Governance structure in Metaverse - single unit or multiple

units?

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The paper critically analyzes the usage of Metaverse in the post-Covid market and thus presents a definition of Metaverse. With the advanced description of the Metaverse, the paper arrives at an ethical theory that argues how the Metaverse should have multiple bodies of governance. To develop the theory, I used the groundwork of a previous study on the ethics of governance and based my theory on the key aspect of Ethical Governance - trust, inclusivity, diversity, and equality. The major result of the paper is the claim that Metaverse should be governed by multiple structures and bodies. With companies like Facebook investing \$70 Billion USD into the industry, while at the same time the Metaverse is expected to be worth \$824.52 Billion USD by 2030, it is important that we have structured governance for the upcoming(Verified Market Research, July 13, 2022). Therefore, it is expected that the theory presented in the paper will escalate the debate in terms of the ethical governance of Metaverse - which has been in dialogue since over a decade.

Keywords: Metaverse, Ethical Governance, Blockchain, Equality

Introduction

In the following paper, I will be addressing the main question on the ethics of governance in Metaverse. More specifically, should a single governing body regulate the entity of Metaverse? I will be using "Life, the Metaverse and Everything: An overview of Privacy, Ethics, and Governance in Metaverse" by Carlos Bermejo Fernandez and Pan Hui as my main source. In brief, the paper lays down an ethical foundation about the three major dimensions of Metaverse - Privacy, Ethics, and Governance. Similarly, the paper provides insight into different technologies associated with the governance of Metaverse -Blockchain and Decentralized Autonomous Organization(DAO)-upon which I'll base my theory(Fernandez and Hui, 2022: 1 and 5). While Fernandez and Hui show how the foregoing technologies relate to the governance in Metaverse, I take a step forward with it and argue on the structure of governance for which the technologies Fernandez and Hui mentioned make sound and ethical sense.

Additionally, while the paper by Hui and Fernandez does an excellent job addressing a diverse array of topics, I claim that the paper fails to address the interrelation between the different pillars of governance. In short, while the paper explains governance and ethics as a unit, they fail to address them together from a unison perspective. Hence, I will be writing about the interrelation between the Governance and Ethics of Metaverse and thereby propose my thesis. Finally, addressing the intensity of the debate on the governance of the Metaverse, I propose my thesis that Metaverse should be Governed by multiple bodies of government.

The three pillars of ethical governance:

The main source of my thesis is the paper *Life, the Metaverse and Everything: An overview of Privacy, Ethics, and governance in Metaverse* written by Carlos Bermejo Fernandez and Pan Hui(Fernandez and Hui, 2022: 1). The previously mentioned paper's main question is to constitute a modular and ethical framework under which we can design and implement Metaverse. To answer the question, the writer presents his main thesis which follows as "three major pillars guide development of the metaverse: privacy, governance, and ethical design, to guide the development of the metaverse." (Fernandez & Hui, 2022: 1). The authors have divided his argument into three ethical pillars in order to guide the development of the metaverse. To further strengthen his argument and propose an ethical framework to implement Metaverse, the author subdivides further. Finally, the author proposes his main thesis that Metaverse must address Modular Design which includes Human Rights and Human Effort. In addition, Metaverse must also consider the social aspects of humanity like Equality, Trust, Diversity, Accessibility, etc.

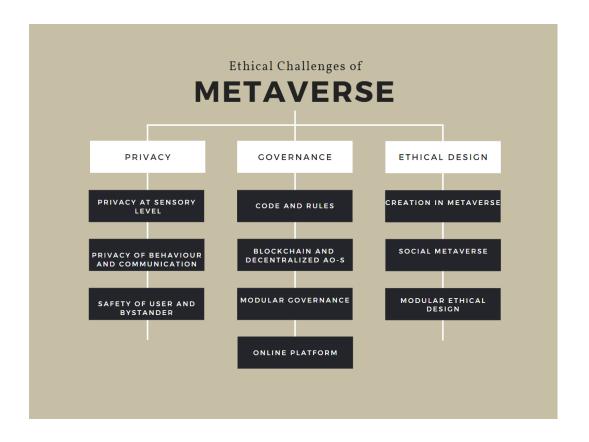


Figure 1.1: The above figure shows how the author divides the argument for the challenges of the metaverse.

To that effect, the author subdivides Privacy into Privacy at the Sensory Level, Privacy of Behavior and Communication, and Safety of User bystanders.

To build his first argument he goes into the major reason for the inclusion of privacy violations in Metaverse, i.e. that different technologies and advancements might encroach on people's private space and thereby violate specific human rights through different aspects. The assumption above is backed up by three strong arguments. Privacy at the sensory level includes devices such as extended reality(ER) that extract the personal information of human life on a day-to-day basis. Secondly, the privacy of behavior and communication mostly exploits the communicative behavior between people and associated data that pose a threat. Finally, the safety of the user and bystander

exposes a risk to the third-party observers- be it the pedestrian on the street when close to an auto-driving car or a worker in an automated factory whose life might be at risk by an untrusted machine.

As his second argument, the author extends his reasoning to the governance of Metaverse. Lack of rules and regulations about modern technology is a prime facie case in the legal world of technology and to this end, the author proposes four sub-divisions of governance to argue the lack of proper governance will be a challenge to the implementation of Metaverse. The four classes include Code and Rules, Blockchain and decentralized Autonomous Organizations, Modular Governance and Online Platforms.

Decidedly, the reason to include Code and Rule is simply to strengthen his claim that software developers mostly have the right to set a code and rule which can be easily misutilised. To the same end, the blockchain and decentralized autonomous organization are used to argue that the metaverse will require a highly powerful data storage and blockchain system which hence can't be scalable with the resources available to us today. Additionally, the modular governance provides a solid claim on the lack of a broad spectrum of processes and juries- including proper debate and legal research in regards to the implementation of Metaverse which as a result poses a threat of confusion to the defendant. Finally, the author uses the fact that online platforms and e-commerce sites should deal with user misconduct; meanwhile, it's not the ideal scenario for private companies to deal with public misconduct.

Finally, the paper's third argument binds both the earlier mentioned challenges and sets up a solid foundation of the ethical framework needed to establish Metaverse. For an expanded, annotation view of this idea, see figure (1.1). The author divides the ethical design into

subcategories - the creation of Metaverse, Social Metaverse, and Modular ethical design. Each of these above divisions reflects back to privacy and governance, where he mentioned how metaverse violates user privacy and that the technology lacks proper governance and thus provides an ethical stance on it. The author ends with a note that it is crucial to address accessibility, diversity, equality, humanity, and trust to guarantee an ethical system. Furthermore, it refers to the governance and expounds several ideas like how Human Rights might be violated in case of the lack of inclusiveness, diversity, and accessibility to further stress his argument on ethical governance. In a nutshell, the author does so to show a preliminary step towards an ethical design for Metaverse. The author points back to privacy by exploring several technologies like Blockchain, Decentralized Autonomous Organizations, and Non-Fungible Tokens(NFTs).

Even though further research and exploration of these technologies would be ideal, the paper does a solid job to identify the challenges and thereby propose an ethical framework. However, the paper fails in certain aspects, for instance, to address the adequacy of certain topics like Blockchain and Decentralized Autonomous Organizations, which I will consider in the following section.

Is the three-pillar argument sound?

As mentioned earlier, the main argument of the paper is based on the three pillars of a Metaverse and thus uses them to design an ethical framework to guide the development of a Metaverse. Furthermore, the author builds up the main claim by addressing significant challenges that the metaverse will face in terms of security and privacy, ethics, and governance. To support the main claim, the paper also includes several trends and approaches used in the current online world

that might pave the path for research solutions to a sustainable metaverse. With the overall goal to brainstorm the ethical framework of the metaverse, the writer proposes a few solutions to the mentioned challenges. First, I claim some of the solutions proposed in the paper contradict each other, while the other solutions do not address the complete picture necessary to reach a conclusion. Furthermore, I argue that the writer explains concepts such as Blockchain which I believe lacks detailed explanation given its high importance and relevance to Metaverse. Finally, the paper also ignores crucial aspects and features of Blockchain that make the system highly regarded in the space of Metaverse. Therefore, in this and the following sections, I will argue against the aforementioned claims.

To begin, I claim the author's solution about how the metaverse might pose a privacy threat at the sensory level doesn't address the complete picture. Briefly, privacy at the sensory level, according to Fernandez and Hui, is the risk associated with different technologies which unethically collect data from the user that are otherwise considered sensible and private information. While the author identifies the gap and suggests further research and development of frameworks that control the privacy of data securing the input channel of the device, I strongly believe that the output channel should also be examined more specifically to advance privacy at a sensory level. I claim that output channels include how the data collected will be represented. An example of it might be how AI-powered cars react to a traffic jam based on the driver's past record. While the author explains how input devices like sensors and cameras must be further well designed to prevent private information from getting into the system, he fails to comprise how that information will be processed and hence implied in the real world. "A growing body of literature focuses on mitigating privacy risks that stem from applications' needs to gather input from the numerous sensors on AR devices, such as cameras. In this work, we focus instead on a complimentary issue: the security risks of AR output,

or the risks that arise from AR applications' abilities to modify a user's view of the world." (Lebeck, 2017: 2). Since the author only discusses the problem of the input channel, I argue the frameworks proposed by Kiran Lebeck in the aforementioned paper would complement the full picture in the scenario(Yang et al., 2022: 1).

Secondly, while the author firmly establishes the need to address the problem of safety and bystanders, I assert a criticism since the solution he recommends to the problem contradicts different parts of the paper. More specifically, the author claims that additional sensors must be added to devices which has a threat of collision and accident for the safety of bystanders and pedestrians. In simple words, he means that AI-powered cars and trucks must have more security cameras and modern devices/technologies which compliments the increased safety of the public(Fernandez & Hui, 2022: 2). However, the authors previously claim that increasing the number of input devices-be it sensors and cameras poses a threat to the collection of sensible and private information. I have a strong sense that the proposed solution isn't valid and sound- thus, an alternative must be thought of. While the author does mention that the increased input devices must not incur the collection of more sensible data, I'd like to advance this view by proposing an ethical choice to look at the algorithm of the machine and the output channels. This includes how the AI system in the car is designed to interact with the data and thereby if the output channels are ethically representative of all the inclusive potential cases of action that might occur.

Finally, the author has placed the central theme of the argument on the Governance of Metaverse over Blockchain and Decentralized Autonomous Organizations (DAO). However, I have strong skepticism about the idea of introducing Blockchain and DAO with minimal clarification and explanation on the topic. Since the two technologies are the backbone of Metaverse, I claim that the paper lacks enough explanation of those concepts. Hence, in the upcoming sections, I will be

explaining the idea of Blockchain and Decentralized Organization in detail as a part of my thesis. Additionally, the author expands on to mention "..we can foresee that the described tools and approaches could shape the metaverse and accommodate the necessary regulations accordingly." (Fernandez & Hui, 2022: 4); however, he has no supporting stance for the claim. Therefore, I will be presenting my central argument of the paper to claim why necessary regulations should be accommodated accordingly for Metaverse. In fact, I will propose a distinct regulation that should be accommodated for Metaverse.

Theory of multiple-body governance in

<u> Metaverse:</u>

In the following sections, I will introduce the concept of Blockchain and Decentralized Autonomous Organization. Since the metaverse heavily relies on those two concepts, it is crucial to have prior knowledge of how they work. Following this, I will define Metaverse with a few examples. With this, I will have a solid foundation to introduce my main argument on the governance of Metaverse- which will re-appear in the later sections of the thesis. Finally, I will address the ethical concern of the governance of the Metaverse I proposed through the ethical lens of Aristotle and Philosopher John Rawl.

3.1 Terminologies:

3.1.1 Blockchain:

Blockchain, also called a distributed ledger, is the collection of blocks of data linked to each other by the identification of previous blocks of data- technically, it is referred to as Hash Value. Apart from the hash value, the Blockchain system also uses timestamp, nonce, and transaction data contained in the block for added security(Jake Frankelfield, 2022). Time-stamp is valid only when the time of the transaction of the block is greater than the network-adjusted time plus two hours and greater than the median timestamp of the prior eleven blocks. It is essential to note this because the median of the timestamp of the previous eleven blocks allows the Blockchain to smoothly operate based on the common consensus protocol of several different preceding nodes; rather than some governing body. This concept is called Peer-to-peer communication(Toshendra Kumar Sharma, 2022).

The Internet that we use today is mostly based on the concept of stand-alone computer or client-server architecture, where a giant server handles all the information about the client and hence processes it upon request. It can be visualized as a data monarchy since the server or the royal family handles all the data and information about the clients or the citizens. However, since Metaverse contains a vast amount of data points -from the personalized level to the sub-conscious level of human behavior- it is impossible to design a system with Client-Server architecture. Hence, the blockchain system relies upon a decentralized peer-to-peer architecture, which serves as a part and parcel of the Metaverse system. The following system can be visualized as a data democracy where the people's representative collectively form a government who store the data of the people(Shermin Voshmgir, 2019: 2.44).

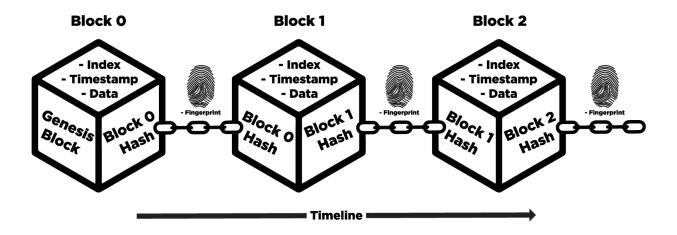


Figure 1.2: Provides a holistic view of Blockchain and how every block contains an index, time stamp,

and data

Finally, blockchain plays two important roles inside the metaverse. First, it provides the privilege to store data from anywhere on the metaverse. Since it is a peer-to-peer network, otherwise "a democratic network", users can freely store their information on it and retract that information back easily at any time with guaranteed security(Oodles Blockchain, 2022). Second, since blockchain is decentralized and accessible to everyone who decides to use it, users are guaranteed a secure digital market. Digital currencies such as Bitcoin and Ethereum and digital

tokens such as NFT have successfully been seen as a medium for digital transactions, all of which use the Blockchain system.

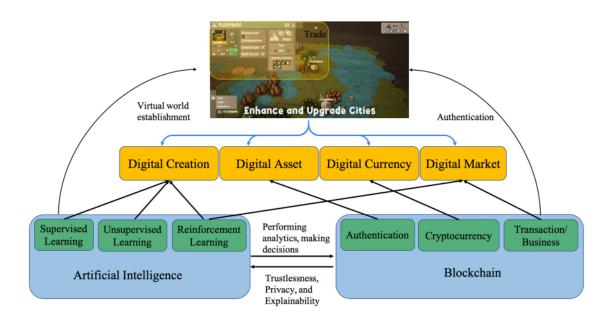


Figure 1.3: Visually depicts the two aforementioned uses of Blockchain in Metaverse(Yang et al., 2022:

3.1.2 Decentralized Autonomous Organization(DAO)

A Decentralized Autonomous Organization or DAO is a community-led authority bound together by the use of a Smart Contract (IBM, 2021). A set of rules and community standards is governed by the user-voting where people create proposals and thereby come together to vote for each proposal. DAO has been supporting a lot of movements including Black Lives Matter. It brings a group of supporters together and provides them with the space to raise their voices, cast votes, and propose new proposals. Black Lives Matter has a \$PEACE token which is a digital asset for people to buy, and hence, the money raised will be governed by the collective vote of the people. Since the voting is completely transparent, every voice is heard in this organization (BlackLivesDAO, 2022).

Something to be aware of DAO is how it is affecting regular life at this point. It started in 2015 to facilitate crowd-funding sources and since then it began taking over the world of crypto-currency.

However, today it is entering into the daily choir of human life- whether it be protest or venture capital and investment firms. In short, DAO is entering the "non-crypto" world by serving the interest of the common good rather than the crypto-users themselves.

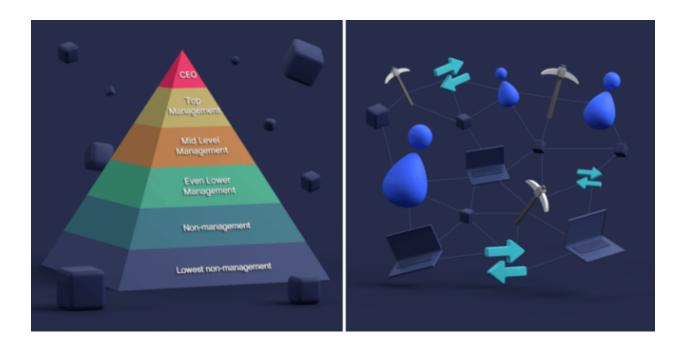


Figure: Left image is a traditional governing structure whereas the right is the DAO structure(Ernesto

Frontera, 2021).

3.2 Where is the Metaverse today? In fact, what is Metaverse?

The term metaverse originated in 1992; however, the actual publicity around the concept and technology didn't emerge until the spread of the COVID-19 virus in 2020. Since the virus restricted people's interaction and bound everyone to their homes, people found it easier to meet new people and interact in the virtual universe. Moreover, Metaverse also opened new ways to make money online, store cash virtually, run businesses, and continue work with relative ease(Danial Ibrahim, 2022). It opened ways that couldn't be thought of otherwise. To further define Metaverse, I'd like to list the following few examples.

Example 1: In 2020, singer Travis Scott performed live in Fortnite, an online game, and reportedly earned roughly \$20M USD(Puah Ziwei, 2020). While all his prior shows, including the famous Astroworld tour, made just around \$1M USD per show; a virtual concert took a big leap in terms of his profit. Furthermore, there were close to a dozen people who died in the Astroworld concert, while Epic Games, the parent company of Fortnite, claimed the virtual concert remained

safe and over 12.3 million concurrent players participated in the show(Lisa Respers Frace and Sara Spary, 2020).

Example 2: Metaverse is taking over the clothing industry with people preferring to buy digital replication and collector items from famous clothing brands like Nike, Adidas, and Burberry. While Adidas has a separate section on its website called the Metaverse collection, Nike remains equally ahead in the game(Adidas, 2021). In December 2021, Nike Inc. acquired RTFKT for a total of \$1 Billion. The company takes inspiration from an array of childhood passions such as Dragon Ball Z, Akira, and Starwars and thereby uses blockchain technology to deliver next-generation collector items to the ever-growing customer base. Additionally, buyers can now purchase a digital replication and avatars of any Nike items and put them online for others to see it. The market is rapidly emerging into the Metaverse.

Example 3: The usage of virtual meetings and calls is an example of Metaverse. The total Zoom users spiked from 10M pre-pandemic to over 300M post-pandemic, while the revenue increased to over \$750M USD as shown in the graph below. This alerts us to another severe

warning of how Metaverse, blockchain technology, and Decentralized Autonomous Organizations are integrating into different businesses.



Figure: Shows the increase in the revenue of Zoom over the fiscal years in the X-axis. Shows a rapid increase post-pandemic where people preferred to hop onto virtual calls and the trend continues to date even though the pandemic has mostly been over.

3.3 Define Metaverse:

There are two key points we can gather from the above-mentioned examples:

- 1. Metaverse has a unique application in different sectors. Hence, it's not the same for everyone.
- 2. Anyone can quickly adapt their business model to the metaverse

With the two key takings from the set of examples, I re-iterate the Oxford Dictionary of Metaverse as "a virtual reality space in which users can interact with an environment generated by computer and with other users." (Oxford Dictionary, 2022). It is important to note that Metaverse is a concept, rather than a commodity, that can be applied to any business and company. We can see from the examples above how the term Metaverse can be implied differently by different institutions. While many sources including Wikipedia describe Metaverse as "... a hypothetical iteration of the Internet as a single, universal, immersive, virtual world...", I strongly object to it.

With the help of the above definition, I purpose my thesis, theory on multiple body governance, in the upcoming section.

3.4 Single-body governance or multiple-body governance?

For the following part of the paper, I will propose three premises that will introduce a conclusion to the governance of Metaverse. For the sake of clarity, single-body governance is where a single organization/body will regulate every aspect of Metaverse in a country. Multiple-body governance is where the structure of the governance is divided into multiple layers which associate with various types of companies and divisions within it. The argument is listed below:

- Premise 1: Metaverse is being implemented as a concept by different companies/users in various designs.
- Premise 2: Multiple implementations can have a single-body governance structure;
 however, I argue it will be unethical.

- Premise 3: A mixture of distributed governance and multiple governance body will be ethical.
- Conclusion: Hence, Metaverse should be governed by multiple bodies of governance to uphold ethical grounds.

Premise 1: Metaverse will be implemented as a concept by different companies/users in different fashions.

Metaverse is a rational concept that can be applied by anyone for the personal user or team/company. We can relate Metaverse with the dot-com trend where companies started making a website for themselves in the late 90s and early 2000s. From the example above, we can see that different companies have been implementing Metaverse differently. For instance, Nike has a different implementation of Metaverse compared to Fortnite.

Premise 2: Multiple implementations can have a single-body governance structure; however, I argue it will be unethical.

On one hand, some believe that it is possible to envision a robust governance structure to anticipate future needs and thus have a mixed stance in terms of the type of governance (XRToday, 2021).

On the other hand, ethicists and researchers believe the current governance framework is suitable for addressing the issue that arises(Tom Bascom, 2021).

Between the single-unit governance and multiple-unit governance in the Metaverse, I claim that the former structure of governance has an unethical implication. To clarify my argument further, I'd like to take an example of the legislature of website companies. Namely, different company structures have different codes of conduct and legislative practices - like e-Commerce sites operating under a different set of rules than Social Media companies.

If we attempt to constitute a single set of governing bodies that regulates all the different types of online companies, we'd set up ourselves in an unfair society. In particular, the rules for e-Commerce companies vary from the rules for social media companies. For instance, if we attempt to regulate Facebook the same way as Amazon, we'll end up with an unethical judgment. In the same fashion, the same regulation for different implementations of Metaverse will be unethical even though it's possible.

Premise 3: A mixture of distributed governance and multiple governance body will be ethical.

From the above argument, we see the second choice of governance is multiple-body governance. Multiple governance can also mean that Decentralized Autonomous Organizations and Blockchain solely control the Metaverse with no external governance. However, I'm not arguing for it. It is not to confuse that the multiple governances in this context are that varying implementations of Metaverse by different companies must have their own governing bodies. In particular, any legal decisions regarding Adidas Metaverse should be independent of the legal decisions for Zoom.

Conclusion: Hence, while Metaverse can have single-body governance, Metaverse should be governed by multiple bodies of governance to uphold ethical grounds.

From premise 2, we can see that Metaverse can be governed by the current governance structure or by a supreme body that decides on every law and regulation about the "technology". However, we also see why a multiple governance body is ethical from Premise 3. Therefore, it is a direct conclusion that Metaverse should be governed by a distributed and decentralized governance structure.

3.5 Is the theory of multiple-body governance ethical? :

While my argument does address the aspect of ethics in large part, I believe that the criticism against it involves a critical analysis of ethics and technology in general. In particular, I have classified the criticism of my argument into two categories.

- How different sets of rules serve the need for equality and justice. Particularly, how is
 the legal system equal if two different companies operating under the same umbrella is
 being treated differently?
- What if the Blockchain system and Decentralized Autonomous Organization(DAO) get toxic? Which governing body or in fact who will regulate the system?

In the following part, I will address both criticisms differently. For the first criticism, I will refer to two definitions of equality by philosophers John Rawl and Aristotle and hence draw a tech-ethical conclusion to describe equality. I will use two cases of single governance and classified governance in Metaverse and therefore compare and contrast them. However, for the second criticism, I'll take a rather technical standpoint and hence address the critics using my argument.

• How different sets of rules serve the need for equality and justice. Particularly, how is the legal system equal if two different companies operating under the same umbrella is being treated differently? For the following argument, I'd refer to the article "Technology and Engineering Practice: Ethical Lenses to Look Through" by the Markkula Center of Applied Ethics at Santa Clara University(Vallor, Green, Raicu, 2022: 4-6). The article was written by Shannon Vallor, Irina Raicu, and Brian Green in an attempt to draw basic ethical theories for practical ethical concerns. Furthermore, I'd like to refer to the right/fairness perspective of the ethical lens from the above-mentioned paper. The following perspective basically resolves issues referring to the equality principle of Aristotle and the justice/fairness philosophy by Philosopher John Rawls. To re-iterate Aristotle's and Rawl's principles on equality, I have listed them below.

- Aristotle: argues that equals should be treated equally; however, that leaves open the question of which criteria should be used to determine whether people are "equal"
- Rawl: argues that a fair and just society should be organized under a "veil
 of ignorance" about characteristics over which people have no control
 and which should not determine participants' roles and

opportunities in the society- characteristics such as age, gender, race, etc.

The highlighted part of the text leaves us with one open question.

→ What are the burdens and benefits of the design and how do they distribute among various stakeholders?

For our reference, let us assume two types of governance. One where Metaverse is operated under a single governance structure; while the other follows my argument and hence is operated under multiple governance structures.

Take an example where a group of hackers robs a virtual bank while at the same time another group of hackers robs a virtual candy store. Furthermore, the former steals a virtual currency of an equivalent of \$100M USD, while the latter robs a virtual currency of \$1,000. Assuming the fact that both the store is being operated under Metaverse and a single unit governance is in place, a single set of the legislature will handle both cases. Say, any robbery under the

Metaverse unit will be penalized for up to X years and a fine up to USD Y. From the above question, the burden and benefit of this system would clearly favor bank robbery.

However, if we classify the Metaverse governance and separate different business structures, both the robbery will be handled differently. This would serve equality and justice to a higher degree. Therefore, to conclude, I claim that the governance in the Metaverse should be classified which as a result promotes equality through the tech-ethical conclusion drawn from Aristotle and Rawls's philosophy.

What if the Blockchain system and Decentralized Autonomous Organization(DAO) get toxic? Which governing body/ who will regulate the system?

The above criticism was published in the World Economic Forum which argued for the long-term respect of human beings inside the Metaverse system. Specifically, as mentioned earlier, Metaverse relies primarily on Blockchain and Decentralized

Autonomous Organizations. As mentioned earlier in the second 3.1.2, a key aspect of DAO is the usage of Smart Contracts- which basically allows people to vote to rule the Metaverse. Cathy Li, World Economic Forum questioned "If a virtual environment run by a DAO becomes toxic, who is responsible?"(Cathy Li, 2022). This is an unsolved dilemma; however, I believe that my theory on multiple-body governance has an ethical solution to it.

An immediate question to Cathy's question might be, who will govern the system in case of toxicity? Let us assume that there are two possibilities - single-body governance and multiple-body governance.

The first possibility suggests that a single unit of governance will handle all the aspects of Metaverse. If in any case the DAO system is filled with unethical behavior and an incompetent environment, the final call would solely be based on the single unit of governance. The aforementioned scenario is a step away from dictatorship.

However, the second possibility is on multiple layers of governance. If a different aspect of the Metaverse system is handled by a different unit of governance, the decision will be inclusive of the majority voices. Not only does this solve the issue of dictatorship; however, it further extends to inclusive, trustworthy, diverse, and transparent governance. Referring back to the paper by Fernandez and Hui, a governance system that extends to an inclusive, trustworthy, and diverse governance is considered ethical governance. Therefore, the second possibility possesses an ethical standpoint that a single-body government can never address otherwise.

4. Conclusion

In this paper, I proposed a new view into the structure of governance of Metaverse. In that regard, I claimed Metaverse should be governed by multiple governance structures. Then I argued that the choice of having multiple bodies in the governance of Metaverse addresses equality through Aristotle's and Rawl's definitions of equality. Furthermore, I extended my argument to stress

the importance of my thesis by answering questions presented by the World Economics Forum, which wasn't ethically answered otherwise. With Fernandez and Hui's paper, I based my groundwork to identify a system that places emphasis on trust, inclusivity, diversity, and Human Rights. In conclusion, I hope the proposed view of governance in Metaverse will steer the ever going debate on the governance of Metaverse in a direction of different structures of governance. Since Metaverse is a hot topic at the moment and the market is expected to be \$824.53 billion USD by 2030, it is high time we design a structure of governance that makes the industry ethical in time.

References

Fernandez, Carlos, and Pan Hui. *Life, the Metaverse and Everything: An Overview of Privacy, Ethics, and Governance in Metaverse*. 25 Mar. 2022, arxiv.org/pdf/2204.01480.pdf.

Bascom, Tom. "Governance of the Metaverse." *Www.linkedin.com*, www.linkedin.com/pulse/governance-metaverse-tom-bascom/.

"Who Will Govern the Metaverse? (No, It Won't Be Facebook)." *XR Today*, 23 Dec. 2021, www.xrtoday.com/virtual-reality/who-will-govern-the-metaverse-no-it-wont-be-facebook

University, Santa Clara. "Technology and Engineering Practice: Ethical Lenses to Look

Through." *Www.scu.edu*,

www.scu.edu/ethics-in-technology-practice/ethical-lenses/?s=09. Accessed 10 Nov. 2022.

"Who Will Govern the Metaverse? (No, It Won't Be Facebook)." XR Today, 23 Dec. 2021, www.xrtoday.com/virtual-reality/who-will-govern-the-metaverse-no-it-wont-be-facebook

Li, Cathy. "Who Will Govern the Metaverse?" *World Economic Forum*, www.weforum.org/agenda/2022/05/metaverse-governance/.

Ziwei, Puah. "Travis Scott Reportedly Earned \$20million from 'Fortnite' Event." *NME* | *Music, Film, TV, Gaming & Pop Culture News*, 2 Dec. 2020,

www.nme.com/news/gaming-news/travis-scott-earned-20million-fortnite-concert-event-2 829792.

Metaverse, Adidas. "Adidas Originals: Into the Metaverse." *Adidas.com*, 12 Oct. 2022, www.adidas.com/metaverse.

Yang, Qinglin, et al. "Fusing Blockchain and AI with Metaverse: A Survey." *IEEE Open Journal of the Computer Society*, 2022, pp. 1–15, https://doi.org/10.1109/OJCS.2022.3188249.

Voshmgir, Shermin. "Web3, Blockchain, Cryptocurrency: A Threat or an Opportunity? | Shermin Voshmgir | TEDxCERN." *Www.youtube.com*, www.youtube.com/watch?v=JPGNvKy6DTA.

IBM. "What Are Smart Contracts on Blockchain?" *IBM*, 2022, www.ibm.com/topics/smart-contracts

DAO, BLM. "Black Lives Matter DAO." *Black Lives Matter DAO*, blacklivesdao.org/. Accessed 10 Nov. 2022.

Frontera, Ernesto. "A History of 'the DAO' Hack | CoinMarketCap." *Coinmarketcap.com*, coinmarketcap.com/alexandria/article/a-history-of-the-dao-hack.

- ---. "Fusing Blockchain and AI with Metaverse: A Survey." *IEEE Open Journal of the Computer Society*, 2022, pp. 1–15, https://doi.org/10.1109/OJCS.2022.3188249.
- Research, Verified Market. "Metaverse Market Size Worth \$ 824.53 Billion, Globally, by 2030 at 39.1% CAGR: Verified Market Research®." *Www.prnewswire.com*, www.prnewswire.com/news-releases/metaverse-market-size-worth--824-53-billion-globa lly-by-2030-at-39-1-cagr-verified-market-research-301585725.html.
- Ibrahim, Danial. "How to Make Money in the Metaverse [25 Creative Ways]." *The Metaverse Insider*, 26 Sept. 2022,

 metaverseinsider.tech/2022/09/26/how-to-make-money-in-the-metaverse/#:~:text=There
 %20are%20several%20ways%20to%20start%20earning%20money%20in%20the.

Frankenfield, Jake. "Nonce." *Investopedia*, 2019, <u>www.investopedia.com/terms/n/nonce.asp</u>.

- Sharma, Toshendra Kumar. "Blockchain & Role of P2P Network | Blockchain Council."

 **Bockchain Council*, 31 May 2020,

 **www.blockchain-council.org/blockchain/blockchain-role-of-p2p-network/#:~:text=As%2

 Oblockchain%20is%20a%20decentralized.
- Dictionary, Oxford. "Metaverse Noun Definition, Pictures, Pronunciation and Usage Notes |

 Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com."

 Oxfordlearnersdictionaries.com, 2022,

 $\underline{www.oxfordlearnersdictionaries.com/us/definition/english/metaverse\#:\sim:text=\%2F\%CB\\ \%88met\%C9\%99v\%C9\%9C\%CB\%90rs\%2F.$

Blockchain, Oodles. "How to Use Blockchain in the Metaverse | Oodles Blockchain."

Blockchain. Oodles, 26 Sept. 2022,

 $block chain.oodles. io/blog/how-to-use-block chain-in-the-metaverse/\#: \sim: text=Block chain \%20 technology \%20 was \%20 used \%20 to.$