Metaverse Technology and Criminal Law

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Abstract

Metaverse technology represents a paradoxical concept, both mysterious and divided within itself, as it simultaneously suggests reality and non-reality, truth and falsehood. It merges real life with virtual and augmented reality, creating a significant impact across social, economic, technological, and even legal domains. Given that the law is one of these affected areas, it necessitates a pragmatic and realistic integration of all technological data under a thorough legal framework. Despite the difficulties and their impact on the structure and content of the legislation, this research paper aims to address the Metaverse from a legal perspective, specifically focusing on criminal law.

Keywords

Metaverse;
Virtual Reality;
Augmented Reality;
Legal Framework;
Criminal Law.

تقنية الميتافيرس والقانون الجنائي

ملخص

تعد الثورة التكنولوجية ما يصطلح عليها العالم الافتراضي "الميتافيرس" المفردة الغامضة في حد ذاتها والمنقسمة في نفسها إذ أنها توهم بواقع ولا واقع في الوقت ذاته، حقيقة ولا حقيقة، تندمج فيها الحياة الواقعية مع واقعٍ افتراضي وواقعٍ مُعزز، محدثة بذلك طفرة حقيقة على كافة الأصعدة الاجتماعية والاقتصادية والتكنولوجية وحتى القانونية، ولما كان القانون أحد هذه الميادين المعنية مما يستدعي ضرورة إدماج واقعي وبراغماتي لجميع معطيات التكنولوجيا وتنظيمها في إطار قانوني محكم، وبالرغم من صعوبة ذلك وتأثيره على مضمون وشكل القانون، وعلى هذا الأساس جاءت هذه الورقة البحثية لمعالجة الميتافيرس من الجانب القانوني وتحديدا القانون الجنائي.

الكلمات المفتاحية

الميتافيرس؛
العالم الافتراضي؛
الواقع المعزز؛
الإطار القانوني؛
القانون الجنائي.

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Doi:

I- Introduction

The world is keeping pace with the current leap in modern technologies according to a new and renewed vision. No one can deny the technological transformation and the change that now affects all aspects without exception, covering all scientific, artistic, human, and social sectors to the point where the world has truly become a small village. This has enabled humans to obtain extraordinary facilities that were recently unattainable. Thanks to all these rapid and advanced technologies, humans can now live in a relatively complete virtual world through participation and interaction. What we once saw in science fiction movies has become a reality today, experienced in all its details. Virtual world technology, or what is termed "Metaverse," represents the latest advancement in technology after decades of evolution and progression in the web and internet world.

Although there is still noticeable ambiguity in defining a complete and clear meaning of the Metaverse and its nature, possibly because more work is needed to fully develop this technology, it can be said that the Metaverse combines technology for mixed reality (MR), augmented reality (AR), and virtual reality (VR). These technologies involve an unlimited number of people around the world interacting with each other through fictional avatars whose addresses are recorded on digital platforms with non-fungible digital assets (NFTs). It is noteworthy that Metaverse technology is an old technique for virtual reality used by doctors for surgical operations, helping pilots train for flying, and also in system management (Nour Eddine, 2022). Despite these extensive advantages, there is a significantly impactful negative aspect, particularly the crimes and violations affecting societal groups and potentially even states.

The issue is not simple in terms of the development in computer fields and social media, especially the use of the internet and the massive turnout of people towards these means. The phenomenon of rapid and successive development in information technologies and arts has led to the gradual reliance on technological environment terminologies, which contributes to entering the field of development and sustainable development. From this evolution, many new concepts have emerged, such as the knowledge society and the virtual world, creating numerous challenges. To create effective ways to update some controls, this can only be achieved within legal and judicial frameworks to limit the harmful consequences of improper and individual use, thus leading to criminal justice.

Based on the above, the question arises:

Study problem

The problem of the study can be formulated into the following two main questions:

What is Metaverse technology?

What are the legal issues raised by crimes through the Metaverse?

This modest study has adopted the descriptive-analytical approach by describing this technology, explaining its nature and components, and attempting to evaluate this technology by highlighting its positives and negatives. Additionally, it analyzes the various legal issues raised by crimes committed through the virtual world, also known as the Metaverse.

Study Structure

- Metaverse Technology: The Artificial Intelligence Revolution
- Exploring the Concept of Metaverse Technology
- Evaluating Metaverse Technology
- Legal Issues of Crimes through the Metaverse: The Necessity of Legal Framework
- Crisis of Legal Void
- Incompatibility and Inadequacy of Traditional Legal Adaptation for Metaverse Crimes

I. 1. Metaverse Technology: The Artificial Intelligence Revolution

The paths of modern technological advancement have penetrated all aspects of human life, leaving no door unopened where technology has not played a role in enhancing and developing various aspects of human existence (Abdel Rahman, 2022). Amidst the rapid developments of the technological revolution, one of the most significant outcomes has been artificial intelligence technologies, which have culminated in what is known as the Metaverse. This technology has led to profound transformations, suggesting instability in human life across all social, economic, and legal levels (Ibrahim, 2022).

In this context, legal scholarship emphasizes that addressing any legal concept requires an understanding of its definition. Thus, we will attempt to explore the meaning of this technology (First), and correspondingly, it is necessary to place this new technology under scientific scrutiny for evaluation (Second)

I. 1.1 Exploring the Concept of Metaverse Technology

The world today is undoubtedly experiencing a rapidly accelerating revolution in communication and information technology, commonly referred to as the Digital Revolution. This revolution results from the continuous and significant advancements in communication and digital technologies. Metaverse technology is arguably one of the byproducts of this

evolution. To understand its concept comprehensively, we must first look at the origin and history of this term (A), and then highlight its characteristics (B).

I. 1.1.1 Overview of the Origin and History of the Term Metaverse

It is commonly observed that Mark Zuckerberg, the American entrepreneur and programmer, founder and CEO of the social networking site "Facebook," was the first to announce this technology on October 28, 2021. He declared that Facebook would change its name to Meta and start building a future version of the internet called the "Metaverse." This announcement was part of his strategy to create a fictional virtual world, aiming to transform his company from a social service provider to a specialist in large-scale virtual worlds (Metaverse).

However, upon closer examination, it is evident that The science fiction book "Snow Crash" by Neal Stephenson from 1992 is when the term "Metaverse" originally arose. In this novel, there is a three-dimensional virtual world where humans interact with each other as fictional avatars and with computer programs that use artificial intelligence to solve various problems they encounter during interaction, known as Software Agents (Ibrahim, 2022).

Additionally, Ernest Cline used the phrase in his 2011 book "Ready Player One," which was turned into a movie in 2018. The story revolves around a teenage orphan trying to escape his real world into a virtual one, set in the speculative future of 2045 (Nour Eddine, 2022). The term "Metaverse" also featured in the 2009 film "Summer Wars," where the story centers on Twelfth-grader "Natsuki Shinohara" takes shy math prodigy "Kenji Koiso," who is a math whiz, to Ueda to celebrate her grandmother's 90th birthday. But he unintentionally becomes embroiled in hacking a virtual world using an artificial intelligence system called "Love Machine," one of the most famous science fiction films (Nour Eddine, 2022).

Regarding global companies and platforms, the Second Life platform was the first to use this term in virtual world platforms in 2000.

Notably, the term "Metaverse" consists of two parts: "Meta," a Greek word meaning "beyond" or "after," and "Verse," derived from "Universe," meaning the world or universe. When combined, "Metaverse" translates to "beyond reality" or "beyond the world," or the "otherworldly universe" (Mystakidis, 2022).

I. 1.1.2 Technological and Technical Significance

Some define the Metaverse as a vast social network that includes a hybrid of mixed reality, augmented reality, and virtual reality, which combines the possibilities of interaction, control, and three-dimensional (3D) settings with virtual reality and actual reality. Artificial Intelligence (AI) technologies are also involved, providing real-time, effective, and continuous interaction. This network involves an unlimited number of people worldwide, offering an immersive environment and a real sense of connection in virtual environments that closely resemble real-world settings, enabling various transactions such as communication and payment (Mystakidis, 2022).

(Jamila, 2022) defines the Metaverse as a three-dimensional virtual world that is neither real nor imaginary but lies between these two worlds. It allows users to enter it using specific tools and an animated avatar that represents them, known as an "Avatar." This enables users to engage in activities like shopping, meeting people, gaming, creating, and establishing their virtual worlds without leaving their place (Jamila, 2022).

Remarkably, (Mystakidis, 2022)said that Metaverse technology embodies a post-reality in which virtual and physical worlds are combined into a single, interconnected network that facilitates constant, multi-user interaction. It consists of VR and AR open-world games in which players are portrayed by real-time interacting avatars, creating an immersive experience (Mystakidis, 2022).

Mark Zuckerberg, the American entrepreneur and programmer, founder, and CEO of the social networking site "Facebook," describes the Metaverse as a virtual environment where a person can exist with others in digital spaces. These spaces are three-dimensional and allow users to interact as if they are actually within them, rather than merely viewing virtual spaces (Lucas & Taylor, 2021).

In this context, Metaverse technology has established an imaginative way for users to interact with each other through avatars registered on digital platforms with non-fungible tokens (NFTs). NFTs represent the latest technological advancements in intellectual property rights, being unique, encrypted digital assets that cannot be replicated or exchanged. They can include various electronic entities and elements such as GIF files, images, videos, audio clips, and more. Anything on the internet can be purchased and registered as an NFT, distinguishing them from cryptocurrencies and other digital entities by their non-exchangeable nature (Al-Amin, 2022).

After presenting various definitions regarding Metaverse technology, it can be said that there is still noticeable ambiguity in defining a complete and clear meaning of the Metaverse. This may be because there is still more work to be done to fully develop this technology. What can be concluded is that Metaverse technology represents a virtual environment that disregards the rules of time and space, where the real world and the virtual world are integrated through the embodiment of virtual characters known as avatars to conduct digital purposes.

I. 1.1.3 Characteristics of Metaverse Technology

In the midst of the ongoing technological and digital revolution, one of the most significant outcomes has been artificial intelligence technologies, culminating in what is known as the Metaverse. This technology has led to profound transformations, suggesting instability in human life across social, economic, and legal levels. It involves the integration of virtual reality and real reality with the possibility of interaction, control, and 3D environments, endowing it with unique features and characteristics.

One of the most prominent features of Metaverse technology is its unprecedented technological leap in the field of communication. It transports humanity from the real, lived reality to a fantastical virtual reality using advanced and continuously evolving technical tools. This technology promises endless innovations (Ibrahim, 2022).

Another characteristic is its transformation from a seemingly fictional virtual world to a concept with many real-world applications aimed at providing a distinguished world. Thus, Metaverse technology is neither an absolute reality nor pure fiction.

One of its distinctive features is its reliance on encryption technology, or what is known as electronic symmetry, and various digital technologies such as NFTs and blockchain technology. The first appearance of this technology was by its founder Satoshi Nakamoto when he mined the first Bitcoin block, known as the Genesis block, in 2009. This occurred during a Bitcoin exchange with the American programmer Hal Finney on January 12, 2009. Researchers and technicians realized that the network and technology behind this process provided a secure environment for transactions, asset preservation, exchange, and transfer. Its main features are decentralization, openness, distribution, consensus-based operation, and peer-to-peer technology. Additionally, it is immutable and time-sequenced. Due to technological and programming advancements, the Russian programmer Vitalik Buterin developed the first second-generation blockchain application, known as the Ethereum platform, in 2013, which forms the basis for current smart contracts.

Another key feature of the Metaverse is its expansion of imagination through a unique and unparalleled experience, completely different from the routine-laden reality we live in. Metaverse technology broadens human horizons, allowing individuals to live a more realistic virtual experience.

The Metaverse is primarily composed of three elements: standards, interoperability, and presence. The sensation of being in a virtual place with other people is called presence. Research spanning decades has demonstrated that this feeling of embodiment improves the quality of interactions that occur online. Virtual reality headsets and other related technologies enable this presence.

The capacity to move between virtual worlds effortlessly while utilizing the same virtual assets—such as avatars and digital items—is referred to as interoperability. Avatars may be created with the Ready Player Me application, which creates 3D avatars for usage in the Metaverse and hundreds of other virtual environments, including Zoom meetings. Blockchain-based products like cryptocurrencies and non-fungible tokens (NFTs) make it easier to move digital items across virtual borders at the same time.

I. 1.2 Evaluating Metaverse Technology

Like any new technology amid the ongoing technological and digital advancements worldwide, the Metaverse has its benefits for its targeted audience. Conversely, it also has drawbacks and risks that impact various levels, including economic, social, technological, and legal. Therefore, we will address the advantages of Metaverse technology (A) and then highlight its main disadvantages (B).

I. 1.2.1 Advantages of Metaverse Technology

Metaverse technology provides a three-dimensional mechanism for interaction within a digital space, linking the real world with the virtual world. It allows users to navigate and perform various operations and transactions effortlessly and smoothly using various technical tools and means. In the field of higher education, university professors can enter the Metaverse to deliver lectures or explain various practical works using avatar technology that represents the professor. Students can join and attend the lectures or practical lessons (Ibrahim, 2022).

This technology also enables students to simulate all intangible ideas, factors, and theories or those characterized by some impossibility. For example, space and geology students can simulate the moon, sun, and various planets by entering artificial intelligence systems and programming these factors' characters. Consequently, they can "travel" to the moon, planets, and ocean depths. For history students, Metaverse technology allows them to return to historical periods and simulate living conditions of those times. Similarly, it applies to studies in the fields of medical sciences and aviation, among others (Nour Eddine, 2022).

In the workplace, Metaverse technology allows users to work without leaving their homes. Through virtual reality headsets, they can go to their offices and perform their duties alongside colleagues instead of interacting through video calls and applications like Zoom. Employees can join each other in a virtual office provided by the Metaverse.

In business and commerce, the Metaverse enables various commercial transactions, such as shopping, trading, selecting goods and services, and paying with cryptocurrencies or credit cards in a three-dimensional experience. It also allows establishing companies and financial and commercial institutions (Ben Halima, Barsa, & Ben Salem Ahmed, 2022). Additionally, Metaverse technology can be used in real estate trading to conduct virtual 3D tours of properties.

Notably, a new market for virtual real estate in the form of NFTs has emerged (Ben Halima, Barsa, & Ben Salem Ahmed, 2022).

For instance, the Decentraland platform has achieved sales of over $50 million, including virtual land, avatars, usernames, and wearable devices like virtual clothes. On April 11, 2021, a 41,216-square-meter virtual land was sold for $572,000.

Metaverse technology also allows users to attend concerts and watch movies and TV shows. For example, American rapper Travis Scott attracted an audience of 27.7 million visitors to five concerts within the online game Fortnite, owned by Epic Games (Ibrahim, 2022). Users can visit various virtual museums housing cultural heritage, arts, and artifacts and engage in favorite sports without leaving home. This technology provides and creates a unique experience, transcending the limitations of time and space (Nour Eddine, 2022).

Moreover, Metaverse technology can be utilized in psychological sciences, such as in psychotherapy, where virtual reality is used in many therapeutic protocols, especially in cases where interacting with the source of fears is challenging. It can also be relied upon to treat some psychological traumas like PTSD.

I. 1.2.2 Disadvantages of Metaverse Technology

Despite the advantages of Metaverse technology, which expand human horizons and help users experience virtual reality more realistically, its dark side presents unresolved drawbacks despite repeated attempts.

The most significant drawback is the ease of violating the privacy of Metaverse users. Individuals' data becomes accessible to everyone, whether they like it or not. Any user must provide their personal data and deposit it with the Metaverse platform, leading to potential privacy violations—one of the Metaverse's main risks.

Additionally, the ease of committing crimes in virtual reality is facilitated by Metaverse technology. Users can enter secretly and encrypted, and interactions occur through avatars. This facilitates committing various crimes, such as inciting suicide, violating religions, spreading hate speech and violence, fraud, rape, prostitution, or crimes against property like theft, forgery, and gambling (Jamila, 2022).

One of the most significant disadvantages is the ease of spreading false information, misleading data, and rapid rumor dissemination. The Metaverse technology plans and works on employing targeted advertisements within its platforms, raising further concerns.

A notable disadvantage of Metaverse technology is the phenomenon of isolation, which can harm individuals and societies in the real world. Individuals may live in their Metaverse world, forgetting their real world, using it as an escape from reality, and possibly as an alternative to suicide. Over time, they might struggle to interact with the real world. Moreover, addiction to this technology could have mental and physical consequences, such as electronic schizophrenia disorder, bipolar personality disorder, depression, anxiety, and various psychological diseases like nomophobia (fear of being without a mobile phone) (Nour Eddine, 2022). There is also the moral breakdown combined with excessive exposure to sex and pornography, potentially destroying the principles and ethics of future generations over time.

Virtual worlds manifested in entertainment games within the Metaverse significantly support and promote suicide. Due to the risks of these games, China imposed certain restrictions on Metaverse users, limiting the time allowed for online gaming. They also set age restrictions for those who can play these games, specifying the days they can play. Companies are prohibited from providing services except under specific conditions (Nour Eddine, 2022).

I. 2. Legal Issues of Crimes through the Metaverse: The Necessity of Legal Framework

Many legislations, particularly in the criminal field, find themselves compelled to develop their legal systems to keep pace with the complex outputs of this rapidly evolving technology, which leads to the swift creation of new centers and relationships that require regulation. The crimes committed in the virtual Metaverse world are constantly increasing due to their unique nature. Based on this, we will attempt to clarify the various legal issues of these crimes, starting with the crisis of the absence of legal texts (First), then moving to the problem of the incompatibility and inadequacy of traditional legal adaptation for Metaverse crimes (Second).

I. 2.1 Crisis of the Absence of Legal Texts

The developments in digital technology have led to the emergence of new fields where the law finds possibilities to impact life differently, in the form of legal regulation through legislative and regulatory texts to frame this technology. As agreed, in the criminal field, there is no punishment, crime, or security measures without a legal text, known as the principle of legality, which is one of the pillars of crime. The absence of legislative consideration for Metaverse technology creates a real crisis for judges when applying the law to the various legal issues arising from this technology.

Crimes committed in this world are similar in description to information or electronic crimes only in their broad sense. They involve any unlawful act or omission conducted using a technological tool or any device for the automatic processing of information, whether the device facilitated the crime, was the crime scene, or served as the environment for committing the crime in closed or open information networks.

Some behaviors and crimes committed in the virtual Metaverse world are extremely dangerous. Even if they fall under the general rules or specific provisions of information and communication technology laws, these do not achieve the appropriate criminal justice for such behaviors and crimes and the resulting severe damage (Ben Halima, Barsa, & Ben Salem Ahmed, 2022).

There are some crimes and behaviors to which criminal law (penalties) and complementary laws related to the technological environment can be applied. For example, in Algeria, the legislator has issued a vast array of laws regulating everything that intersects law and technology, whether in terms of organization, effects, or crimes arising from these transactions. Examples include Law No. 09-04 containing specific rules for preventing and combating crimes related to information and communication technologies, Law No. 15-04 establishing general rules related to electronic signatures and certification, and Law No. 18-07 dated June 10, 2018, concerning the protection of natural persons in the processing of personal data (Nour Eddine, 2022).

However, this application remains relatively problematic, as the process itself is not readily conceivable within the Algerian legal system and far from practical application. Some behaviors and crimes cannot be applied to existing legal rules due to their incompatibility and lack of harmony. Examples include crimes against persons, defamation, virtual rape, and more.

Notably, news platforms have reported an incident where an English woman was subjected to symbolic or virtual rape through Metaverse technology. The avatar representing her body was violated. Under general rules, rape is only considered if a man has full sexual contact with a woman without her valid consent. Therefore, there is no mention of rape due to the absence of its elements. Thus, legislative intervention is required to criminalize such behavior with specific provisions for the virtual world.

Similar issues arise with gambling crimes. Previously, gambling occurred at the same table with the participants present. Now, gambling happens in virtual casinos, which are web-based sites designed like casinos on the internet where all types of gambling occur, generating significant financial returns. For example, in the United States, revenue from online gambling increased from $3.1 billion in 2001 to $24 billion in 2010. American legislators attempted to pass a law banning online gambling.

In this context, Mark Zuckerberg, the American entrepreneur and programmer, founder and CEO of the social networking site "Facebook," highlighted behaviors and practices within the virtual world during his announcement of Metaverse technology and the extent to which they are subject to law, as well as the legal and ethical responsibility of Metaverse users (Ibrahim, 2022).

From the above, it becomes clear that the absence of legal texts regulating behaviors and actions in the virtual Metaverse world results in several consequences:

- There is no crime or punishment without a legal text, meaning that if there is no text criminalizing various actions and behaviors, the judge must acquit, and cannot fill the legislative gap resulting from massive technological and digital advancements.
- Measuring in criminal texts is prohibited, meaning judges cannot compare the components and facts of one crime with another that is legislated. Therefore, imposing a punishment not prescribed by law is impossible.
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I. 2.2 Incompatibility and Inadequacy of Traditional Legal Adaptation for Metaverse Crimes

It is well established in criminal law that crimes are only constituted when certain elements and components are present, collectively forming a punishable act. The virtual Metaverse world, being a three-dimensional virtual environment, is neither entirely real nor entirely fictional. It allows users to enter it with specific tools and use an animated avatar to engage in various activities like shopping, meeting people, gaming, and creating personal worlds. The material element of crimes committed in the Metaverse faces many challenges, whether related to the criminal act and behavior, the criminal result, or even the causal link between the result and the act. This necessitates legislative intervention to address this new type of crime in the virtual Metaverse environment (Ibrahim, 2022).

For example, it is inconceivable to imagine a murder crime in the Metaverse in the form and model defined by law. Murder requires a specific result, namely the killing of a living human being, with intent. Similarly, crimes of violence involve physical harm to real bodies, not avatars or symbols, and virtual rape of an avatar does not meet the legal definition of rape.

When legislators create legal rules, they primarily address natural or legal persons, meaning these laws cannot be directed at inanimate objects, animals, symbols, and the like. Some legislations have granted electronic legal personality to certain robots or so-called artificial humans, but these remain limited legal personalities. An example is Sophia, a robot created by Hanson Robotics, a company specializing in engineering and Hong Kong-based robotics company. On April 19, 2015, Sophia went live, and participated in numerous global conferences, including a conversation on October 11, 2017, with UN Deputy Secretary-General Amina Mohammed. Sophia has exceptional capabilities and was granted Saudi citizenship on October 25, 2017, becoming the first robot to receive citizenship. Similarly, Alexa, the intelligent assistant developed by Amazon, controls many smart devices used as a home automation system.

If a robot has a complete identity, the acquisition of funds and assets and the right to litigation can only be exercised through its representative, as well as the capacity for conduct and performance, as seen in the automation of contracts based on pre-programmed code without human review or any other intervention (Ibrahim, 2022).

Since Metaverse technology represents a virtual environment that disregards time and space, merging the real and virtual worlds through the embodiment of virtual characters known as avatars to conduct digital purposes, it transcends the factors of time and space. These factors are crucial in applying criminal law and their significant consequences. It becomes evident that crimes committed in the virtual Metaverse world do not acknowledge geographical or spatial boundaries of states. By its nature, the virtual world operates in limitless and undefined spaces, serving as a stage for

committing crimes via Metaverse technology, akin to the concept of transnational crimes. The act may be committed in one country, and the result in another (Ibrahim, 2022).

Crimes committed in the Metaverse constitute a new concept, leading to the inadequacy of traditional criminal legal adaptation to address crimes in the virtual Metaverse world. It does not recognize the factors of time and space, which are principles for applying criminal law, and the resulting principles of non-retroactivity, the most favorable law for the accused, and the principles of territoriality, nationality, and universality.

II- Results

- The Metaverse, also referred to as the "post-reality world," is a network of linked devices that combines virtual and real-world surroundings with ongoing, multi-user interactions. It uses augmented reality (AR) and virtual reality (VR) and features open-world gameplay. Avatars serve as user representations, enabling real-time communication and creating an immersive environment.
- Metaverse technology allows individuals to establish and create a virtual life across different internet spaces. It offers opportunities for meeting, working, learning, trading, and entertaining. This experience goes beyond mere observation, enabling users to engage with the virtual world in a three-dimensional form through various smart tools and technologies.
- Despite the advantages of Metaverse technology, which expand human horizons and help users experience virtual reality more realistically, its dark side presents unresolved drawbacks despite repeated attempts.
- Many legislations, especially in the criminal field, find themselves compelled to develop their legal systems to keep pace with the complex outputs of this rapidly evolving technology. Crimes committed in the virtual Metaverse world are constantly increasing due to their unique nature.

III- Conclusion

The world today is undoubtedly experiencing a rapidly accelerating revolution in the field of communication and information technology, commonly referred to as the Digital Revolution. This revolution results from the continuous and significant advancements in communication and digital technologies, opening the door to substantial and fundamental transformations in the global economy and commerce. It can be described as the pivotal point from which the significant developments we witness today in all fields have emerged. One of the most important outcomes has been artificial intelligence technologies, culminating in what is known as the Metaverse. This technology has led to profound transformations, suggesting instability in human life across social, economic, and legal levels.

Recommendations

If the technological climate destabilizes the law and disrupts conservative legal minds, it is undeniably an effective factor in the advancement of the law. Discussing the inadequacies of existing legal provisions encourages the practice of critical and analytical thinking. Therefore, we propose the following:

- The necessity of enacting specific legislation to regulate Metaverse technology, balancing economic and programming perspectives.
- The necessity of international legislative cooperation to address the risks of Metaverse technology.
- Holding conferences and scientific seminars for specialists, benefiting students, researchers, university professors, and the general public to clarify the various legal and economic aspects of this technology, highlighting its components and limits, and explaining its risks to the social environment.

In the spirit of scientific integrity, we cannot deny the benefits we have gained from those who preceded us in studying this field, especially (Ibrahim, 2022). This work is but a modest effort governed by the human nature, which is not free from error and imperfection.

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