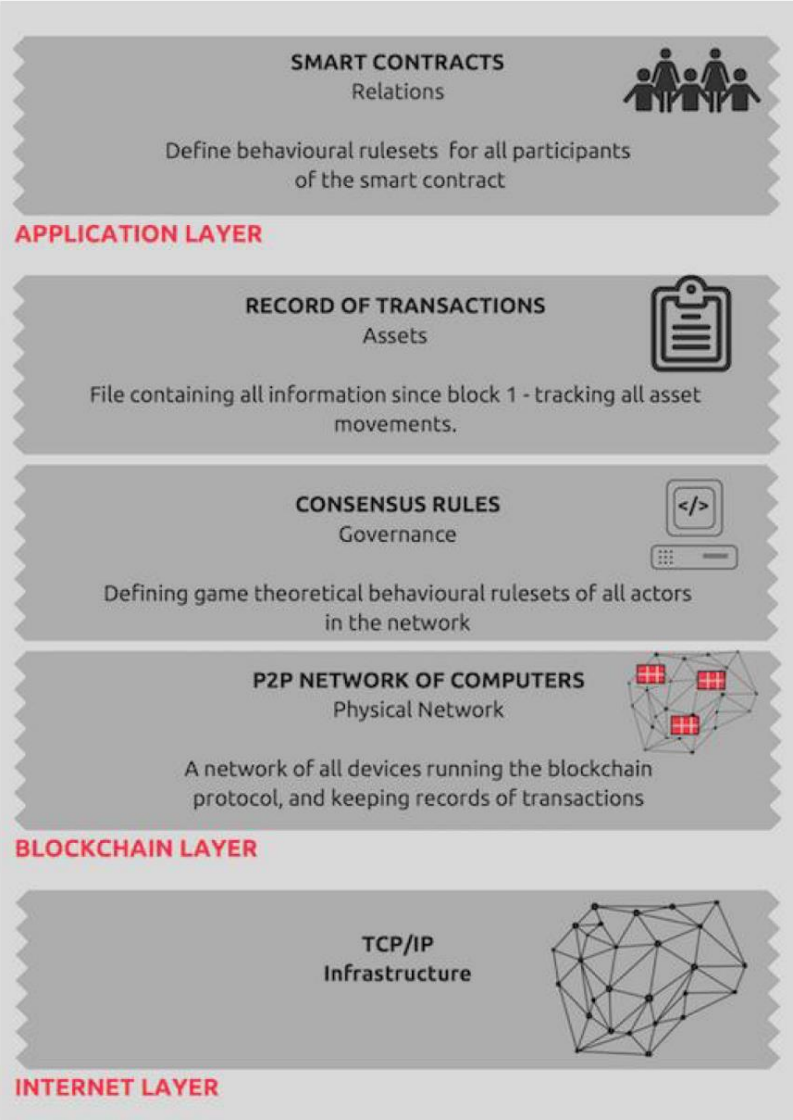

Figure 6.3: Depicting how a DAO functions from its most base application layer to its release onto the internet (Barba & Kondova, 2019).

While Ethereum's technology is cutting edge it is not without its downsides. Once added to the blockchain, SMART contracts are unable to be changed. Development of SMART contracts have to be extremely thorough, and it is in this stage where hackers typically find a way to exploit the blockchain since the code, once released, is immutable. A bug in the early stages of

a DAO, an application that can be developed on the Ethereum network, is what typically cripples a DAO. Regardless, DAO's are a fascinating innovation in decentralized technology that have potential to develop a more democratic and realistic ethical standard for communities online.

The New Flesh: A DAO

Ethereum is unique because not only can it be applied as a cryptocurrency, but it can be used to develop projects that extend past financial application. These projects are referred to as "Decentralized Applications" or "Dapps" (Buterin, 2014). A Dapp can be conceptualized as an application like apps on a service like Apple's app store except the app was designed instead by SMART Contracts and not a traditional coding language like C or Java Script.

A popular type of Dapp is called a "Decentralized Autonomous Organization," or a DAO. A DAO, instead of creating an exchange for cryptocurrency, creates a type of token called a governance token (Buterin, 2014). This token provides a stake hold in the project. The more computational power or time spent building the project the greater the stake hold one will have in the project. Governance in the early stages is generated typical through the project's development. The developers create the SMART contracts or SMART protocols that'll launch the project onto the Ethereum network. SMART contracts are a set of conditions and actions that the blockchain project executes (Buterin, 2014). If the project was built well, then the coding of the project will align with the creator's explanation of the project. After the projects release, governance can be developed outside of the development team and early investors of the project. The release of the project is where the robustness of the DAO's code come into question.

Development of the first DAO is what created the first substantial fork in the Ethereum blockchain. A fork is a phenomenon that occurs when an error is discovered in a SMART

protocol for a DAO. This occurred in 2016 upon the first DAO's release called "The DAO." A hacker exploited a bug and forced the Ethereum community to effectively ditch the older design of Ethereum for a new one that fixed the error (Popper, 2016). This forced a new blockchain to be developed. However, it is still in the hands of the community weather to ditch the old block chain and join the new one or to stay. This created Ethereum Classic, the blockchain with faulty code, and Ethereum.

Both Ethereum's suffer from issues in scalability. Scalability has to do with the speed in which nodes can process a SMART contract. SMART contracts are rigged in their function so coding for this issue is purely abstract since the experience of traffic can't really be tested until it occurs. In addition, as the blockchain grows the SMART contracts code becomes a more complex package to unpack. The more transactions, the bigger the ledger, which means the machines that have to process the information have to become more and more powerful. This also takes time resulting in slow transaction rates and approval periods as the blockchain scales up.

A recent project trying to fix Ethereum's issues in governance and scalability is a project called Dfinity. What is unique about Dfinity is its computer. A computational system that utilizes blockchain includes people, a token, and a computer (Barba & Kondova, 2019). In the context of both Ethereum and Bitcoin the computer is basic, and its functions are limited. Ethereum offers other applications outside of trading tokens, however these applications share the same space as miners, traders, etc. There is no process to delegate resources and influence of governance doesn't extend past the DAO's space, yet the efficiency of functions within a DAO are dictated by the totality of the Ethereum network. Dfinity hopes to solve this issue by developing a more complex computer.

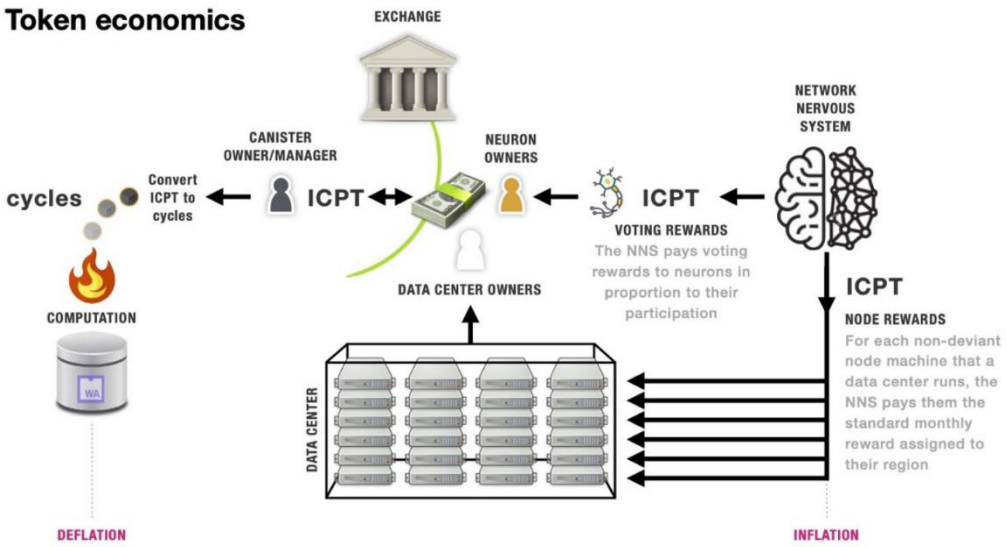

Figure 7: How governance tokens are created on Dfinity (Williams, 2022).

This "computer" in IT is referred to as a stack. How Dfinity improves Ethereum's stack is through nodes relation to each other. Dfinity groups nodes into shards. Shards are a grouping of nodes based off subnets of canisters (Williams, 2022). Canisters are Dfinity's version of a SMART contract. Using the computer as a tool for delegation, Dfinity groups likeminded nodes using an AI that interprets a shards decisions based off the composition of nodes in the shard (Williams, 2022). This improves both the speed in which consensus can be reached and scalability since every decision isn't made in real time by a real person. AI informed by a blockchain infrastructure means the AI is open sourced rather than a trade secret. A decentralized network guarantees this phenomenon. Instead of a concentration of governing power to certain individuals, there is a transparent and more open or liquid form of governance.

The New Flesh: Blockchain Governance Open Democracy

Blockchain's governance is inherently more liquid in its democracy because of the radical transparency the system requires. While hierarchal models come into play in the

blockchain sphere, the technology has the potential to have consensus be done concretely and in wider breadth then a centralized system. Unlike traditional forms of governance adding blocks to a block chain can only be done if everyone's ledger is the same. While this is an automated process, it is not facilitated by a complex computer like AI, but instead a protocol developed and maintained by individuals in the system.

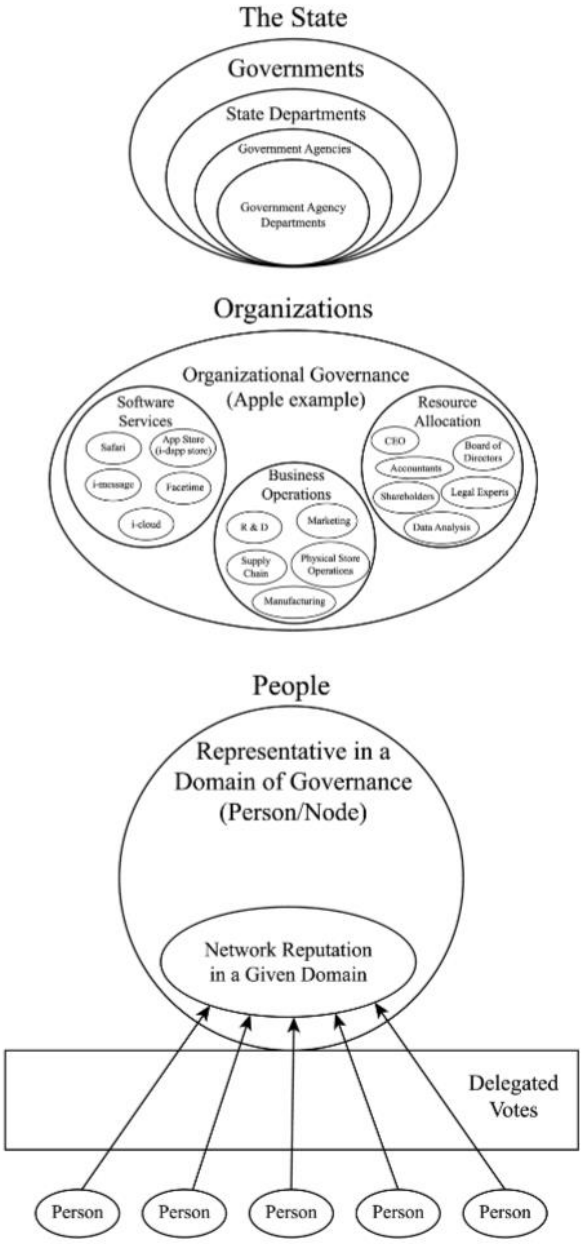

Figure 8: Charts that explain how different forms of governance work (top down) from a centralized state governance, to a traditionally ran business, to blockchain governance (Mcfarland, 2021).

UNI swap for example is a decentralized exchange. Trading crypto through UNI swap also allows a user to acquire governance tokens. The more trading one does on the exchange the more governance tokens they get, which gives them more power in the event of a proposal being proposed to the community. A proposal requires an individual to provide a thousand tokens in addition to needing twenty-five thousand tokens in participation. If a proposal makes it past this stage, then the proposal would need fifty thousand tokens in participation before bringing the proposal to an on-chain vote. An on-chain vote requires two and a half million governance tokens for the proposal to be committed to the blockchain (Uniswap, 2022). Prior to an on-chain vote, voting and who was doing that voting were detected by their level governance in the system.

Similar to voting in the context of the United States, in the act of voting on a blockchain, especially around policy, votes are typically delegated to a representative. Delegation is essential and occurs regardless of the rigidity of the democracy. In a centralized system delegation is determined less by individuals and more by where on the pyramid the power to set the agenda lies. The more influence a group has the smaller and harder to access. Therefore, only a certain specialized individual will be able to gain access to the upper echelons of power. In the context of a decentralized system, delegation is an "opt-out." In the case of UNI swap, a user of that network can vote on every proposal if they wanted. However, this would take up a lot of time and not everyone on UNI swap wants to devote that much of their time in order to be a part of it. Therefore, they "opt in" to delegate their vote to a node that aligns with them. This form of delegation requires a much radical form of transparency to be present.

In the case of a corporation or government, rules can be developed, passed, and approved without the cooperation of all participants in the system (Cologonse, 2007). The awareness of

both the who, what, where, and why around policy or a proposal to amend a given policy on a blockchain is much more "liquid." Everyone in the system is knowledgeable of the systems "Being." This is because the system is more transparent in its function which aligns closely to the well-established ideology of "open source" technology. Operating Systems such as Linux and browsers like Firefox and TOR require individuals to maintain and amend the automated processes that keep the system functioning.

A blockchain network is characterized by three factors, individuals, a computer, and a token. The computers on a blockchain are not AI. Most web services currently use a strong computer like an AI and supplement that with a small group of individuals tasked with maintaining the computer's function. In addition, the computer's function is kept to this circle of individuals and any authority they must be accountable to. In the case of Youtube, how content is moderated on that platform is black boxed and the moderator team share little if nothing at all to how content policing functions on the platform (Nerdcity, 2017). For a blockchain system, this relationship between individuals in the system and the computer is inverted. For one, the computer is fair less complex and is built to automate processes for efficiency rather than be judge, jury, and executionary for how the system should be functioning. Instead of only a small group of individuals possessing the knowledge of how this computer functions, every individual in the system is privy to that knowledge and can, in the case of UNI swap, take recourse when the computer is no longer functioning in a way they align with. An individual does this by using their tokens as well as influencing others to put their tokens toward initiatives that adjust computational functions.

A liquid or open democracy is a lot more inefficient. Consensus is slow since so many individuals have to approve change and SMART contract rigidity only amplifies this point as

failing DAO's have shown. However, this style of democracy is far more participatory and does away with the need for narrative forms of disclosure such as gossip or conspiracy (Birchall, 2013). While gossip and conspiracy speak to a truth about the human condition, this truth aids little in policy making, and only contributes to diluting legitimacy with narrow truths that only slow the mechanism of governance.

New World: The Sacrifice

The potential that a decentralized system offers is the ability to see and put into effect a perspective that would, in a more centralized system, never have the possibility of being seen. A system that attempts to accommodate differing perspectives is plagued with inefficiency. However, through computational processes, decisions can be made in a decentralized system more efficiently than any time before modern day computers. This is when issues in the blockchain scalability become apparent and the reality that the governance of these systems is far more rigid than proponents of blockchain technology would like to admit.

In addition to the over optimistic perception of blockchain evangelists there is a more fundamental issue of accessibility of blockchain; both in apprehension and accessibility. An example is a person that owns a Chromebook or an iPad. There is limits as to how they can contribute to a blockchain system since the devices that have access to this system lack the fundamental computational power. In turn a bias is developed and the narrative of how that person apprehends the idea of blockchain is limited in scope. A similar bias arises in developing new technology, especially computational tools, in a vacuum. This phenomenon is known as algorithmic bias which posits that developers of computational hardware and software insert their own biases into the design (Steele, 2022). Without the transparency of more "generative" or

"open-source" ideology this phenomenon goes unchecked until "the Other" comes into contact with the bias of the developer.

Ruha Benjamin, a Black cultural scholar, calls for a similar degree of transparency. Stating that only in including Black perspectives in the ontology of an application can it be truly benevolent (Frazier, 2021). The benevolence of technology comes down to accessibility and function. If the technology is transparent in use, then "the Other" has the ability to call for amendments to the technology. This level of transparency is something that blockchain enthusiasts claim is fundamental in blockchain's function but they fail to acknowledge the core principle of blockchain's immutability. Immutability is a double-edged sword. While it advocates for authenticity and reliability an error, once made, is hard to fix if not impossible (Kouhizadeh Saberi Sarkis, 2021). Having technologies' function be transparent leads to a more "open-source" and more fluid governance. However, the functions of that technology cannot be changed so the full potential of the democracy encouraged by this space is inaccessible. One needs both knowledge of blockchain and how to create applications using blockchain in order to access the totality of the systems democracy.

Barriers categories definitions.

Organizational Barriers	Organizational barriers are internal to the organizational boundaries, such as financial constraints, lack of management commitment and support, lack of new organizational policies for using technology, and lack of knowledge and expertise.
Supply Chain Inter-Organizational Barriers	This category mainly includes supply chain partners' relationship barriers. Lack of customers' awareness and tendency about sustainability and blockchain technology, problems in collaboration, communication and coordination in the supply chain, and challenge of information disclosure policy between partners in the supply chain are some examples.
Technological Barriers	This category incorporates technical issues of blockchain technology that impede its application for business purposes, such as security challenge, access to technology, and immaturity of blockchain technology.
External Barriers	External barriers are challenges stemming from governments, industries, institutions, communities, and NGOs, such as lack of governmental policies, market competition and uncertainty, and lack of external stakeholders' involvement.

Figure 9: Barriers that organizations have to adapting blockchain technology (Kouhizadeh Saberi Sarkis, 2021).

Figure 8 is from a study conducted on barriers to blockchain integration into supply chains. Proponents of blockchain see it as a way to, like the muck rakers of the early American Industrial Revolution, to keep companies accountable for mistakes or misuse. This is because all blockchain technology contains a public ledger, meaning all actions done to supply a product can be checked by regulators and average users. Adding blocks to a blockchain also provides the ability for a product to be scrutinized since the integrity of the whole chain must be kept intact with every additional block added. This enforces accountability to the total supply chain and if one part failed to meet the standards that are agreed upon by the whole supply chain then it would clear where the error was on the chain and who caused the error. What advocates of blockchain fail to be consider are, as detailed above, the rather insurmountable barriers to integrating this technology.

The supply chain crisis has been caused by supply chains reliance on dated technology and the reluctance to integrate new technology. The COVID-19 pandemic has only exacerbated the already glaring issues in commerce supply chains, from distribution, to communications between departments in a products supply chain. According to Figure 8, there are four categories of barriers; organizational, inter-organizational, technological, and external. The most looming be technological due to the immaturity of blockchain technology (Konuhizadeh Saberi Sarkis, 2021)**.** However, even if an organization attempts to develop blockchain doesn't mean others well. In order for the blockchain to function as it should, the whole supply chain must adapt to the same blockchain. This forces corporations to operate more democratically as well as transparently. This perspective is dramatically different from current Western perspectives around ownership with trade secrets and proprietary information being an essential part of how a company generates revenue. Blockchain's refusal to acknowledge how copyright is interpreted in

the context of the US and the EU has made the technology in terms of inter-organizational relationships. This relates to scalability and the issues of scaling a blockchain outside of a singular organization.

Issues in scalability also become apparent in not just technicalities but in how governance became consolidated, with power distribution never leaving he hands of the developers of blockchain. This is known as Vili's Paradox which states that blockchain, in its immutability, doesn't relinquish governance to the people that interact with the system (Mcfarland, 2021). Therefore, governance effectiveness is in the hands of only the developers, which creates a central authority and is the very sort of authority blockchain is trying to escape. The ontology of blockchain technology stems from the cypher punks who wanted to develop a financial system that upheld autonomy and privacy. They wanted to confront the issues of Web 2.0 and big tech with a new way of understanding how computers interact with humans and each other. Existentialism has similar aims and is a philosophy generated from humans trying to understand their relationship to modernity. To a world that increasingly revolves around technology in everyday life and how that'll affect the world's functions. Blockchain is a similar tool. It isn't a new concept, but it is a concept that was developed in its current form exclusively in the cyberspace of Web3.

New world: Blockchain and Existentialism

A decentralized structure of exchanging ideas qualifies every communication to the precedent. Not only does a decentralized structure acknowledge the history of the idea in its totality but also the current perception of this ideology. This perception is not informed by a collectivist or specialized perspective but by every individual who has interacted with the idea. "Being" overlaps and using a powerful technology such as a computer can render this complex

array of thought into decision in a timely manner. Currently, the issue with blockchain technology is rigidity. While democracy encourages more malleable culturally relative frameworks, blockchain posits a similar space which is true in concept but less so in practice.

Governance in a decentralized system is supposed to be distributed to who devotes the most time and effort to the system. The reality though is governance rarely shifts out of the developers and initial investors hands (Mcfarland, 2021). This phenomenon occurs because the developers lack of understanding of "the Other." "The Other" is not a computer engineer. "The Other" does not spend all day thinking about how blockchain functions. One doesn't know "the Other's" motive to be a part of something until this manifests in reality through time and interacting with the space. However, time and interaction still don't draw a positive correlation to a more robust governance. The factor that determines this relationship is the individual's literacy in the technology. For example, the modern-day work force requires a high level of technological, especially computational, competency. However, this education is not supported at a state or federal level, with legislation rarely acknowledging the need for technological literacy and education (Cole Denton Young, 2002). The computer permeates into all aspects of existence from academic, to career, to even social life. Literacy standards look different depending on the context which is an obstacle for cultivating a mutual understanding of what computational literacy is. Being literate doesn't mean one has to be an expert however, one has had to interact with the technology and have some historical context of the cannon in which the concept is building on (Cole Denton Young, 2002). Literacy is a crossroad between expertise and the Other in acknowledging that technical expertise doesn't imply a strong understanding of a concepts, ethics, social, or political implications.

The existential burden of industrialization, as forecasted through existentialism themes such as anxiety induced psychosis (Deleuze & Guetarri, 1972) and the absurd, observed in transcendent moments of reality (Sartre, 1943) where the tension in the divorce of person and life exists. Time and space have evolved with the post modernization of thought, as predicted by existentialism. Nuance is everything and utilitarian and deontological frameworks leave out too much truth. In their attempt to define a domineering opinion, a universal ideal, they've abandoned what time and "the Other" will do to this ideal. The ideal would be tested in ways the creators and initial believers of the ideal would never conceive. An individual could never test an ideal to its furthest extent unless they were both fully transparent and the ideal had been understood by people who are nothing like the people who conceived the ideal. Blockchain, at its most basic, has had this analysis be a fundamental component of its function. A truly decentralized system is this phenomenon of proposal and approval done transparently through a network of individual stakeholders.

Efficiency looms over principle, especially in a capitalist society (Zamangi, 1993). Open democracy only further slows decision making. The necessity to accommodate all perspectives in a decentralized network is a cornerstone rather than an aspiration. Never in history has there been a complex enough machine to aid democratic processes until the modern computer. Computers coupled with blockchain technology have the potential to maintain the freedom and autonomy of the internet. In addition, computers, with the help of individuals, can mitigate "bad" information and rather than a central authority retaining full control of decision-making. Individuals who operate in the system will get to have a say in what the system deems as "bad."

Conclusion

In history, societies answer to inefficient bureaucracy has been solved through delegation. In democracy, more delegatory power is vested in every member of the society. Giving power to more individuals makes decision making a lot more complex because power is evenly distributed. While involving more individuals in a decision will determine an outcome that is truer since the decision is informed by differing perspectives that inhabit the world. There is sometimes not enough time for this process to occur. This is why delegation exists. In a decision there is always expert perspectives that typically carry a greater weight in the outcome. In the case of a more centralized governance power is consolidated to a small group within the state. This group holds significantly more political power than any other group in the society and have an impact if not direct effect on the outcome of every decision made in the society.

While a democracy with a strong central authority is significantly more efficient in decision making there is a lack if not outright denial of other's truth. The outcome is therefore narrow in its scope because fewer perspectives are considered in the decision. To balance power, democratic societies use utilitarian thought to judge the morality of the decision based off a simple majority. An outcome that is closest to achieving a categorial imperative, a universal principle, is considered to be the best decision morally and net the most positive outcomes for the most people. Striving for this "universal principle" is where the philosophy of deontology furthers utilitarian thought. Deontology utilizes relativism allowing for context and the individual to influence a decision, not just a simple majority. Democratic governance brings these perspectives together in the hopes of creating policy that is informed by a wide breadth of individuals and attempts to create a universal norm. An example of this is the Bill of Rights, particularly the amendments contained within this document such as the first amendment which

grants every US citizen with the freedom of speech. Ethical pluralism seems to solve the downsides of utilitarianism lack of relativity to morality and deontology's over reliance of culturally relative norms. However, there is still a minority or an unaccounted-for person. In existentialism this phenomenon is called "the Other."

"The Other" is a "Being" that exists outside of one's experience. This "Being" cannot be understood as one can with themselves. Even if "the Other" was fully transparent with another "Being", their "Being" cannot be understood and experienced in totality. A conscious "Being" projects what they want into the world. In addition, as they interact with the world, others contribute to defining that "Being", these "Beings", as Sartre refers to them are "Being-for-itself." When these "Beings" interact with reality their "Being" becomes "Being-in-the-world". The deepest level of "Being" is the object or a "Being" that cannot be altered consciously. This is "Being-in-itself": a "Being" that either lacks or has no conscious influence (e.g. objects such as chairs, tables, a bureau). These are labels that are mutually agreed upon by conscious "Being's" however these objects exist outside of our conscious. The subconscious exists in a similar state and cannot be apprehended or directly influenced by a conscious "Being."

There will always be a "Being" that exists outside of one's perception. In striving to create a universal truth or defining morality through a simple majority this "Being" is left out in the hopes that a high level of democracy can be achieved in a reasonable amount of time. Modern computers can be a tool to make a space that is the most openly democratic and can be executed in a timely fashion. Big tech evolves too fast for more traditional forms of governance to keep up. Using blockchain technology, the users that utilize big tech applications in their day to day lives can dictate how they function. In order to create a new block on the chain, everyone in the system must confirm the blocks legitimacy. So instead of claiming the systems in which

information is mitigated as proprietary, tech companies will have to be radically open since their systems axiom is built off an open democratic model rather than a traditional model of governance. Delegation can still be available in this context however rather than opting into delegating power that is built off the amount of time and effort one puts into the given digital space a user would opt out making a deliberate decision of where they're going to delegate whatever governance they've acquired in their time in the digital space.

Reference

Barlow, J. P. (1996, February 8). *A declaration of the independence of Cyberspace*. Electronic Frontier Foundation. Retrieved from https://www.eff.org/cyberspace-independence

Barba, R & Kondova, G. (2019). Governance of Decentralized Autonomous Organizations. *Journal of Modern Accounting and Auditing*, *15*(8), 406–410. https://doi.org/10.17265/1548-6583/2019.08.003

Bartlett, J. (2018). *The dark net*. WF Howes Ltd.

Birchall, C. (2013). Radical Transparency. *Cultural Studies Critical Methodologies*, 1–27.

Brock, K. (2019). *Rhetorical code studies: Discovering arguments in and around code.* University of Michigan Press: DigitalCultureBooks, 115–147. https://doi.org/https://www.jstor.org/stable/j.ctvndv9pc.11

Buterin, V. (n.d.). *Ethereum whitepaper*. ethereum.org. Retrieved from https://ethereum.org/en/whitepaper/

Chandler, S. (2022, November 21). *Proof of stake vs. proof of work: Key differences between these methods of verifying cryptocurrency transactions*. Business Insider. Retrieved from https://www.businessinsider.com/personal-finance/proof-of-stake-vs-proof-of-work

Chepkemoi, J. (2017, April 25). *The 25 largest internet companies in the world*. WorldAtlas. Retrieved from https://www.worldatlas.com/articles/the-25-largest-internet-companies-in-the-world.html

Coglianese, C. (2007). Legitimacy and Corporate Governance. *Delaware Journal of Corporate Law*, 32(1), 159-168.

Cole, J. R., & Denton, D. Young, A. T., (2002). Improving Technological Literacy. *Issues in Science and Technology*, *18*, 73–79.

Dias, E. (2018, April 11). *Trump Signs Bill Amid Momentum to Crack Down on Trafficking*. The New York Times. https://www.nytimes.com/2018/04/11/us/backpage-sex-trafficking.html?&moduleDetail=section-news-3&action=click&contentCollection=Politics%C2%AEion=Footer&module=MoreInSection&version=WhatsNext&contentID=WhatsNext&pgtype=article

Deleuze, G., Guattari Félix, (1972). *Anti-oedipus: Capitalism and schizophrenia*. Penguin.

Ehrenkranz, M. (2016, May 20). *Want to watch porn? The UK Government says you need a credit card*. Mic. From https://www.mic.com/articles/143901/want-to-watch-porn-the-uk-government-says-you-need-a-credit-card

Eoyang, M., & Garcia, M. (2020). Weakened Encryption: The Threat to America's National Security. *Third Way*, 21pgs. JSTOR. https://www.jstor.org/stable/resrep26171

Frazier, N. (2021, September 24). *Black blockchain: The Future of Black Studies and Blockchain*. Dialogues. Retrieved from https://amsj.blog/2021/08/19/black-blockchain-the-future-of-black-studies-and-blockchain/

What is Stakeholder Theory? (2009). *YouTube*. Retrieved from https://youtu.be/bIRUaLcvPe8.

Haan, S. C. (2019, October 21). *Facebook wants to change the meaning of "authenticity" to benefit itself. Slate Magazine*. Retrieved from https://slate.com/technology/2019/10/mark-zuckerberg-facebook-georgetown-speech-authentic.html

History of the Mozilla project. Mozilla. (n.d.). https://www.mozilla.org/en-US/about/history/

IBM. (n.d.). *IBM System 360*. IBM. Retrieved from https://www.ibm.com/ibm/history/ibm100/images/icp/M044580T10744F93/us__en_us__ibm100__system_360__men_at_s_360__800x635.jpg

IBM. *IBM100 - System 360*. (n.d.). Retrieved from https://www.ibm.com/ibm/history/ibm100/us/en/icons/system360/

Jones, L. (2018, March 12). 'society shrouds birth in shame': *Challenging Instagram's ban on women in Labour*. The Guardian. Retrieved from https://www.theguardian.com/lifeandstyle/2018/mar/12/childbirth-images-instagram-ban-censorship-katie-vigos-labour

Kaufman, W. (1956). *Existentialism: From Dostoevksy to Sartre*. Plume.

Kouhizadeh, M., Saberi, S., & Sarkis, J. (2021). Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers. *International Journal of Production Economics*, *231*. https://doi.org/10.1016/j.ijpe.2020.107831

Landemore, H. (2020). The principles of Open democracy. *Princeton University Press*, 128–151. https://doi.org/10.23943/princeton/9780691181998.003.0006

Martineau, P. (2018, December 4). *Tumblr's Porn Ban Reveals Who Controls What We See Online*. Wired. https://www.wired.com/story/tumblrs-porn-ban-reveals-controls-we-see-online/

McFarland, E. (2021). *Blockchain wars: The future of big tech monopolies and the Blockchain internet*. Evan McFarland.

Nerdcity. (2017). *Youtube's Secret Codes Revealed*. *YouTube*. From https://www.youtube.com/watch?v=_4NgO69RprE&t=8s.

Newman, L. (2020, March 5). *The EARN IT Act Is a Sneak Attack on Encryption*. Wired. https://www.wired.com/story/earn-it-act-sneak-attack-on-encryption/

Park, W. G. (n.d.) (2010). THE COPYRIGHT DILEMMA: COPYRIGHT SYSTEMS, INNOVATION AND ECONOMIC DEVELOPMENT. *Journal of International Affairs Editorial Board*, 64(1), 55–68. https://doi.org/https://www.jstor.org/stable/24385185

Paton, E., & Ramzy, A. (2020, July 23). *Coalition brings pressure to end forced Uighur Labor. The New York Times*. Retrieved June 1, 2022, from https://www.nytimes.com/2020/07/23/fashion/uighur-forced-labor-cotton-fashion.html

Pfau, B. N., & Cohen, S. A. (2003). Aligning Human Capital Practices and employee behavior with shareholder value. *Consulting Psychology Journal: Practice and Research, 55(3)*, 169–178. https://doi.org/10.1037/1061-4087.55.3.169

Popper, N. (2016, June 17). *A hacking of more than $50 million dashes hopes in the world of virtual currency*. The New York Times. Retrieved October 6, 2022, from https://www.nytimes.com/2016/06/18/business/dealbook/hacker-may-have-removed-more-than-50-million-from-experimental-cybercurrency-project.html

Rosenzweig, R. (1998). Wizards, bureaucrats, Warriors, and hackers: Writing the history of the internet. *The American Historical Review*, 103(5), 1530–1552. https://doi.org/10.1086/ahr/103.5.1530

Ryan, R., & Donohue, M. (2017). Securities on Blockchain. *The Business Lawyer*, *73*(1), 85–105. JSTOR.)

Sanderson, G. (2017, July 7). *But how does bitcoin actually work?* YouTube. Retrieved from https://www.youtube.com/watch?v=bBC-nXj3Ng4

Sartre, J.-P. (1943). *Being and nothingness*. Washington Square Press.

Shah, H. (2020, March 11). *From 0 to 70% market share: How google chrome ate the internet*. Nira. Retrieved from https://nira.com/chrome-history/

(2022, January 14). *Global: E-commerce revenue by country 2022*. Statista. https://www.statista.com/forecasts/1283912/global-revenue-of-the-e-commerce-market-country

Steele, C. (2022, April). *Digital Black Feminism*.

Stelzig, T. (1998). Deontology, governmental action, and the distributive exemption: How the trolley problem shapes the relationship between rights and policy. *University of Pennsylvania Law Review, 146(3)*, 901–959. https://doi.org/10.2307/3312613

UK: Europe's top court rules UK mass surveillance regime violated human rights. Amnesty International. (2022, January 7). From https://www.amnesty.org/en/latest/news/2021/05/uk-surveillance-gchq-ecthr-ruling

UNISWAP governance. Uniswap Governance. (n.d.). From https://gov.uniswap.org/

Warren, T. (2018, September 2). *Google's chrome browser is now 10 years old*. The Verge. Retrieved from https://www.theverge.com/2018/9/2/17811844/google-chrome-browser-10-years-history

Williams, D. (2022, March 31). *A technical overview of the internet computer*. Medium. Retrieved October 6, 2022, from https://medium.com/dfinity/a-technical-overview-of-the-internet-computer-f57c62abc20f

Young, S. D. (2022, May 18). *Will a proof-of-stake Ethereum lead to more centralization?* CoinDesk Latest Headlines RSS. Retrieved from https://www.coindesk.com/layer2/2022/05/18/will-a-proof-of-stake-ethereum-lead-to-more-centralization/

YouTube. (2022). *Yukio 'my wife is asian' Mishima, Confessions of a Mask - The Book Club Reupload*. *YouTube*. Retrieved October 5, 2022, from https://www.youtube.com/watch?v=5SUJ46mYOHo&t=232s.

Zamagni, S. (1993). EFFICIENCY, JUSTICE, FREEDOM: A PERSPECTIVE FROM MODERN ECONOMIC THEORY. *Giornale Degli Economisti e Annali Di Economia*, *52*, 455–477.

Zittrain, John/UChannel. (2008). *YouTube/The Future of the Internet and How to Stop It*. Retrieved May 31, 2022, from https://www.youtube.com/watch?v=NEsmw7jpODc&t=367s.