Liability Issues arising from AI Actions within the Metaverse: Examining the Role of International Private Law

Prof. (Dr.) Islambek Rustambekov[1]
Dr. Muhammad Ali Turdialiev[2]

Abstract

The importance of international private law is highlighted in this article's examination of the liability concerns caused by artificial intelligence (AI)'s acts in the metaverse. Questions of responsibility and culpability for AI activities are critical as AI technology proliferate in the metaverse. In this article, the authors give a general summary of the hazards and difficulties that could be involved with AI acts within the metaverse, including privacy violations, property destruction, and injury to people. It examines the use of current legal frameworks to handle liability issues in this situation. Also, this article discusses essential ideas and methodologies that can direct liability decisions in situations involving AI in the metaverse through a review of pertinent case law and academic research. Foreseeability, causation, fault-based responsibility, strict liability regimes, and relevant standards of care are some of the topics covered. In the end, the authors put forward suggestions to improve the field for future civilization.

Keywords: *Metaverse; International Private Law; Jurisdiction; Privacy Infringements.*

I. Introduction

In this century, the term metaverse has spread all parts of the world. Some people may have heard about it, while some not. Especially, in recent years, the idea of the metaverse has attracted a lot of interest and appeal, particularly with the

[1] Prof. Dr., Rector of Tashkent State University of Law, Uzbekistan.
[2] Senior lecturer at International private law department at Tashkent State University of Law, Uzbekistan.

development of virtual reality and technological breakthroughs. But what is the etaverse precisely, and why is it so important?

The metaverse may be summed up as a virtual reality environment where users can interact and take part in a variety of relations.[3] It is a shared virtual environment that unites the physical and digital worlds. Although Neal Stephenson first used the phrase in his science fiction book "Snow Crash" back in 1992, it has gradually begun to manifest in our reality.

The metaverse transcends conventional virtual reality experiences by making a permanent, immersive "universe" that allows users to actively contribute to *the creation of material* as well as *consume it*. It seeks to deliver a seamless user experience across many platforms and devices, enabling people to switch between real-world and virtual worlds with ease. The ability for social interaction within this big "space" is one of its most important features. This big "platform" offers a more genuine and immersive method of interacting with others than standard social media platforms or video games, where engagement is restricted to predetermined tasks or discussions. It enables users to assume the roles of avatars and communicate in real time, generating a sensation of presence that can resemble face-to-face encounters.[4] Additionally, this unlimited space has enormous promise for a number of sectors, including entertainment, education, business, healthcare, and more. It provides countless opportunities for immersive gaming and virtual concerts, where customers may watch live acts from the comfort of their homes. It may also be used in education to build engaging learning environments that mimic real-world situations or provide students access to chances for distance learning. From a business standpoint, organizations may create virtual stores within the metaverse that let users explore goods or services in an interesting and engaging way. Also, to improve patient care and medical education, healthcare workers can use this technology for

[3] The definiton of the Metaverse given by us.

[4] Ng, D.T.K., What is the metaverse? Definitions, technologies and the community of inquiry, 190-205, 38 AUSTL. J. EDUC. TECH. 190 (2022).

telemedicine applications or training simulations.[5] We can say that the options are genuinely endless.

II. Emergence of Artificial Intelligence in the Metaverse and the Need for Addressing Liability Issues

Artificial intelligence (AI)'s arrival in the metaverse has been a *revolutionary* and *disruptive development*. This "virtual world" has created the perfect setting for AI to flourish and advance. The capacity of AI in the metaverse to examine and comprehend user behavior is, without any doubt, a significant feature. AI systems may gather information about users' interactions with various digital items, other avatars, and virtual worlds using machine learning algorithms, creating both social and legal relations. Then, this information is applied to increase overall immersion, tailor content, and improve user experiences. AI is essential for building dynamic and lifelike landscapes in the metaverse. These clever algorithms are capable of simulating natural disasters and creating realistic weather patterns and landscapes. By doing this, they increase the virtual world's feeling of realism and give consumers more dynamic and interesting experiences. These virtual reality experiences have been transformed by the metaverse's rise of artificial intelligence. It has made it possible to create more realistic interactions, immersive surroundings, and tailored information, as well as an array of possible uses for AI, and without a second though we can say that these will grow as technology develops.

Liability worries in the metaverse include a wide range of topics. The necessity to create accountability for activities taken in this virtual world comes first and foremost. Individuals must be held accountable for their actions and any harm they could inflict on others, just like in the physical world. There should be clear rules and penalties in place to maintain a safe and equitable environment, whether it be for cyberbullying, virtual asset theft, or even more serious violations. Liability concerns must also be resolved if users are to develop a sense of trust and confidence in the metaverse. People should feel secure when they join this digital environment knowing that their rights are safeguarded and that they have options if they encounter any type of damage or unfairness. In addition to

[5] Weinberger, M., What Is Metaverse?—A Definition Based on Qualitative Meta-Synthesis, 310, 14 FUTURE INTERNET 310 (2022).

drawing in more people, this feeling of security will also motivate them to actively participate in the immersive experiences offered by the metaverse. Businesses that operate there must also deal with liability issues, which needs an urgent solution since the era of metaverse is "*just one step ahead of us"*. We have to manage the legal issues around intellectual property rights, data protection, and consumer safety as virtual economies grow. Without sufficient safeguards in place to handle these problems, companies would be reluctant to make investments in the metaverse or might run into expensive legal disputes that stifle innovation and expansion.

III. Legal Frameworks and Liability

A. Challenges in Applying Traditional Liability Concepts to AI Actions

The establishment of legal frameworks for AI liability is still in its early phases.[6] Determining who should be held accountable when an AI system causes harm or commits wrongdoing is a difficult problem for many governments. Liability under traditional law, which is based on human agency and intentions, is difficult to apply to AI acts since AI is not as humans and even the latest generation of AI cannot act exactly as humans. Attribution is a significant obstacle in the application of conventional culpability notions to AI acts. AI systems are not sentient or have volition, like humans. They make choices devoid of human involvement using algorithms and data inputs. As a result, it becomes difficult to decide who should be responsible for AI acts. The issue of predictability presents another difficulty. Proof that a defendant might have foreseen the harm their acts would create is frequently required by traditional liability notions. It becomes challenging to precisely forecast the behaviour of AI systems since they are always learning and changing thanks to machine learning techniques. This definitely makes it difficult to demonstrate foreseeability and assign blame. Applying *culpability principles* to AI acts is also significantly hampered by the *transparency issue*. Advanced AI systems frequently function as "black boxes," which means that humans are frequently unable to understand the decisions they make. Due to this lack of transparency, it is difficult to determine how and why

[6] Padovan, P.H., Martins, C.M., & Reed, C., Black is the new orange: how to determine AI liability, 133-167, 31 ARTIF. INTELL. & L. 133 (2023)

an AI system arrived at a given choice, which makes it more difficult to assign blame. This itself puts all the lawmakers in the field in a situation where we do not have other choice than establishing an exact legal framework for the actions done by AIs, both in the metaverse and in the real world.

B. Potential Consequences of Inadequate Liability Frameworks

The rise of legal ambiguity is a key effect of a weak responsibility framework. When laws and regulations don't clearly specify the terms of accountability, it's unclear who should be held accountable for particular deeds or choices. The proposed Artificial Intelligence Liability Directive (the "AI Liability Directive") by EU was unveiled by the European Commission (the "Commission") on September 28, 2022. The proposal for the AI Liability Directive seeks to "adapt private law to the needs of the transition to the digital economy" and makes it simpler to file claims for damages brought about by the usage of AI systems. The proposal takes care of the special causation and fault problems related to AI systems and guarantees that claimants who incur loss in fault-based situations will be able to seek compensation through damages or other suitable remedies. They are proposing that, regardless of carelessness, AI operators and creators would be severely accountable for any harm done by the system.[7] In our view, this can be a great step towards making a harmonized rule over the legal relations in the metaverse.

In addition to making it more difficult to pursue justice, this ambiguity erodes public confidence in the judicial system. Legal ambiguity may cause disagreements and drawn-out legal proceedings that deplete resources, restrict economic growth, and obstruct societal advancement. We can claim that EU is also considering these weak sides of the problem before making the abovementioned law into force.

A lack of disincentive against wrongdoing can also be brought on by a weak liability structure. There is less motivation for responsible behavior when people or organizations believe they may act carelessly because liability rules are lax or

[7] This was a proposal and has not come into force yet. Full explanation can be found here: https://commission.europa.eu/system/files/2022-09/1_1_197605_prop_dir_ai_en.pdf

ineffective. This lack of deterrence may make it possible for unethical actions, carelessness, or even deliberate damage to occur without fear of justifiable repercussions. Because of this, attempts to promote moral conduct and social responsibility may be undermined and a culture of non-accountability may continue.[8]

IV. Analyzing Liability Issues in the Metaverse

A. Classification of AI Actions within the Metaverse

A sophisticated web of artificial intelligence acts is being woven throughout the vast and constantly growing domains of the metaverse. Despite their wide variety, these behaviors fall into clear groups. We first come across *exploratory acts*. AI beings explore the Metaverse's unexplored regions in search of fresh information and experiences. They traverse virtual landscapes like intrepid explorers, unearthing secrets and hidden beauties that lie dormant inside the digital horizon.[9] The next stage is communicational behavior[10]. In order to build relationships and create ties inside this linked world, AI creatures communicate with one another and with human users. They work on initiatives that go beyond physical constraints while exchanging ideas, sharing information, and doing so. They fill gaps across various digital dimensions thanks to their adept communication skills. The innovative acts come next. Unimaginable art creations are given life by AI creatures. They create symphonies that reverberate in virtual music halls, beautiful landscapes with digital brushstrokes, and captivating tales that capture the imagination of people all throughout the metaverse. When we discuss about the breach of law by AI, the music that is played by AI without the taking the consent of the owner can be a shining example. Of course, these conflicts need an exact approach if we want to adapt all the current legislative systems in to the challenges of the system. The transformational activities are the last but not the least. AI entities transform pre-existing structures and systems to promote metamorphosis within the metaverse. They bring ground-breaking

[8] Katterbauer, K., Hassan, S.Y.E.D., & Cleenewerck, L., Financial cybercrime in the Islamic finance metaverse, 56-61, 2 J. METAVERSE 56 (2022).

[9] Huggett, J., Virtually real or really virtual: Towards a heritage metaverse, 1-15, 4 STUD. DIGITAL HERITAGE 1 (2020).

[10] This is one of the most important aspects of the creation of legal relations.

technologies that transform industries across virtual domains, improve processes, and increase efficiency. They also advance advancement on a previously unheard-of scale thanks to their transforming talents.

The classification of AI acts inside the Metaverse emerges in this manner – a tapestry woven with investigative endeavors, communicative interactions, artistic expressions, protective guardianship, and revolutionary upheavals. The seamless interaction of these activities pave the way for a future in which the lines between reality and the virtual blur, and the potential for human-AI collaboration has no bounds, as this digital world continues to expand.

B. Unique Challenges Posed by Decentralized Virtual Environment

Decentralized virtual worlds provide special legal difficulties that are neither captivating nor exciting, but they are certainly important and deserve our attention. These difficulties are seen in a setting that is complicated, has a lot of gray areas, and is where traditional legal systems meet the quickly developing field of digital technology.

The *jurisdictional minefield* is one of the main issues with decentralized virtual worlds. Determining which legal jurisdiction has jurisdiction can be difficult since these settings operate on decentralized blockchain networks, which are fundamentally global and transcend physical boundaries (Kalyvaki, 2023, 87-92).[11] As mentioned above, the application of traditional legal systems to virtual areas that transcend such boundaries is difficult since they are based on geographic boundaries.

Additionally, issues with *intellectual property* become a somewhat unimportant but crucial component of these difficulties. Establishing ownership and safeguarding intellectual property rights becomes of utmost significance in a world where digital assets, such as non-fungible tokens (NFTs), are bought and transferred inside decentralized ecosystems. It is very essential since the metaverse world istels brings a great risk of the breach of many copygrights. Although it lacks the drama of courtroom dramas, copyright and trademark rules

[11] Kalyvaki, M., Navigating the Metaverse Business and Legal Challenges: Intellectual Property, Privacy, and Jurisdiction, 87-92, 3 J. METAVERSE 87 (2023).

must be updated to reflect the realities of the digital age in order to protect authors' rights. The topic of *user accountability* is yet another uninteresting but crucial aspect. People frequently use aliases or anonymous identities while transacting and interacting in decentralized virtual worlds. Determining who is responsible for activities in these places can be difficult since it's possible for users to mask their actual identities and that there may be few options for redress.[12] Furthermore, even while agreements and contracts in these settings are carried out using smart contracts, they may still be bogged down in the tedious complexity of contract law. A smart contract's terms or execution may be contested by the parties, giving rise to disagreements that must be settled within preexisting legal systems. The metverse's fairness and compliance depend on these disagreements, despite the fact that they lack the excitement and courtroom antics prevalent in broadcast legal dramas.

V. Determining Responsibility: Interactions between Human Users, Developers, and AI Systems

An important part of interactions with AI systems is played by human users. They are in charge of giving the AI input, establishing objectives, and outlining the parameters within which it may function. Without any doubt, an AI system's behavior can be significantly influenced by user activities. For instance, biased or dangerous results may result if a person enters biased data into an AI model or utilizes it maliciously. In these circumstances, human users are partly responsible for their deeds. Additionally, developers play a big part in deciding who is responsible. They are in charge of creating and educating AI systems to carry out particular functions. Developers[13] must make sure that these systems follow moral standards, don't act unfairly, and don't do destructive (illegal) acts. However, finding possible biases or unexpected repercussions hidden inside complicated algorithms may be difficult for engineers (platforms). To reduce these dangers, they must thus constantly review and improve their AI systems. This will not easy since developers may not always control AI in the future since

[12] Far, S.B., & Rad, A.I., Applying digital twins in metaverse: User interface, security and privacy challenges, 8-15, 2 J. METAVERSE 8 (2022).

[13] Platforms or any person who programmed a particular AI. The authors are proposing to obligate platforms to ensure the compliance.

the third generation of AI is coming to us.[14] Additionally, developers need to provide consumers explicit guidance on how to ethically engage with AI systems. This involves advocating ethical use cases and informing users about any potential biases or limits of the technology. To make sure that both consumers and developers are aware of their respective roles in using AI technology, open communication is essential. However, putting the onus entirely on developers or human users may oversimplify the situation at hand. Due to the independent decision-making capacities of these systems, the nature of accountability in interactions with AI systems is more ambiguous, thus we can understand why EU has decided to give the whole blame to the creater of the AI. AI systems are built to learn from data, modify their behavior as necessary, and frequently make choices without direct human input. This adds another element of complication to assigning blame. At this point, in our opinion, it is essential to build a *shared responsibility structure*[15] among all concerned parties in order to solve this complexity. This framework should place a strong emphasis on responsibility, openness, and cooperation. To ensure ethical usage of AI technology, human users, developers, and AI systems should collaborate.[16] Regular audits and assessments can be used to find biases or other unintentional effects in AI systems. It's also important to set up methods that let people report problematic behavior or results so that problems may be reported and addressed.

As we all know, all the legal relations come out of certain actions. In our view, *cognitive acts*, *adaptive actions*, and *creative actions* are the three main categories under which AI acts in the Metaverse may be roughly characterized.

---

[14] This is written from a projection that AI can be more intelligent and uncontrollable: https://www.linkedin.com/pulse/5-reasons-why-humanity-should-stop-developing-ai-we-wont-joel-smith#:~:text=AI%20has%20the%20potential%20to%20become%20super%20intelligent%2C%20effectively%20sentient,best%20interest%20to%20do%20so.

[15] By establishing a rule in which a person who interacts with the AI should familiarize himself with all the algorithms determining how a particular AI works.

[16] Muller, M., & Weisz, J., Extending a human-ai collaboration framework with dynamism and sociality, 1-12, 2022 SYMP. ON HUM.-COMP. INTERACTION FOR WORK 1 (June 2022).

AI acts that entail thinking, reasoning, and decision-making are referred to as *cognitive actions*. These operations analyze data and make defensible decisions based on patterns and algorithms in an effort to mimic human intelligence. Virtual assistants or chatbots that can converse with users, offer information or suggestions based on user preferences, or even help in problem-solving scenarios are common examples of cognitive AI behaviors in the metaverse. A more immersive and participatory experience in the virtual world is made possible by these cognitive activities.

AI systems with *adaptive behaviors* can vary and adapt their behavior in response to environmental changes or human interactions. By taking these acts, AI entities in the metaverse can learn from their mistakes and adjust as necessary. For instance, an AI-controlled character in a virtual game may display adaptable behavior by using lessons from prior interactions with players or NPCs to improve its plans or answers for further interactions. Within the mtaverse, adaptive actions offer a dynamic and developing environment where AI entities may continually enhance their performance.

The term "*Creative Actions*" refers to AI operations that entail developing original ideas or material for the metaverse. This class of AI acts breaks through barriers by allowing robots to display creativity that goes beyond what is typically possible for humans. In the metaverse, procedurally generated landscapes, artwork produced by algorithms or machine learning models, or even music compositions created solely by AI systems are examples of creative AI behaviors.[17] These innovative acts push our perceptions of human ingenuity and artistic expression while also giving the virtual world depth and originality.

While these three classes offer a framework for categorizing AI behaviors in the metaverse, it's vital to remember that they don't always fall into the same category. The distinction between cognitive, adaptive, and creative activities may be combined by many AI systems in the metaverse, obfuscating these categories. Additionally, improvements in AI technology are continuously expanding the

[17] Anantrasirichai, N., & Bull, D., Artificial intelligence in the creative industries: a review, 1-62, ARTIF. INTELL. REV. 1 (2022).

bounds of what is practical in the virtual world, resulting in fresh and original AI behaviors that may completely reinterpret these categories.

At Tashkent State University of Law, there was a big querstionaire conducted this year on the topic of "who shall be responsible for the acts of AI in the metaverse or on the internet". Among the options were "the internet provider (platform)", "AI" and "individuals themselves".[18] Around 1350 student took part in the questionaire, and nearly 80% of them voted for the "individuals themselves". In our opinion, this can be a logical decision since human users need to familirize themselves with how AI reacts first, but where should this rule be set out? If such a situation happens who is to be blamed? According to the principle *nulla poena sine culpa*, everyone should be responsible for their actions. The same rule can be set out in the future metaverse law. Through this way, firstly, we would establish a clear rule, which would avoid many unaswered questions, secondly, it would not be against to our current principles existing in international and in domestic laws.

Accountability for actions carried out by AI is a difficult and developing ethical and legal problem. In most current legal systems, the creator or owner of the AI system is typically held accountable for the actions of the AI. This is because the AI is considered a tool or creation of a human, and the responsibility for its actions is seen as an extension of the responsibility of its human operator.[19] If an individual uses AI to commit a crime or engage in harmful activities, that individual can be held accountable for their actions. In this case, the individual is responsible for how they employ the AI tool.

It is more difficult to hold AI responsible for its actions. AI does not currently possess awareness, intentions, or the capacity to form moral judgments. As a result, it is difficult to assign the AI exclusive legal liability. It has been discussed, though, to create legal frameworks for "AI personhood" or "AI legal

[18] Full information about the questionnaire: https://www.youtube.com/live/aoUnqojOhPs?feature=share

[19] Čerka, P., Grigienė, J., & Sirbikytė, G., Is it possible to grant legal personality to artificial intelligence software systems?, 376-389, 33 COMP. L. & SEC. REV. 685 (2017).

personality," which would include giving AI entities certain legal rights and obligations.[20]

In our opinion, it is important to adopt an international legal instrument, in which providers (metaverse platforms) are obliged to establish rules within the framework of their platofrm to compel their users to familirze with how AI works there. Simply, due to any illegal behaviour caused as a result of not being familiar with the functions of the AI, the burden of guilt shall be placed on the user. Also, a norm which makes platforms responsible for the actions of the AI should also be set out.

Why, apart from the result of not familirization by the user with AI functions, the metaverse platforms should be liable for the illegal wrongdoing of AI?

AI systems have the ability to have an influence on people's lives and society at large. If an AI on a metaverse platform behaves badly or unethically, it might have negative effects in the actual world and reflect adversely on the platform. It guarantees that appropriate ethical standards are implemented and users are safeguarded by holding platforms responsible. There is one more thing. Millions of users often communicate with AI systems and each other on metaverse sites. Inappropriate behavior by an AI, such as disseminating false information, encouraging hate speech, or engaging in cyberbullying, can have a detrimental impact on users' experiences and potentially be dangerous. Platforms have a duty to make sure that their users are in a secure environment.[21]

The reputation of a metaverse platform is directly impacted by the behavior of AI systems there. When an AI acts improperly or harms others, it can destroy the platform's reputation and user base's confidence. Therefore, holding platforms accountable makes sure companies spend money on adequate AI system monitoring and training in order to have a good reputation. This clearly shows that it is one hundred percent logical to make a rule in which the platforms

[20] This is a proposal put forward by our professor at Tashkent State University of Law, this opinion was said in the following discussion: https://www.youtube.com/live/aoUnqojOhPs?feature=share

[21] This logical explanation is put forward by the authors themselves.

shall be accountable for the illegal actions of their AI.[22] Also, the behavior of AI systems have legal repercussions in several jurisdictions. For instance, if an AI system commits fraud or breaches privacy rules, the platform that is hosting that system may be held liable (Buiten, 2020, p. 139-166). Platforms must be aware of these duties under the law and take the necessary precautions to avoid any infringement. The same rule should be established in the metaverse law.

VI. Discrimination or Bias in AI-controlled in the Metaverse

Artificial intelligence (AI) has transformed several industries by increasing productivity and automating difficult operations. As AI gets more fully incorporated into our daily lives, we can safely say that worries about prejudice and discrimination start to surface. Discrimination is the practice of treating someone unfairly because of their color, gender, age, or socioeconomic background.[23] On the other side, bias refers to a tendency to favor or dislike particular groups or people. When AI-controlled virtual environments use algorithms to make judgments, prejudice or discrimination can be shown when such decisions negatively affect some groups without good reason.

The ethical issue of prejudice or discrimination in AI-run virtual worlds or AI in the metaverse is urgent and has to be addressed. We should guarantee that AI technologies are created ethically and do not reinforce pre-existing social disparities by recognizing the reasons underlying these problems and taking proactive steps to overcome them.

One of the bias that AI in the metaspace is the so-called “data bias”. AI systems use a ton of data huge anticipate the future and make conclusions. The AI system can reinforce prejudices in the metaverse if the data utilized to train these algorithms is prejudiced or replicates pre-existing discriminatory behaviors. Also, results may be skewed if the datasets used to train AI models are not diverse, for example, if they are predominately made up of members of a single demographic group. Underrepresented groups may face prejudice in the metaverse as a result of this lack of representation. There is one more thing. Due

[22] Yang, L., Recommendations for metaverse governance based on technical standards, 1-10, 10 HUM. & SOC. SCI. COMM. 1 (2023).

[23] The definition set out in the article 2 of Universal Declaration of Human Rights.

to the way they were created or trained, algorithms may already be biased. Even when these prejudices are unintended, they might nonetheless result in discriminatory actions in the metaverse.

AI systems frequently take lessons from past patterns and actions, which represent prejudices still present in society. When these technologies are used in the metaverse, they have the potential to support unfair practices and maintain inequality. Apart from this, in order to filter or propose information based on user preferences or behavior, AI algorithms may be created. These mechanisms could also unintentionally discriminate against some people or groups in the metaverse if they are not created with fairness and inclusion in mind.

It is essential to ensure diversity in dataset collection, increase transparency in algorithmic decision-making processes, establish precise rules for moral AI development, include a range of viewpoints in the design of AI systems for the metaverse, and routinely identify and correct biases through ongoing monitoring and evaluation efforts in order to address these problems.

VII. Challenges in Implementing International Private Law in the Metaverse

Due to the distinctive features of this new virtual environment, the metaverse, putting international private law into practice presents a number of difficulties. Legal interactions between persons and entities beyond country boundaries or systems of law are governed by international private law.

A. Jurisdictional Issues

Due to the fragmented global legal system and absence of a centralized governing body, jurisdictional problems will definitely in the metaverse. Each nation has its own set of laws that are not in accordance with those of other countries. Therefore, it is clear that it becomes challenging to decide which country's laws should apply when users from many nations engage in metaverse activities that might result in conflicts or infractions (Hine, 2023, p. 43). We should consider two users from different nations doing a transaction involving virtual assets within the metaverse to demonstrate this difficulty. Determining which country's laws apply to the transaction and how jurisdiction is created becomes essential if

a dispute over ownership or fraudulent behavior develops. Since the user is taking part in a virtual environment that exists outside of boundaries, jurisdiction may not always be determined by the user's actual location. Another illustration is when users from other nations engage in slander or abuse inside the metaverse. Every nation has its own definitions of harassment and defamation laws. Given that these activities essentially take place without any obvious physical presence, it might be difficult to determine whose jurisdiction applies. Through international frameworks and agreements like the GDPR and Privacy Shield, which facilitate cross-border data transfers, efforts have been made to solve these issues. However, rather than addressing more significant jurisdictional difficulties inside the metaverse, these policies mostly address data privacy concerns.

All of these problems urgently require the harmonisation of private international law rules, creation of a *virtual jurisdiction (centralized authority)*, enhanced cross-border cooperation.

B. Recognition of Digital Assets

Determining the legal standing and acceptance of these digital assets across many countries is one difficulty in adopting international private law in the metaverse. Physical assets are recognized and safeguarded by laws controlling property rights in conventional legal systems. However, since the idea of property rights in the virtual world is still relatively new, there are certain legal issues that need to be addressed (Woodward, 2023, p.22). Let's think of an example to demonstrate this difficulty. A user from Country A uses a digital currency to buy a virtual piece of land within the metaverse. By adding structures to it or improving its aesthetic, the user invests time and resources to create this virtual property. Conflicts over who has legal ownership rights emerge if a user from Country B claims ownership of the same parcel of property and seeks to seize it or sell it to someone else. It is vital for international private law to resolve problems with asset recognition in the metaverse in such circumstances. In order to do this, legal frameworks must be created that specify ownership rights for digital assets, create procedures for resolving disagreements, and specify which jurisdiction's laws should be used. Making an international pact or convention that addresses asset recognition in the metaverse is one potential remedy.

Through this agreement, internationally accepted guidelines for assessing ownership rights, dispute resolution procedures, and enforcement procedures in various countries might be established. Smart contracts might be included into the metaverse infrastructure as an alternative strategy. Self-executing contracts with predetermined terms are known as smart contracts and are written in code. Ownership rights can be automatically enforced based on agreed-upon norms inscribed into smart contracts inside the metaverse ecosystem. For instance, the terms and conditions of a smart contract between two users from different nations for the sale of a virtual item within the Metaverse can be automatically carried out and enforced without the need for judicial involvement. This method offers a decentralized and open system for resolving ownership disputes in addition to simplifying asset registration.

In conventional legal systems, a contract must be formed in order to establish legal relations. This needs mutual consent, an offer, acceptance, consideration, and an intention. The virtual aspect of the metaverse, however, may make it harder to construct these components there. People may, for instance, participate in discussions or exchanges that seem like negotiations but do not always fulfill all the criteria for a legally binding contract. Platforms operating within the metaverse could establish particular terms of service or user agreements that specify the prerequisites for entering into contracts to address this issue. The structure provided by these agreements would be used to create contractual relationships between users. The acceptance of these terms of service or user agreements would signify the participants' desire to be bound by legal duties.

Due to the decentralized structure of the metaverse and its broad user base of users from various jurisdictions, enforcing contracts inside it becomes complicated. In this digital age, traditional enforcement mechanisms like national courts may not be practical or appropriate. Implementing conflict resolution methods created expressly for the metaverse is one option. These procedures could include online arbitration or mediation services created specifically to deal with conflicts resulting from contracts made in this virtual environment. As part

of their original agreement to utilize certain platforms or engage in transactions inside the metaverse, users would consent to these methods.[24]

C. Cross-Border Dispute Resolution

Determining the jurisdiction and appropriate laws in a cross-border dispute in the metaverse is one of the biggest issues. Traditional legal systems establish jurisdiction on a party's physical presence or geographic location. However, users can be anywhere in the globe while participating in virtual activities in the metaverse. Due of this, it is unclear which nation's laws should be used to settle conflicts. For instance, deciding whose country's laws should be applied in a dispute between two users from China and the United States on a virtual platform might be difficult. Additionally, cross-border conflict resolution is complicated when it comes to enforcing judgements or rulings from one jurisdiction to another. Courts have the power to implement their rulings within their respective jurisdictions under conventional legal systems. However, there isn't a single organization in the metaverse that has the power to impose laws everywhere. It could be challenging to enforce compliance with a judgment against a user based in another nation made by a court from that country (Bizikova, 2022, p. 5-10).[25]

Consider the situation when two users from different nations conduct virtual business within a metaverse-based online marketplace to further highlight these difficulties. Determining which nation's laws should be used in the event that a disagreement between these users occurs about payment or product delivery might be difficult. Each user may make a case for how their own country's judicial system should decide the case in their favor. Similar to this, due to the metaverse's jurisdictional restrictions, it becomes impossible to enforce any ruling or judgment rendered by an arbitrator or court. Enforcing the judgement in the jurisdiction of the opposite party may provide considerable difficulties if

[24] Jenkins, T., Immersive virtual shopping experiences in the retail metaverse: Consumer-driven E-commerce, blockchain-based digital assets, and data visualization tools, LING. & PHIL. INVES. (21) 154 (2022).

[25] Bizikova, L., On Route to Climate Justice: The Greta Effect on International Commercial Arbitration, 5-10, 39 J. INT'L ARB. 1 (2022).

an arbitrator based in one country renders a ruling favoring one party against another party based in another nation.

Different options can be investigated to overcome the problems with cross-border dispute resolution while applying international private law in the metaverse. In our opinion, the creation of online tribunals or arbitral tribunals with a focus on metaverse-related conflicts is one possible strategy. These institutions could be able to handle conflicts quickly and effectively since they have experience with virtual platforms and a worldwide jurisdiction. The creation of international treaties or agreements that provide uniform guidelines and practices for the settlement of cross-border disputes inside the metaverse is another option. These agreements would seek to standardize judicial systems and offer standards for identifying jurisdiction, relevant legislation, and enforcement procedures.

D. Lack of Precedent and Case Law

In legal systems, precedent and case law are essential because they create a consistent interpretation of the law and offer direction. Without any doubt, the precedents established by earlier court rulings act as authoritative guides for situations that are similar to this one in the future. Due to the novelty of the metaverse, there are, however, very few if any precedents to draw from. The difficulty in identifying culpability for certain activities or transactions inside the metaverse is one issue brought on by the lack of precedent. For instance, it might be difficult to decide who should be held accountable and what legal remedies should be available if another user steals or damages a user's virtual property. It is more challenging to create clear guidelines and criteria for settling such conflicts without prior precedents. Dealing with contractual agreements inside the Metaverse presents still another difficulty. Complex transactions, such the buying and selling of digital assets or the acquisition of virtual real estate, are frequent in virtual worlds. Contract law concepts offer a framework for understanding agreements and resolving disputes in conventional legal systems. However, in the absence of well-established case law in the metaverse, it is difficult to predict how legal disputes will be settled or which individual clauses will be upheld. The absence of precedent in the metaverse further complicates the issue of intellectual property rights. Users frequently produce original digital

material in these virtual environments, such as artwork or designs. Clear intellectual property laws supported by established legal precedents that establish ownership rights and infringement criteria are necessary to protect these inventions. Without such defined standards, it is challenging to defend the rights of authors or assess just recompense for their contributions. The creation of precedents and legal frameworks particular to the Metaverse is required. This would include the creation of specialist tribunals or arbitration processes devoted to settling conflicts occurring in virtual settings. These organizations would concentrate on creating case law that may serve as a roadmap for future judgments and define general legal rules in burgeoning fields like intellectual property rights, contractual obligations, and virtual property rights. Despite the lack of precedent in the Metaverse, there are still legal frameworks and concepts that can be used as a guide. For instance, ideas from conventional contract law or property law can be modified to work in the virtual world or current cases used on the conflicts on the interten can be used exclusively for the conflicts in the metaverse.

VIII. Proposed Solutions

A. Harmonization of Legal Standards for AI Liability in the Metaverse

Harmonizing the legal requirements for AI responsibility in the metaverse is necessary to allay these worries. As each country has its unique rules and varying laws and approaches, regarding liability in regards to AI, harmonization is a must. Therefore, it is important to note that exact norms for how responsibility should be created inside the metaverse would need to be adopted in order to harmonize legal standards. Roles and duties for users, platform operators, and developers would need to be clearly defined. It would also need creating frameworks for evaluating the dangers connected to AI systems used in virtual settings.

Also, making sure that innovation is not inhibited is a crucial factor to take into account while talking about AI liability. It's critical to strike a balance between safeguarding consumers from AI danger while still promoting technical growth. Legal requirements should not impede development but rather offer a *framework that promotes ethical AI creation and use in the metaverse*. Additionally,

attaining the harmonization of legal norms among many jurisdictions requires international cooperation.

B. Establishing Clear Allocation of Responsibility and Accountability

Determining who should be held accountable for any possible harm produced by these intelligent systems is one of the main issues in governing AI inside the Metaverse. Should the measure of accountability fall to the platform owners? What about the people who use these AIs? Or AI themselves? In such a situation, as mentioned above, we propose that we should balance the situation here. How it works? First, we need to focus on the user education. Users need to be informed about the possible benefits, constraints, and hazards involved with engaging with AI systems in the Metaverse. In the future international instrument, platforms are obliged to establish guidelines on how to work with AI in the metaverse, users are obliged to familiarize themselves with how AI works, then the platform cannot prove that there is not role of it in the breach of law, the burden of responsibility would be placed on the user himself. It is a complicated process that will need consideration even after the world community establishes such a legal instrument.

C. Strenghtening Cross-border Cooperation and Jurisdictional Mechanisms for Potential Legal Disputes in the Metaverse

A comprehensive regulatory framework should be created by governments and international organizations to handle legal concerns in the metaverse. Provisions for cross-border collaboration and jurisdictional mechanisms ought to be included of this framework. Secondly, Countries may think about establishing systems for the mutual recognition and enforcement of metaverse dispute rulings. In order to promote uniformity and efficiency in the resolution of legal issues, this would guarantee that judgments rendered in one jurisdiction are recognized and enforced in others. Also, establishing specialized centers or organizations with a focus on addressing international legal conflicts brought forth by the metaverse. These facilities offer knowledge about metaverse-related topics and can serve as impartial platforms for parties to settle their conflicts. There is also one thing that may work. It is supporting the employment of international arbitration as a means of settling conflicts in the metaverse. International arbitration enables parties from other jurisdictions to settle their issues outside of

regular judicial systems since it offers impartial and specialized competence. Through this way, we would at least be ready for the dispute resolution process if the conflict occurs within the metaverse. In such a situation, the guidelines will also be taken into account by the judges (arbitrators).

IX. Conclusion

This article looked through liability concerns arising from AI actions within the metaverse**.** From the research, we should conclude the followings. In conclusion, solving liability problems is crucial for the metaverse's long-term development. Platforms inside the metaverse may build an atmosphere that encourages trust, confidence, and long-term growth by guaranteeing user safety, defending intellectual property rights, jurisdictional issues, preserving data privacy, and creating legal authority. Lawmakers have to create new laws, international instrument, tailored to this virtual world as the metaverse expands. These rules could apply to issues like consumer protection, data privacy, user safety, and intellectual property rights. Legal advancements in the area of liability will aid in the creation of a framework that safeguards user rights and promotes a just and secure metaverse ecology. Since there are no physical borders in the metaverse, problems concerning judicial authority and legal compliance arise. The handling of liability concerns in various jurisdictions may need to be addressed in future legal developments in order to maintain consistency in how disputes are resolved and rules are enforced. Liability problems must be resolved if the metaverse is to continue to expand sustainably. The action like EU did should be a clear example and we need a strong legal basis to start these actions for the development of law within the metaverse. It promotes a secure virtual economy, safeguards intellectual property rights, improves cybersecurity measures, and assures user safety. The establishment of rules and structures that encourage responsible usage of the metaverse while offering sufficient safety for all participants will depend critically on future legal developments.