The Metaverse has come under increasing media spotlight since October 2021, when Facebook rebranded itself as Meta. As part of its rebranding, Meta announced its plan to build the Metaverse—a new version of the Internet, where people can connect, work, play, and enjoy other activities, such as teleporting to ancient Rome. The announcement sparked explosive interest in the Metaverse.

This article defines the Metaverse as the immersive Internet, where users are within three-dimensional online environment, using headsets or other equipment. Users need special digital agents (avatars) to represent them in the Metaverse. The article sheds light on some challenges that the Metaverse may raise for copyright law. One of the issues is whether the existing copyright framework may be applied to the Metaverse, or new rules may be necessary. The author argues that despite merging various technologies, the Metaverse should not require fundamental changes to copyright law. The existing copyright rules may regulate copyright issues on the Metaverse, at least on the initial stage of its development.
# If the Metaverse is Built, Will Copyright Challenges come?

**Levan Nanobashvili**

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I. INTRODUCTION

The Metaverse. This word has come under increasing media spotlight since October 2021, when Facebook rebranded itself as Meta. As part of its rebranding, Meta announced its plan to build the Metaverse – a new version of the Internet, where people can connect, work, play, and enjoy other activities, such as teleporting to ancient Rome. The announcement sparked explosive interest in the Metaverse, with many companies announcing their plans to invest in the new technology. Several months after the announcement, the attention to the Metaverse has started to fade. However, virtual Rome cannot be built in a day, and, according to some predictions, creation of the full scale Metaverse may take years, if not decades.

What is the Metaverse? Is it a novel concept? Or is it the second life of already existing Internet platforms, such as, online game “Second Life”? Is the Metaverse rebranded Virtual Reality (“VR”)? Perhaps the Metaverse is like a mythological Phoenix, born from the ashes of its predecessor online platforms, destined to live for a brief period, and to perish again.

It seems that there are as many definitions of the Metaverse as there are people discussing it. Some believe that the Metaverse already exists, in the form of online games and other Internet platforms. Others argue that the Metaverse is the
future of the Internet which may materialize after five, ten, or fifteen years. Through this article, I aim to add some clarity to the definition of the Metaverse and its copyright issues, without causing additional confusion. With this challenging meta-promise in mind, I will continue by discussing my understanding of the mysterious Metaverse and shedding light on various challenges that the Metaverse may raise for the area of copyright law.

Ultimately, everything genius is simple. The Metaverse is about how people experience the Internet. The Metaverse can be best described as the immersive Internet, where users are within a three-dimensional online environment, using headsets or other equipment. Current Internet experience is mostly two-dimensional, limited to screens of computers and mobile phone. As the Metaverse experience is immersive, users need special digital agents, or avatars, to represent them. This article will proceed based upon this understanding of the Metaverse.

“Everything you can imagine is real.” These words are often attributed to Pablo Picasso. Maybe he was a dreamer, but he was not the only one. Neil Stephenson was also a dreamer who imagined the Metaverse in his dystopian science fiction novel *Snow Crash*, 1992. In the Stephenson’s Metaverse people use digital avatars of themselves to interact in the online environment:

So, Hiro’s is not actually here at all. He’s in a computer-generated universe that his computer is drawing onto his googles and pumping into his earphones. In the lingvo, this imaginary place is known as the Metaverse. [...] Hiro is approaching the Street. It is the Broadway, the Champs Elysees of the Metaverse. It is the brilliantly lit boulevard that

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11 Id.

12 NEIL STEPHENSON, *SNOW CRASH* 20 (2000). In this Article, the “Metaverse” is used with a capital “M,” for at least three reasons. First, by analogy with the “Internet” which is also used with a capital letter. Second, Neil Stephenson used “Metaverse” with a capital letter. And third, many authors use the capital “M” as well. Id.; see also VERNOT VINGE, TRUE NAMES (1981). Some argue that Stephenson’s vision goes back to Vinge’s series of William Gibson novels from the ’80s. Id.; see also MORTON HEILIG, SENSORAMA (1962). Both authors owe a debt to Heilig’s work. Id.; see also Ethan Zuckerman, *Hey Facebook, I made a Metaverse 27 Years Ago*, THE ATLANTIC (Oct. 29, 2021), https://www.theatlantic.com/technology/archive/2021/10/facebook-metaverse-was-always-terrible/620546/ . Even prior to that, in 1935, the science fiction writer Stanley G. Weinbaum authored a short story “Pygmalion’s Spectacles,” describing a pair of googles which allowed one to perceive a movie and experience its sight, sound, taste, smell, and touch. Id.; see also Stephen Johnson, *See The Future, Immersive Technology will Revolutionize Everything From Theme Parks to Daily Life*, BIG THINK (July 22, 2021), https://bigthink.com/the-future/immersive-technology/#:~:text=July%22%2C%202021%, Immersive%20technology%20will%20revolutionize%20everything%20from%20theme%20parks%20to%20daily%2C%20will%20change%20our%20lives%20forever.
can be seen, miniaturized and backward, reflected in the lenses of his goggles. It does not really exist. But right now, millions of people are walking up and down it.\textsuperscript{13}

Many attempts have been made to create a Snow Crash-type digital world.\textsuperscript{14} However, for many years, technologies were not available for the full realization of Stephenson’s vision.\textsuperscript{15} Various online games exist, but, according to some, none of them are close to the complexity and realism of the Metaverse described in Snow Crash.\textsuperscript{16}

Various technologies have come together to make a full scale Metaverse possible. Augmented reality ("AR") and VR headsets are available with more power, more comfort, and at cheaper price.\textsuperscript{17} Blockchain supports digital currencies and non-fungible tokens (NFTs).\textsuperscript{18} New democratic ownership economy is possible where token-holders have voting rights and can participate in platform’s governance.\textsuperscript{19} The foundation of the Metaverse seems to be developing faster than the Internet, which became mainstream in 1990s.\textsuperscript{20}

Technology is not the only reason behind the explosive interest in the Metaverse. The Covid-19 pandemic accelerated and deepened this digital transformation that has been steadily ongoing for years.\textsuperscript{21} Due to the pandemic, commerce, work, health, education, government services, court hearings, social interactions, and many other activities have fully moved to or have become more dependent upon the Internet.\textsuperscript{22} The pandemic has revealed the full potential of the

\textsuperscript{13} NEIL STEPHENSON, SNOW CRASH 20 (2000).
\textsuperscript{14} See Cory Ondrejka, Escaping the Gilded Cage: User Created Content and Building the Metaverse, 49 N.Y.L. SCH. L. REV. 81, 82 (2004).
\textsuperscript{15} Id.
\textsuperscript{16} Id. at 83.
Internet, and most changes are already implemented and irreversible. It is unlikely that society, businesses, or governments will fully return to their “pre-Covid” status.

Bloomberg estimates that the Metaverse may become an $800 billion USD market opportunity by 2024. After this estimate, it is not surprising that companies from around the globe have announced plans for entering the Metaverse; these companies include Walmart, Verizon, Gap, Nike, Hulu, Adidas, Atari, and others. J.P. Morgan, a U.S. bank, is the first lender to arrive in the Metaverse, having opened a virtual lounge named “Onyx lounge” in Decentraland, a virtual world based on blockchain. Accounting firm PricewaterhouseCoopers revealed that its Hong Kong unit acquired virtual real estate in the Sandbox (a virtual space where players can play, build, own, and monetize their virtual experiences). Heineken presented its “digital beer” in the Decentraland. The beer cannot be tasted, but, according to Heineken, the digital beverage still fulfills its main task by “bringing people together in one place.”

The idea of the Metaverse has been widely criticized, with some even comparing it to communist propaganda, which promised to build a bright and idealized future, and never materialized. According to another opinion, the Metaverse may be

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24 James R. Bailey & Scheherazade Rehman, How to Overcome Return-to-Office Resistance, HARV. BUS. REV. (Feb. 14, 2022), https://hbr.org/2022/02/how-to-overcome-return-to-office-resistance. Many employees do not like the idea of returning to office after working remotely during the Covid-19 pandemic; some of these employees even prefer to resign. Id.

25 Bloomberg Intelligence, Metaverse may be $800 billion market, next tech platform, BLOOMBERG PRO’L SERVS. (Dec 1, 2021), https://www.bloomberg.com/professional/blog/metaverse-may-be-800-billion-market-next-tech-platform/; see also Investing News Network, U.S. Consumer Video Game Spending Totaled $60.4 Billion in 2021, INVESTING NEWS (Jan. 18, 2022), https://investingnews.com/us-consumer-video-game-spending-totaled-60-4-billion-in-2021/ The “overall consumer spending on video games,” only in the U.S., “totaled USD 60.4 billion in 2021, an 8% increase over 2020.” Id.

26 Onyx by J.P.Morgan, supra note 19, at 2; see also Jessica Golden, Nike is quietly preparing for the metaverse, CNBC (Nov. 2, 2021), https://www.cnbc.com/2021/11/02/nike-is-quietly-preparing-for-the-metaverse.html; Stefania Stimolo, Nikeland: nearly 7 million people in the metaverse store, THE CRYPTO NOMIST (Mar. 23, 2022), https://en.cryptonomist.ch/2022/03/23/nikeland-nearly-7-million-people-shop-metaverse/. Nike indicated that it intends to sell virtual branded sneakers and apparel in the Metaverse and filed several trademark applications; according to Nike, almost seven million people visited Nike’s shop in the Metaverse within five months from opening. Id.


30 Id.

“opium for the masses.”32 Elon Musk, CEO of Tesla, is also skeptical about the future of the Metaverse.33 Musk proposes his alternative: a chip developed by Neuralink, a company owned by Musk.34 This chip would be surgically implanted into users’ brains taking users into a virtual reality.35 After Musk’s proposal, the Internet-version Metaverse does not seem like a bad idea.

A question about the Metaverse is whether the existing copyright rules may be applied to this new technology. An alternate question is whether the Metaverse is so unique that the novel copyright regulation may be necessary. This article focuses solely on copyright law, even though the Metaverse may raise new challenges for various legal fields—particularly problems related to privacy of users and access to their behavioral data.36

In this article, I argue that despite merging various technologies, the Metaverse should not require fundamental changes to copyright law. Existing copyright rules may regulate copyright issues within the Metaverse, at least in the initial stages of its development.

The Metaverse merges various technologies such as VR, AR, Artificial Intelligence (“AI”), blockchain, cryptocurrencies, NFTs, decentralized architecture, and others.37 Looking to the variety and complexity of these technologies, the Metaverse appears intricate and challenging. Such complexity may be confusing and raise doubts about the possibility of regulating the Metaverse through existing copyright framework. However, instead of looking at Metaverse technologies, we can focus on the digital content which users may experience in the Metaverse. Such content may include mainly images, videos, text, and audio materials.38 Copyright law has successfully regulated rights on such content for decades.39 Because of this, such content will not be different from the content which currently exists on various Internet platforms and online games. This article does not claim that the Metaverse is the greatest challenge yet to copyright law. On the contrary, this article expresses strong faith in copyright law and its ability to survive the Metaverse challenge. What does not kill copyright law makes it stronger.

In this article, I will first discuss the definition of the Metaverse and its centralized or decentralized architecture. Next, this article will focus on the relationship between VR technology and the Metaverse, as well as opportunities and challenges associated with the Metaverse. Thirdly, this article will discuss the

33 Tangermann, supra note 31.
35 Id.
anticipated copyright challenges associated with the Metaverse, focusing on use of previously licensed copyrighted content on the Metaverse. Finally, this article will describe copyright issues related to the use of AI, development of software, and the use of blockchain technology on the Metaverse.

II. DISCUSSION

A. The Metaverse

This part of the article starts with the definition of the Metaverse, which is a difficult task as it does not yet fully exist. Thereafter, the article analyses possible centralized or decentralized architecture of the Metaverse. Subsequently, the article compares VR and the Metaverse. This section continues by discussing opportunities and challenges of the Metaverse. Finally, the article analyzes some anticipated copyright problems associated with the Metaverse.

1. Definition of the Metaverse: Will I Know It When I See It?

Describing the Metaverse in 2022 is like explaining the Internet in 1960s. The comprehensive definition does not exist, like the Metaverse itself. In fact, everyone who talks about the Metaverse offers their own vision and interpretation of what it is. This article is no exception.

The term “Metaverse” is a portmanteau of two words: “meta” and “universe.” “Meta” (μετά) is a Greek word meaning “after,” or “beyond.” This word is often used in the scientific nomenclature as a prefix for names of certain disciplines, for example, metaphysics, metacriticism, and metafiction. “Meta” also denotes transformation or a change, as used in metamorphosis. Alternatively, “Metaverse” may mean “Meta’s universe,” i.e., the universe owned by Meta. If we focus only on the pronunciation, “meta” sounds remarkably close to the Hebrew word for “dead.” My sincere condolences, Meta.

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43 Id.
45 See Zuckerman, supra note 12.
Existing definitions of the Metaverse can be divided into two main groups. The first one suggests that the Metaverse is the future of the Internet, which may materialize in five or more years.\(^\text{47}\) This view is shared by Mark Zuckerberg, who believes that "[t]he best way to understand the Metaverse is to experience it yourself, but it is a little tough because it does not fully exist yet."\(^\text{48}\) According to the second approach, the Metaverse technology already exists, in the form of various online games and Internet platforms based upon VR technology.\(^\text{49}\)

It is true that some immersive online platforms and virtual games already exist; however, it may be questioned as to whether they are real Metaverse.\(^\text{50}\) Most of our online platforms and virtual games are “cartoonish,” and user experience is awkward.\(^\text{51}\) For example, users’ avatars are often legless.\(^\text{52}\) Legs are coming but they are lagging.\(^\text{53}\)

Why do we need the term “Metaverse” and why do we not just use the term the “Internet” instead—especially if the Metaverse is viewed as the future of the Internet? According to Matthew Ball, “[u]sing the [M]etaverse as a distinctive descriptor allows us to understand the enormity of that change and in turn, the opportunity for disruption.”\(^\text{54}\) While the Metaverse may cause important changes, it seems that the new term has many advantages related to other aspects of this new technology. First of all, the Metaverse may allow Meta to shake off negative public opinion associated with its social media platform, Facebook.\(^\text{55}\) Moreover, as Joan Donovan suggests, “[a]s long as you can make technology seem fresh and new and cool, you can avoid regulation. And you can run defense on that for several years before the government can catch up.”\(^\text{56}\) Regardless of any specific reason, it seems that the term Metaverse has already established itself and it is here to stay.

The Metaverse is sometimes described as the “natural evolution of Web 3.0.”\(^\text{57}\) In order to explain this view, Internet history may be divided into three phases, with each developing gradually and without well-defined borders. The original Web 1.0 was based upon a client-server model where users only passively consumed read-only

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\(^\text{47}\) Ghlionn & Hamilton, supra note 7.

\(^\text{48}\) Meta, supra note 2 (see minute 03:18 through minute 03:23).


\(^\text{50}\) Id. Such games are, for example, “Axie Infinity,” “Decentraland,” “Sandbox,” and “Alien Worlds.”

\(^\text{51}\) Ghaffary, supra note 32.

\(^\text{52}\) Id.

\(^\text{53}\) See Wall St. J., Trapped in the Metaverse: Here’s What 24 Hours in VR Feels Like, YOUTUBE (Nov. 12, 2021), https://www.youtube.com/watch?v=rlrLTZUaMSDQ&t (see minute 5:36 through minute 5:49).


\(^\text{55}\) Id.


content. In Web 2.0, which is currently dominant, users interact with each other, create, and share Internet content. However, corporations, such as Meta, Google, Microsoft and others, own such content and extract monetary value from it. Users do not benefit from content which they created or personal information they shared with such corporations. Lastly, Web 3.0 is viewed as the future of the Internet, with users being both producers of content and beneficiaries of it. Moreover, Web 3.0 promises “decentralization” and “disintermediation” (i.e., disappearance of intermediaries which facilitate the Internet communication on the current Web 2.0). As a result, users should be able to own their content and control the flow of information on Web 3.0. As Internet entrepreneur Jason Calacanis predicted in 2007, Web 3.0 would be “a return to what was great about media and technology before Web 2.0: recognizing talent and expertise, the ownership of one’s words, and fairness.”

Is the Metaverse really Web 3.0? If not, what is the difference between the two? The prevailing view is that the two concepts are different. Firstly, Web 3.0 focuses more on who owns and controls the Internet content. However, the Metaverse focuses on how users experience the Internet. The Metaverse can be defined as the immersive environment, where users not only see three-dimensional virtual world, but they are in that environment, represented by their avatars. Secondly, the Metaverse may be either centralized or decentralized, as discussed in more detail in the subsequent part of this article. However, Web 3.0 is viewed as decentralized and based upon blockchain, granting users control over their data.

The Metaverse promises to blur the line between the real world and virtual reality. However, can a human brain be tricked into believing that the virtual world is real? According to some arguments, it can be. Such possibility was illustrated by a

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58 See Nupur Choudhury, World Wide Web and Its Journey from Web 1.0 to Web 4.0, 5 INT’L J. COMP. SCI. INF. TECH. 6 8090, 8096-8100 (2014).
60 Kurt Ivy, From Web 2.0 to Web 3.0: How These Entrepreneurs Made the Switch, ENTREPRENEUR (June 8, 2022), https://www.entrepreneur.com/article/42701.
62 Tonya M. Evans, Cryptokitties, Cryptography, and Copyright, 47 AIPLA Q. J. 219, 231 (2019); see also George Bouchagiar, Privacy and Web 3.0: Implementing Trust and Learning from Social Networks, 10 REV. EUR. STUD. 16, 19 (2018).
63 Id.
66 Id.
67 Wolfson, supra note 9.
69 Id.
70 See Lemley & Volokh, supra note 17, at 1136. According to cognitive research, users of VR often act in the same way as in the real world. Id. See also Gilad Yadin, Virtual Reality Exceptionalism, 20 VAND. J. ENT. & TECH. L. 839, 842 (2018).
so called “rubber hand illusion.” Researchers asked a person to sit down at a table with a rubber hand where a person’s real hand would be. Researchers simultaneously touched the rubber hand and a person’s real hand, tricking the brain into thinking the signal came from the rubber hand. As a result, the human brain established connection with the rubber hand. The researchers struck the rubber hand with a knife, causing stress for the person. This experiment proves that the human brain is not perfect and can sometimes confuse reality with an illusion. As a result, the brain can view the Metaverse experience as a real-life event. Moreover, the harassment and other improper behavior directed at users’ avatars on the Metaverse may cause the same real-life stress.

The Metaverse will require special hardware such as a headset, a pair of goggles, a head-mounted device, a haptic suit, tactile-sensing gloves, smartwatches, servers for storage of big data, and other equipment which does not fully exist yet. The Metaverse will also require high speed Internet to allow for uninterrupted transfers of big data. Some of this hardware already exists, but some is in the process of development.

In 2014, Facebook bought Oculus, a producer of headsets for gamers for $2 billion, and started working on the improvement of headset technology. According to

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71 See Heller, supra note 36, at 21-2. This experiment was conducted for medical purposes about twenty-five years ago and it had nothing to do with the Internet or the Metaverse. *Id.*


73 *Id.*

74 *Id.*

75 *Id.*

76 *Id.*


80 See David Chen, *The Metaverse is Here...But is the Hardware Ready?*, SPICE WORKS (Mar. 14, 2022), https://www.spiceworks.com/tech/hardware/guest-article/the-metaverse-is-here-but-is-the-hardware-ready; see also Adam Clark, *Facebook’s freaky new glove: Reality Labs is working on clothing that helps you feel things in the metaverse*, VOX (Nov. 17, 2021), https://www.vox.com/recode/2021/11/17/22787191/facebook-meta-haptic-glove-metaverse.


Wall Street Journal conducted an experiment where a reporter used a headset to attend virtual meetings, online shows, and meet friends’ avatars.\footnote{Wall St. J., supra note 53.} After spending the entire day wearing the headset, the reporter had a headache and eye pain.\footnote{Id.} According to one prediction, within a decade or more, the Metaverse equipment will be more comfortable and “virtual reality headsets will eventually shrink to the size of a pair of glasses.”\footnote{Steven Tweedie, \textit{Oculus CEO: Virtual Reality Headsets Will Eventually Shrink To A ‘Set Of Sunglasses’}, BUSINESS INSIDER (Sept. 12, 2014), https://www.businessinsider.com.au/interview-with-oculus-ceo-brendan-iribe-2014-9.}

Interaction in the Metaverse will require a 3-D avatar.\footnote{Id.} In general, avatars are a “virtual representation of the user, or of the user’s alter ego or character, in the virtual world or the game.”\footnote{Stephenson, supra note 13, at 20. Neil Stephenson popularized the term “avatar” in his 2000 novel, \textit{Snow Crash}. \textit{Id.}} Avatars may vary from a giant cat in a dress, to a medieval knight, to a cactus.\footnote{Tyler T. Ochoa, \textit{Who Owns an Avatar?: Copyright, Creativity, and Virtual Worlds}, 14 \textit{VAND. J. ENT. & TECH.} 959, 961 (2012).} If we paraphrase one famous Internet-meme, on the Metaverse, nobody knows you are a dog, because the dog may have a human avatar.\footnote{See Parmy Olson, \textit{It's Awkward Being a Woman in the Metaverse}, BLOOMBERG OPINION (Dec. 15, 2021), https://www.bloomberg.com/opinion/articles/2021-12-15/the-metaverse-via-oculus-is-awkward-if-you-re-a-woman-and-beware-of-griefers?srref=YH1lo0rL.}

One interesting example of an avatar is Wade Watts’ avatar from the science fiction novel \textit{Ready Player One}:

I’d designed my avatar’s face and body to look, more or less, like my own. My avatar had a slightly smaller nose than me, and he was taller. And thinner. And more muscular. And he didn’t have any teenage acne. But aside from these minor details, we looked more or less identical. The school’s strictly enforced dress code required that all student avatars be human, and of the same gender and age as the student. No
giant two-headed hermaphrodite demon unicorn avatars were allowed. Not on school grounds, anyway.\footnote{Ernest Cline, Ready Player One 28 (2011) (noting that the creation of an avatar which looks like a famous fictional character may raise copyright law concerns). See also Lemley and Volokh, supra note 17, at 1070. Avatars will need a name. Id. The following except from Ready Player One may illustrate the potential problems which may arise regarding avatar’s names,}

Avatars may raise issues of copyright ownership. Currently, most online game providers require players to agree on the provider’s ownership of all copyrightable expression created during the game, and this requirement automatically applies to avatars.\footnote{Ochoa, supra note 87, at 961, 964. There is a view applicable to online role-playing games that each avatar should be considered a joint work between the game provider and the user, as well as a contribution to a collective work (the game as a whole). Id. See also Meta, Oculus Terms of Service, Facebook (April 11, 2022), https://store.facebook.com/legal/quest/terms. “By submitting User Content through the Oculus Products, you grant us a worldwide, non-exclusive, transferable, royalty-free, and fully sublicensable (i.e. we can grant this right to others) right to use, copy, display, store, adapt, publicly perform, and distribute such User Content in connection with the Facebook Company Products [...]” Id.} Such an approach may not work well in the Metaverse, considering possible interoperability between different Metaverse platforms and users’ desire to freely move their avatars between platforms. Some websites already allow the creation of cross-platform avatars for various applications and games.\footnote{See Ready Player Me, https://readyplayer.me/ (last visited May 30, 2022).} However, some believe that having a single Metaverse avatar may be impossible, as each Meta-platform may create and run its own identity system.\footnote{Matthew Ball, The Metaverse: What it is, Where to Find it, and Who Will Build it, MatthewBall.vc (Jan. 13, 2020), https://www.matthewball.vc/all/themetaverse.} This prediction is supported by the existing model of Internet accounts, none of which encapsulate the entire Internet.\footnote{Id.} Even though one avatar varying Metaverse platforms may be convenient, such technology may require a lot of effort from platform developers. Without clear benefits, developers may not be willing to invest in the “free movement of avatars.”\footnote{Adi Robertson & Jay Peters, What Is The Metaverse, And Do I Have To Care?, The Verge (Oct. 4, 2021), https://www.theverge.com/22701104/metaverse-explained-fortnite-robx-roblox-facebook-horizon.}

Currently, it is unclear whether the Metaverse can have only one operator, such as the “Oasis” Metaverse in Ready Player One, or several operators.\footnote{Ball, supra note 93.} A single operator is unlikely as various companies are already involved in the Metaverse rush.\footnote{XRToday, Who is Building the Metaverse? A Group of 160+ Companies, and You, XRToday (Dec. 7, 2021), https://www.xrtoday.com/virtual-reality/who-is-building-the-metaverse-a-group-of-160-companies-and-you/} It is likely that we will see many companies exercising various degrees of control over
the distinct parts of the Metaverse.\footnote{Jessica Goodfellow, Who will control the metaverse?, CAMPBAIN US (Nov. 2, 2021), https://www.campaignlive.com/article/who-will-control-metaverse/1732106.} Alternatively, certain parts of the Metaverse may be decentralized, with users having control and voting rights.\footnote{Justin Sun, Why the future of the metaverse can only be decentralized, DATADECISIONMAKERS (Mar. 5, 2022), https://venturebeat.com/2022/03/05/why-the-future-of-the-metaverse-can-only-be-decentralized/.
}

The important part of the Metaverse will be software, which will generate online environments, create visual effects, and control other aspects of the virtual experience.\footnote{Sam Reynolds, Tech Giants Create Metaverse Standards Forum for Software and Terminology Standards Meta, Microsoft, Noudia, Unity, Sony, and 30 other companies are coming together to build the infrastructure for an interoperable metaverse, COINDesk (June 22, 2022), https://www.coindesk.com/tech/2022/06/22/tech-giants-create-metaverse-standards-forum-for-software-and-terminology-standards/.
} Control over software means control over the Metaverse. Such software may be quite complex, involving computer-generated environments and AI.\footnote{Carlos Melendez, The Metaverse: Driven By AI, Along With The Old Fashioned Kind Of Intelligence, FORBES (April 18, 2022), https://www.forbes.com/sites/forbestechcouncil/2022/04/18/the-metaverse-driven-by-ai-along-with-the-old-fashioned-kind-of-intelligence/?sh=6f4dd7c61b36.
}

Many things may happen in the Metaverse in real time.\footnote{Ball supra note 37.
} Currently existing Web 2.0 technology allows for real time communication, such as chatting between users or responding to new content.\footnote{See History Computer Staff, Web 2.0 Explained: Everything You Need To Know, HC (May 2, 2022), https://history-computer.com/web-2-0/.
} Concurrently, a substantial part of Internet content is stored on servers, and a user can access such content from a place and time chosen by the user.\footnote{See generally WIPO COPYRIGHT TREATY, art. 8, Dec. 20, 1996, 2186 U.N.T.S. 121. This treaty has been in force for the US since March 06, 2002. Id.
} For example, Internet users can watch a video uploaded on YouTube from almost any place where the Internet is accessible.\footnote{See Shubham Attri, List Of Countries That Have Banned YouTube For Its Citizens, DEASILEX (Nov. 9, 2022), https://deasilex.com/countries-that-have-banned-youtube/. YouTube is accessible almost at any place on the planet where the Internet is available. However, some countries have blocked it on their territories. Id.
} In addition to real-time experience, the Metaverse may allow access to stored content as well.\footnote{See Gregor Zaveer & Nicole Buckler, Decentralized Storage: Why Metaverse-Builders Can't Ignore It, BE[IN]CRYPTO (Feb. 9, 2022), https://beincrypto.com/decentralized-storage-why-metaverse-builders-cant-ignore-it/.
}

The Metaverse content will probably be created both by big corporations and users. According to some views on the Metaverse “[users] must be able to create truly new objects, to add value and innovate during the process of creation, and the market must be allowed to determine which creations have real value.”\footnote{Ondrejka, supra note 14, at 90.
} Moreover, the Metaverse “will be so enormous that only distributed approaches to creation have any hope of generating its content, thus users must build the world they live in.”\footnote{Id. at 101.
} Finally, users will be more engaged if they are allowed to create the Metaverse content.\footnote{Gene Park, Epic Games believes the Internet is broken. This is their blueprint to fix it., THE WASHINGTON POST (Sept. 28, 2021), https://www.washingtonpost.com/video-games/2021/09/28/epic-fortnite-metaverse-facebook/.
}
Currently, online games, such as Minecraft, Roblox, Fortnite, and Second Life, exist. In these games, players may join or leave any time, and their game progress is saved and shared with other players. These online games are often viewed as parts of the Metaverse or the Metaverse itself. While games may exist on the Metaverse, they will not be the whole Metaverse. In addition to being an important gaming platform, the Metaverse will support activities such as work, travel, shopping, learning, and more.

Raphael Koster, a game designer, developed a taxonomy which may be helpful in distinguishing online worlds from the Metaverse. According to this taxonomy, “[o]nline worlds lead to multiverses which lead to metaverses. And just about no one has actual metaverses to offer right now.” Koster views the Metaverse as “a multiverse which interoperates more with the real world. In most conceptions, it includes significant elements of augmented reality – such as walking around a real city and seeing virtual things. It includes shopping at actual stores via VR interfaces.”

The Metaverse would be intentionally designed to look, sound, and feel like the real world. According to some predictions, the Metaverse will mix digital content with the real world, allowing people to walk in a virtual London or New York City. If achieved, it may challenge the perception of the real, and “blur the cognitive line between imagery and physical presence,” as Lemley & Volokh stated regarding VR technology. Even though this statement was made about VR, it can be applied to the Metaverse.

The Metaverse will be a shared environment and may be experienced simultaneously by unlimited users who will have the sense of an individual presence. This aspect of the Metaverse was envisioned by Stephenson when he described his vision of the Metaverse: “[the Street in the Metaverse] does not really exist...”

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112 Ball, supra note 37.
113 See Raph Koster, Online world or metaverse?, RAPHAEL KOSTER’S WEBSITE (Sept. 2, 2021), https://www.raphkoster.com/2021/09/02/online-world-or-metaverse/. According to Raphael Koster’s taxonomy, “[i]n a real multiverse, there are multiple different [online] worlds connected in a network, which do not have a shared theme or ruleset. This lets you hop between very different worlds, with completely different types of experiences.” Id.
114 Id.
115 Id.
116 See Lemley & Volokh, supra note 17, at 1136.
117 See Pryor & Sessa, supra note 78, at 5.
118 See Lemley & Volokh, supra note 17, at 1136. According to cognitive research, users of VR often act in the same way as in the real world. Id.; see also Yadin, supra note 70, at 842.
119 Stephenson, supra note 13, at 20.
exist. But right now, millions of people are walking up and down it.” Due to this, the Metaverse may become a place for virtual concerts and other mass events. Currently, various companies are developing technologies allowing virtual graduations, weddings, celebrations, and other mass events. In the Metaverse, there will be no limitation of the number of viewers and no necessity to travel to an event location. Even the largest arenas in the world cannot accommodate audiences present at Metaverse events. For example, Lil Nas X, Travis Scott, and Ariana Grande held online concerts on Internet game platforms attended by millions of people around the globe.

The Metaverse idea has been criticized and even viewed as the biggest disruption of our life. Skeptics argue that virtual worlds have existed for years; however, most of them have been unsuccessful. According to Dr. Thomas Furness, such “[technology] is just like the atom splitting. It can be used for helping mankind, lifting mankind, or it can be used for destroying mankind.” According to Ethan Zuckerman, “Facebook’s promised metaverse is about distracting us from the world it’s helped break.” The Metaverse should not and cannot be a solution to problems of the humanity or a place where we can hide from real life problems. We should also be mindful of the fact that most science fiction novels and Hollywood movies describe the Metaverse as a dystopian reality.

2. Centralized or Decentralized, That Is the Question

This section discusses the possible centralized or decentralized nature of the Metaverse. Both options are possible, and time will show which model of the Metaverse prevails. Alternatively, the Metaverse may combine both models.

121 Stephenson, supra note 13, at 20.
123 Onyx by J.P. Morgan, supra note 19, at 9.
124 Pryor & Sessa, supra note 78, at 22.
125 Arda Ocal, Billboard: Travis Scott’s Astronomical drew more than 45 million viewers, ESPN (July 24, 2020), https://www.espn.co.uk/esports/story/_/id/29532117/billboard-travis-scott-astronomical-drew-more-45-million-viewers; see also Ara, et al., supra note 40.
127 Id.
128 See Heller, supra note 36, at 3 (noting that Dr. Thomas Furness is regarded as one of the first developers of immersive technologies).
129 See Zuckerman, supra note 12. Ethan Zuckerman is a professor and the director of the Initiative for Digital Infrastructure at the University of Massachusetts. Id.; see also Victor Tangermann, Facebook Shows Off Gloves That Allow You to “Feel” VR Objects, FUTURISM (Nov. 17, 2021), https://www.theatlantic.com/technology/archive/2021/10/facebook-metaverse-was-always-terrible/620546/.” Perhaps Zuckerberg is showing off fun tech to replace reality because Facebook’s current reality is looking pretty grim.” Id.
130 See Stephenson supra note 13, at 20; see also Cline, supra note 90.
The Metaverse may be decentralized and, hence, lack any governing authority. Such a path resembles the early history of the Internet when some of the Internet’s pioneers believed it had to be free from any intermediaries and control. In 1992, Timothy C. May wrote in “The Crypto Anarchist Manifesto” that computer technology could allow “individuals and groups to communicate and interact with each other in a totally anonymous manner.” May believed that technologies such as “public-key encryption, zero-knowledge interactive proof systems, and various software protocols for interaction, authentication, and verification” would fundamentally change the nature of governments, society, and corporations, as well as intellectual property.

A history showed that on the Internet, users could not interact without the help of one or more intermediaries. Currently, “[a] significant distinguishing feature of the Internet is the fact that some form of intermediary is always involved in online interactions.” The existence of intermediaries affects conduct of the Internet users as they are often the most effective targets of injunctions and lawsuits. Intermediaries can monitor and control users’ conduct on their networks. Moreover, the regulation of the Internet is possible, in part, by regulating intermediaries. Three decades after the Internet’s inception, Google, Facebook, Amazon, and other intermediaries have enormous power and control over the web.

Blockchain technology has revived the idea that the Internet may function without intermediaries or gatekeepers. Blockchain is usually decentralized and supported by numerous computers (called “nodes” or “peers”) located in different countries and connected through a peer-to-peer network. Such computers store identical or nearly identical copies of a blockchain and are coordinated by software. Blockchain is usually not centrally maintained, meaning no single party can control it. Web 3.0 is often predicted as decentralized by being based on the blockchain technology.

131 Canavesi, supra note 68.
134 Id. at 10.
135 Id. at 70, at 845-46.
137 Id.
138 Id.
139 Id. at 10.
140 Yadin, supra note 70.
143 Id.
144 Id.
145 Zarrin, et al., supra note 141, at 2843.
Blockchain technology does not always mean decentralization or “disintermediation.”

In some cases, such “disintermediation” may not be welcome. However, often such platforms themselves assume the role of an intermediary.

According to some views, the “ideal” Metaverse shall be decentralized. The Metaverse should offer not only “unparalleled user experience,” but also make users beneficiaries of the new platform. Many believe the Metaverse users should receive their share of the generated profit as a reward for their involvement in the decentralized platform.

Big companies will probably prefer the centralized architecture of the Metaverse. The centralized Metaverse may raise challenges for an open Metaverse platform. For example, Epic Games CEO, Tim Sweeney, believes that “[t]he Metaverse is going to be far more pervasive and powerful than anything else. If one central company gains control of this, they will become more powerful than any government and be a god on Earth.”

Currently, big technological companies still have the choice to support the decentralized Metaverse or to support the creation of the “closed” systems with the aim of extracting value from users’ data. However, in the latter case, users will probably stop using their platforms, because other Metaverse platforms may empower users to own their data and benefit from it.

The centralized or decentralized nature of the Metaverse may also depend on the nature of the software supporting the Metaverse. As any other software, such software may be open source, with various developers contributing to the platform’s development. Or, alternatively, the software may be proprietary. It is more likely

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147 Id. at 319.
148 Id.
149 Id.
150 See Sun, supra note 99.
151 Id.
152 Scott Goodson, If You’re Not Paying For It, You Become The Product, FORBES (Mar. 5, 2012), https://www.forbes.com/sites/markeshare2012/03/05/if-youre-not-paying-for-it-you-become-the-product/?sh=10db4a1c5d6e.
153 Id.
154 Sun, supra note 99.
157 Sun, supra note 99.
158 Id.
160 Id.
that the decentralized Metaverse will be based on open source, which anyone can study, change, and develop.

The final question in this section is how may decentralized and centralized Metaverses co-exist? The answer is unclear. It is possible that users may request such co-existence, forcing the creators of the Metaverse to establish it. For example, NFTs will probably play a significant role in the Metaverse. However, who would want to use NFTs in a closed, centralized Metaverse environment without being able to transfer them to another Metaverse platform?

3. Virtual Reality and the Metaverse

VR is the important technology on which the Metaverse will be based. Creation of the term “virtual reality” is attributed to Jaron Lanier, an American computer scientist, who coined the term in the late 1980s. Merriam-Webster defines VR as “an artificial environment which is experienced through sensory stimuli (such as sights and sounds) provided by a computer and in which one's actions partially determine what happens in the environment.”

The term “VR” seems to be an oxymoron. On one hand, “virtual” means simulated, or unreal. On the other hand, “VR” refers to “reality,” i.e., something that is real. How may something be simulated, unreal, and simultaneously real? This controversy may be clarified by giving “virtual” the meaning of “digital” or “electronic.”

VR users have the illusion of walking, flying, and manipulating objects, in real time. Moreover, users have the feeling of immersion and the ability to navigate in such environments. VR is different from AR. While VR is fully immersive and places

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162 Sun, supra note 99.
users inside a simulated reality, AR combines reality with virtual elements. Both VR and AR are varieties of mixed reality.\textsuperscript{171}

VR has existed for many years; however, in the 1990s and 2000s, users and companies almost abandoned it.\textsuperscript{172} In 2012, Oculus revived VR through the development of a VR headset for video games.\textsuperscript{173} Currently, VR is mostly associated with games. However, for many years, VR has been used for training astronauts, pilots, surgeons, military personnel, and for various other purposes.\textsuperscript{174} VR has recently moved to the film industry with a new VR series, called “Alex Honnold: The Soloist VR.”\textsuperscript{175} The show used VR to follow Honnold, an alpinist, as he ascended mountains in the Dolomites.\textsuperscript{176} An Oculus headset is necessary for watching the VR series and experiencing the same environment as Honnold himself.\textsuperscript{177}

One of the key features of VR is the sense of being at different places than the user’s physical location.\textsuperscript{178} Other activities, such as reading (except reading this article), browsing the Internet, or watching a movie can be engaging, but none create a psychological effect of being at a different place, making VR psychologically unique.\textsuperscript{179} Moreover, VR users sometimes believe they are in the real world and, therefore, act accordingly.\textsuperscript{180} Such sense of true presence does not fully exist in two-dimensional interfaces but can be experienced in more sophisticated 3-D VR platforms.\textsuperscript{181}

What is the difference between VR and the Metaverse? Are they the same? Maybe the Metaverse is a more sophisticated or rebranded version of VR? The issue is complicated by the fact that VR already has its definition, while the Metaverse is described in variety of ways. It seems that VR and the Metaverse are different. Firstly, VR is only one way to experience the Metaverse.\textsuperscript{182} Many users are already experiencing existing virtual worlds without any VR devices.\textsuperscript{183} Secondly, VR and the Metaverse can be distinguished by their purpose, because VR environments may be

\textsuperscript{171} Id. at 335, Mma Afoaku, The Reality of Augmented Reality and Copyright Law, 15 NW. J. TECH. & INTELL. PROP. 111, 113 (2017).
\textsuperscript{177} Id.
\textsuperscript{178} Yadin, supra note 174, at 85.
\textsuperscript{179} Id.
\textsuperscript{181} Id.
\textsuperscript{182} Ball, supra note 37.
\textsuperscript{183} Id.
enjoyed at any time without interaction with other users.\textsuperscript{184} However, the purpose of the Metaverse, as declared by its developers, is connecting more people and making such connections more enjoyable.\textsuperscript{185} Lastly, the ownership of the content differs as developers usually own content on VR, while the Metaverse promises to grant ownership to users.\textsuperscript{186}

4. Opportunities and Challenges of the Metaverse

The development of the Metaverse differs from the history of Internet creation, because the latter was developed by researchers without the initial involvement of corporations.\textsuperscript{187} The Metaverse seems to be developing in a different way: even before its full creation there is huge interest and active involvement of various businesses.\textsuperscript{188} While such a path will affect the Metaverse, specific outcomes may only become clear in the future.

The original architecture of the Internet, as Professor Lawrence Lessig argued, made its regulation extremely difficult.\textsuperscript{189} However, the architecture can always change.\textsuperscript{190} Professor Lessig believed that cyberspace, comparable to the Metaverse, would be “the most regulable space humans have ever known.”\textsuperscript{191} Time will show how the Metaverse regulation will be affected by its architecture.

Time will tell whether users will embrace the new technology and be willing to “put TV on their nose,” as Musk describes.\textsuperscript{192} The COVID-19 pandemic separated people to an unimaginable degree. After such separation, spending more time online may not be acceptable for many people. Moreover, the Metaverse may cause addiction in the same way as the Internet.\textsuperscript{193} According to some views, the Metaverse will meet the needs of younger generations who are already spending substantial time playing online games and buying various digital goods.\textsuperscript{194}

Entertainment and online games may become the major drivers of the Metaverse. Technological progress related to online games has already contributed to

\textsuperscript{185} Id.
\textsuperscript{187} See LAWRENCE LESSIG, CODE: AND OTHER LAWS OF CYBERSPACE, VERSION 2.0 33 (2006); see also Raphael Cohen-Almagor, Internet History, 2 INT’L J. OF TECHNOETHICS, 45, 48-9 (2011).
\textsuperscript{188} See Dean Takahashi, Newzoo: More than 500 companies are building the metaverse, VENTURE BEAT (June 28, 2022), https://venturebeat.com/2022/06/28/newzoo-more-than-500-companies-are-building-the-metaverse/.
\textsuperscript{189} Lessig, supra note 187, at 32.
\textsuperscript{190} Id.
\textsuperscript{191} Id.
\textsuperscript{192} Tangermann, supra note 34.
the idea of the Metaverse. Online games may contribute to interconnectivity among different Metaverse platforms as well. Moreover, online games have already become platforms for mass events such as virtual concerts. In the future, we may see the increase in numbers, varieties, and geographies of such mass events within the Metaverse.

The Metaverse may offer unique opportunities, not only to individual users, but to businesses as well. For example, before buying a certain product, a company may be able to test it in a virtual environment, or a complex factory may be digitally constructed and tested. Small business may buy or lease offices in the Metaverse and operate entirely online, instead of paying for more expensive physical space. Moreover, products acquired on the Metaverse shops may be delivered to a real-world location.

The COVID-19 pandemic has revealed both positive and negative aspects of remote work and has transformed employment. In line with this new reality, some companies have started working on virtual office technologies. For example, Meta is developing a product called Horizon Workrooms, and Microsoft is developing Mesh. Both technologies will allow meetings of avatars in three-dimensional space.

In the Metaverse, every action of users may be recorded and stored for data mining, security, user convenience, and other purposes. The same is true regarding today’s Internet. However, the Metaverse may record not only personal information of users, but also their behavior and habits. Moreover, as Lemley and Volokh argue, VR technologies, the basis of the Metaverse, may often feel like the real world. Therefore, there is high likelihood that people may act the same in the Metaverse as
in the real world but will share secrets and forget that their words and actions are digitally recorded.\footnote{Id.}

The Metaverse may allow the collection and processing of behavioral data of users, such as facial expressions, emotions, eye movement, and body language.\footnote{Daniela Marinelli, The Metaverse needs to keep an eye on privacy to avoid Meta’s mistakes, Cointelegraph (Apr. 23, 2022), https://cointelegraph.com/news/the-metaverse-needs-to-keep-an-eye-on-privacy-to-avoid-meta’s-mistakes; see also Shelly Kramer, Metaverse Privacy Concerns: Are We Thinking About Our Data?, Forbes (June 1, 2022), https://www.forbes.com/sites/forbestechcouncil/2022/06/01/metaverse-privacy-concerns-are-we-thinking-about-our-data/?sh=678a46caffb8.} Currently, big tech companies do not possess such data.\footnote{See Tatum Hunter, Surveillance will follow us into ‘the metaverse,’ and our bodies could be its new data source, Washington Post (Jan. 13, 2022), https://www.washingtonpost.com/technology/2022/01/13/privacy-vr-metaverse/.} However, immersive technology makes collection possible.\footnote{Heller, supra note 36, at 28-9.} How will companies use such information and how will they analyze users’ behavior? Today, the answers to these questions remain unclear. Existing laws do not restrict the collection and processing of such behavioral data.\footnote{Id. at 34-6.} The focus of current privacy laws is more on identity of users.\footnote{Id. at 27.} Behavioral data may be collected and processed for analysis of users’ likes, dislikes, creation of their psychological profiles, and for many other purposes which still remain unclear today.\footnote{Id. at 35.} Some privacy laws, which regulate the collection and processing of biometric data, do not cover physiological data collected in immersive virtual worlds.\footnote{Heller, supra note 36, at 36.} Even when laws extend to such data, they are limited only to “authentication purposes.”\footnote{See Isaque Criscuolo, What Is The Metaverse And What Will The Future Of The Internet Hold?, Domestika (Nov. 30, 2021), https://www.domestika.org/en/blog/9435-what-is-the-metaverse-and-what-will-the-future-of-the-internet-hold.} Lawmakers should think about this problem before the vast amount of behavioral data becomes available to companies and is out of users’ control.

Current privacy problems related to the use of social media will probably migrate to the Metaverse.\footnote{See Rebecca Heilweil, Facebook Is Backing Away From Facial Recognition. Meta Isn’t, Vox (Nov. 3, 2021), https://www.vox.com/2021/11/3/22761598/facebook-facial-recognition-meta.} One such problem is facial recognition of users.\footnote{Id.} While Meta promised to stop this technology on Facebook, its promise does not fully apply to Metaverse products.\footnote{Id.} Moreover, the Metaverse users need various hardware and sensors which may be placed within their homes and offices.\footnote{See Kate O’Flaherty, Why Facebook’s Metaverse Is A Privacy Nightmare, Forbes (Nov 13, 2021), https://www.forbes.com/sites/kateoflahertyuk/2021/11/13/why-facebook-metaverse-is-a-privacy-nightmare/?sh=3b0280e66db8.} Such technology may be extremely invasive and may collect more information about users than companies currently collect today.\footnote{Lesley Harrison, Meta’s Metaverse: The Future Of Digital Experience Marketing?, CMSWire (Feb. 17, 2022), https://www.cmswire.com/digital-experience/facebook-metaverse-the-future-of.} There are many forthcoming questions related to privacy on the Metaverse which cannot be answered with certainty today.
The Metaverse will probably include many interconnected and interoperable worlds. For example, Disney has announced plans to build its own version of the Metaverse. If interoperability is achieved, it could be possible to travel among different Metaverse platforms without changing one’s identity or avatar. This interoperability requirement applies not only to the software of the Metaverse, but to hardware, such as VR headsets. Metaverse hardware should be compatible with different platforms, just as any computer can be used to access different services, such as Google, Facebook, or TikTok. Interoperability between different Metaverse platforms may be encouraged by markets or mandated by law. However, effective interoperability will require uniform standards and the question becomes: who can create such standards? We can draw analogies with the agreement between Apple, IBM, and Motorola signed in 1991 regarding standardization of personal computer technology. Companies working on the creation of the Metaverse may agree on some standardization. However, the creation of standards by private companies may raise antitrust concerns. Moreover, it is not clear whether companies will have enough incentives for the creation of such standards for the Metaverse.

According to Matthew Ball, Metaverse users will experience “continuity of data, such as identity, history, entitlements, objects, communications, and payments.” Such continuity of data may imply the right of users to create their avatars, build online presences, acquire digital property, and leave a meta-digital footprint in the Metaverse. Moreover, such continuity may also imply the right of users to keep their avatars or digital data when moving from one meta-platform to another. This right may be compared to the data portability right laid by the European Union in the General Data Protection Regulation. Data portability obligates data controllers to make the data available in a structured, commonly used, machine-readable, and interoperable format, and allow individuals to transfer the data to
another data controller. Continuity of data may also imply that the Metaverse will be “persistent,” and that it will not stop once a user leaves the Metaverse.

Companies have already started thinking about protecting their trademarks on the Metaverse. McDonald’s filed several trademark applications for a Metaverse restaurant, where a user can order food for online and real-life delivery. McDonald’s trademark will apply to on-line actual and virtual concerts, and other entertainment opportunities within virtual McCafé’s. Further, footwear company Skechers recently filed a trademark application for the sale of virtual merchandise on the Metaverse. Some lawyers predict that the number of Metaverse-related trademark applications will substantially increase due to companies not wanting to ignore the potential of the new technology.

The Metaverse may significantly expand learning opportunities. Online learning has existed for many years—even before the Metaverse became a widely discussed topic. During the COVID-19 pandemic, online education has become the only alternative for students from primary schools to universities. Despite problems, online learning has positives as well, such as remote access to a classroom and affordable cost. In the future, online learning may stay as a form of education, applied alone or in combination with class-room experience.

Opportunities of the Metaverse for learning seem limited only by human imagination. Instead of reading a history book, it may become possible to sit in the Roman Senate, listening to Cicero’s speeches against Catiline. Metaverse experiences may include sailing with Capitan James Cook in his famous voyages. Metaverse classes may also allow visits to archaeological sites or other planets.

Metaverse users will probably be allowed to create copyrightable content to the extent provided by developers. For example, a user may create an avatar from diverse options offered by the developer, combining facial expression, hair color, eyes, body

231 Id. at art. 20.
234 Id.
238 Ara, et al., supra note 40.
239 Id.
240 See Meta, supra note 2. Such opportunity is very likely, considering Meta’s promise that on the Metaverse people can teleport not just to any place, but any time as well, for example, to ancient Rome. Id.
241 Ara, et al., supra note 40.
parts, and other details provided in advance. This may raise the question of who owns copyright on the final work? Will the user and developer own joint copyright on the avatar? Or, alternatively, will the developer’s contribution be considered as de minimis in comparison to the user’s creative contribution, excluding the developer’s copyright claims? In real life, the user and the developer rarely intend to share copyright on the user’s intellectual creation, unless provided for in the respective platform’s terms of use. The finding of a solution may be further complicated if a Metaverse user utilizes a pseudonym. The problem may become more difficult if the work is created by several Metaverse users, raising the issue of joint authorship.

Important challenges of the Metaverse will be the monitoring of users’ behavior. Developers should find ways to control users’ language, gestures, movements, and other activities so as to prevent harassment, bullying, and other improper behavior. Altspace VR, the social platform of Microsoft, employs special moderators who attend online events and control people’s online behavior. Altspace users can block those who behave improperly or can activate a special “space bubble” to protect themselves from others. On Horizon Worlds, which is being developed by Meta, users can block other users from interacting with them or record the incident on a headset and report it to the platform’s administration.

According to some views, we already live “mediated lives,” where corporations control and often manipulate our access to news and information. Corporations provide us with personally customized news, fake news, or deepfakes which distort our perception of the reality. Today, we can go to a public place and enjoy the reality; however, with AR and the Metaverse, this option may disappear as technological companies place digital layers on reality. When fundamental problems already exist, mitigation of the damage is very difficult; therefore, Metaverse technology needs to be correctly built from the very beginning.

Metaverse platforms will be global, with users from around the world. Such platforms must consider the challenges of complying with laws of various jurisdictions. Moreover, different countries may contribute to the creation of the

243 Ochoa, supra note 87, at 962-64.
246 Id.
249 See Olson, supra note 88.
250 Id.
252 Id.
258 Ara, et al., supra note 40.
257 Id.
Metaverse, while other countries may decide to build their own Metaverse. For example, India, a country with a highly developed online gaming sector, may help contribute to the Metaverse.\textsuperscript{258} The Chinese version of the Metaverse may be different and, perhaps, more tightly regulated than other areas of the global Metaverse.\textsuperscript{259}

Settlement of the Metaverse related disputes may also require specific approaches. Creators of the Metaverse may integrate meta-courts with meta-jurisdictions. Terms of use may compel users to settle disputes in such Meta-courts.\textsuperscript{260} Moreover, the Metaverse will require legal advice for novel and challenging problems.\textsuperscript{261} Privacy, data protection, advertising, intellectual property, and many other issues will need reconsideration and application to this unique environment.\textsuperscript{262} Without any doubt, lawyers and lawmakers will be quite busy in the coming years.\textsuperscript{263}

The meta-question which may be asked about the Metaverse is what does it symbolize? Is the Metaverse meant to exist with our world or is it a form of escape intended to take us beyond the real world, full of unresolved problems and horrifying news?\textsuperscript{264} As with many questions raised in this article, there are no definite answers yet.

B. Anticipating Copyright Challenges Within the Metaverse

This part of the article discusses anticipated copyright problems associated with the Metaverse. Based on the currently available information about the Metaverse, it should not raise substantial challenges for copyright law. Therefore, the existing legal framework should be capable of protecting interests of copyright holders on the Metaverse.

The U.S. Supreme Court noted, in Sony Corp. of Am. v. Univ. City Studios, Inc., that “[f]rom its beginning, the law of copyright has developed in response to significant changes in technology.”\textsuperscript{265} Technology is always developing; however, not every advance is significant for copyright law. Innovative technology is only legally remarkable "when its introduction into the mainstream requires a systemic change to the law or legal institutions in order to reproduce, or if necessary, displace, an existing balance of values."\textsuperscript{266} For example, the printing press was legally exceptional


\textsuperscript{259} Dashveenjit Kaur, Metaverse in China will look different from the rest. Here’s why, TECHWIRE (Feb. 17, 2022), https://techwireasia.com/2022/02/metaverse-in-china-will-look-different-from-the-rest-heres-why/.


\textsuperscript{261} See Ara, et al., supra note 40.

\textsuperscript{262} See Pryor & Sessa, supra note 78, at 7.

\textsuperscript{263} Id.


technology and it gave impetus to the creation of copyright law.\textsuperscript{267} While it took many years to solve the legal issues caused by the Internet, it was also the legally remarkable innovation which challenged copyright law.\textsuperscript{268}

If we look at the variety of technologies that the Metaverse may incorporate, implementing regulations may seem challenging. The Metaverse will merge VR, AR, AI, NFTs, cryptocurrencies, decentralized infrastructure, smart contracts, blockchain, and various existing and future innovations.\textsuperscript{269} How can copyright law be enforced in such a complicated virtual world to protect interests of copyright holders?

The Metaverse may raise various challenges for copyright holders. First, policing of copyright infringements on the Metaverse may be difficult.\textsuperscript{270} This challenge may be mitigated by incorporation of special copyright filters in the Metaverse software.\textsuperscript{271} However, it is unclear whether the developers of the Metaverse will be willing, or able, to incorporate such filters. Second, if content creators have acquired rights on a copyrightable work by a license prior to the emergence of the Metaverse, it will be necessary to make sure that such licenses allow use of a work on this new technology.\textsuperscript{272} Considering the complexity of the Metaverse, users of copyrighted content may need broad rights which could be granted under a copyright license.\textsuperscript{273}

Copyright disputes may be a significant challenge for the Metaverse. Such tendency is already clear from lawsuits related to another technology: NFTs. In \textit{Roca-Fella Records, Ind. v. Damon Dash}, in June 2021, music recording company Roc-A-Fella Records sued its co-founder Dame Dash who registered and tried to sell as NFT the copyright on Jay-Z's debut album “Reasonable Doubt.”\textsuperscript{274} While the case has been settled by the parties,\textsuperscript{275} the registration of the album as an NFT and the attempt to sell it were considered a landmark event both for the music industry and the crypto world.\textsuperscript{276}

Additionally, various plaintiffs claimed that Epic Games, Incorporated, the developer of the online game “Fortnite,” copied their dance moves and added them to “Fortnite,” without their consent.\textsuperscript{277} Following the 2019 United States Supreme Court decision in \textit{Fourth Estate Public Benefit Corporation v. Wall-Street.com, LLC}, which was issued after filing of law suits, the plaintiffs were required to register their dances

\begin{footnotes}
\footnotetext{267}{See Nina I. Brown, \textit{Artificial Authors: A Case for Copyright in Computer-Generated Works}, 20 COLUM. SCI. & TECH. L. REV. 1, 40 (2018).}
\footnotetext{269}{Ball, supra note 37.}
\footnotetext{270}{See Pryor & Sessa, supra note 78, at 28.}
\footnotetext{271}{See MGM Studios, Inc. v. Grokster, Ltd., 545 U.S. 913, 940 (2005) (discussing copyright filters).}
\footnotetext{272}{See Pryor & Sessa, supra note 78, at 28.}
\footnotetext{273}{Id. at 51.}
\footnotetext{277}{Ara, et al., supra note 40.}
\end{footnotes}
in the U.S. Copyright Office. As a result, the plaintiffs withdrew lawsuits and proceeded with finalization of the copyright registrations. The U.S. Copyright Office rejected copyright registration of some dances, arguing that certain moves were simply routine and not registrable as choreographic works.

This article expresses hope that copyright law will survive the Metaverse challenge. Some amendments and updates may be necessary; however, in general, the Metaverse should not substantially change copyright law.

1. General Overview of Copyright Law

Copyright law accommodates at least two competing interests. First, it grants authors a limited monopoly on their works, so they may receive revenue from their creations. Second, copyright law grants public access to works for everyone to benefit from content and ideas contained in copyrighted works. However, balancing of these two interests is often a challenging task.

The idea of the balanced copyright law is expressed in Article One of the United States’ Constitution: “[t]he Congress shall have the power [t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” Authors are granted certain rights; however, only for a limited period. Copyright laws of other countries are also based upon the idea of balance.

Under the United States’ Copyright Act, copyright in original works of authorship arises from the moment they are “fixed in any tangible form.” No registration is required. Copyright protection guards from the copying of the expression contained in the work without the creator’s permission. However, it does

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279 Id.
282 Id.
283 U.S. CONST., art. I, § 8, cl. 8.

This Directive lays down rules which aim to harmonize further Union law applicable to copyright and related rights in the framework of the internal market, taking into account, in particular, digital and cross-border uses of protected content. It also lays down rules on exceptions and limitations to copyright and related rights, on the facilitation of licenses, as well as rules which aim to ensure a well-functioning marketplace for the exploitation of works and other subject matter.

287 17 U.S.C § 102(b) (2022).
not protect ideas, procedures, processes, systems, methods of operations, concepts, or principles. While valuable components of many works, they are not protected because copyright law promotes learning and the sharing of ideas. The purposes of learning can be achieved only if facts and ideas are used and reused without any limitation. These exceptions also confirm the principle of balance.

Copyright law is different from other fields of law. First, it is strongly affected by technological progress. Initially created for printed media, copyright law is often amended to accommodate innovative technologies, which cannot be regulated by prior copyright framework. Moreover, copyright law may be changed due to lobbying by copyright holders, such as companies and industries. Lobbying may disrupt the balance between copyright protection for authors and access to works for the public.

As a result, copyright law is sometimes viewed as complicated and counterintuitive. The Internet challenged copyright law. Copyright, following from the direct meaning of this term, means the right to copy. Simply, copyright means control of copying the reproduction of a work. However, the Internet mostly functions by the making of copies. In essence, the Internet is a giant copying machine. For example, by downloading this article from the Internet, you received a digital copy of the file available on a server. Other users may download this article, making their own digital copies. Each digital copy is of the same quality as the original file.

People do not always follow copyright law in their daily life. Personal computers, smartphones, and the Internet gave us greater access to copyrighted content than ever before in the human history. But technology also gave us tools for reproduction and dissemination of this content, sometimes in breach of copyright laws. In 21st century we, the users, have become serial infringers and often engage “in thousands of actions that likely constitute copyright infringement.”

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288 Id.
290 JESSICA D. LITMAN, DIGITAL COPYRIGHT 17 (2d ed. 2006).
291 Leaffer, supra note 281, at 25-7
292 Id.
293 Litman, supra note 290, at 23.
295 Litman, supra note 290, at 23.
296 Leaffer, supra note 281, at 30.
297 Litman, supra note 290, at 177-9 (offering a different opinion).
298 Id. at 25.
299 Id. at 111.
300 JOHN TEHRANIAN, INFRINGEMENT NATION. COPYRIGHT 2.0 AND YOU 1 (2011).
301 Id.
302 Id.
2. Use of Previously Licensed Copyrighted Content on the Metaverse

In the future, we may see challenges related to use of the previously licensed copyrighted content on the Metaverse. Some licenses were signed at a time when no Metaverse was on the minds of the parties. Will such licensees allow use of copyrighted works on the Metaverse?

Use of previously licensed copyrighted content on a newly invented platform is not a new problem.303 Such challenges arose in the past when innovative technologies developed.304 This issue was discussed by courts in the context of the digital technology in *Random House, Incorporated v. Rosetta Books LLC.*305 The *Random House* court found that digital books were outside of the Random House’s copyright license, allowing it to produce works only “in book formats.”306

In general, freedom of contract allows copyright holders to transfer rights on all known or unknown uses of a copyrighted work.307 The problem may arise if the transfer wording is vague, or rights are split between the parties. In such a case, licenses may be interpreted to find the true intent of parties. During copyright license signings, parties often realize that future novel technologies may appear, resulting in the express regulation of such scenarios.308 However, it is quite difficult to foresee an innovative technology several decades in advance. The Metaverse seems to be one of such unforeseeable innovation.

The problem of previously licensed copyrighted content is well illustrated by the ongoing legal dispute between Quentin Tarantino and Miramax Studio, regarding the NFT of the original hand-written script for “Pulp Fiction.”309 The parties had a contract by which Tarantino explicitly reserved certain rights to the screenplay; however, the question is whether those reserved rights cover NFTs.310 By the time of this writing, the dispute will still be pending in court.

United States’ law does not prohibit the transfer of rights on uses of works which are unknown at the moment of transfer.311 At the same time, United States’ copyright law allows authors to terminate any lifetime transfer of copyright and reclaim ownership of their rights thirty-five years after the date of the transfer.312 This

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304 Id.
306 Id.; see also Boosey & Hawkes Music Publishers, LTD. v. Walt Disney Co., 145 F.3d 481 (1998) (discussing whether the language of the 1939 copyright license concerning a musical composition allowed Walt Disney Company to distribute the movie incorporating the musical work on video cassettes and DVDs).
307 Kate Darling, *Contracting About the Future: Copyright and New Media,* 10 NW. J. TECH. & INTELL. PROP. 485, 486 (2012).
308 Id.
311 See Darling, supra note 307, at 488.
right protects the creator when the work is financially successful and allows re-negotiation of an unfair contract. This right was created to “safeguard [...] authors against unremunerative transfers, needed because of the unequal bargaining position of authors, resulting in part from the impossibility of determining a work’s value until it has been exploited.” The termination right does not apply to works made for hire, and, in cases of joint authorship, a majority of authors is required for termination.

Authors who transferred rights on or after January 1, 1978, were first empowered by United States’ law to terminate such transfers starting on January 1, 2013. The termination right remains even if a contrary agreement between the parties exists. Therefore, this right is nonwaivable and inalienable. In the future, we may see termination of copyright transfers or their re-negotiation to regulate issues related to the Metaverse.

Contrary to the United States’ approach, legislation of some countries, such as Spain, Belgium, Greece, Poland, Hungary, and the Czech Republic, do not allow for the transfer of copyright for uses unknown at the time of transfer. Such a restrictive approach may be justified by fairness. While original creators of works should have the opportunity to reap the benefits from the use of their works, often such authors are weak parties in contractual negotiations and are forced to accept unfavorable terms. Due to the legislative restrictions, authors in the above countries will be unable to assign rights on unknown future uses of works. Following from these rules, authors may retain rights on use of their works on the Metaverse, if copyright transfer agreements have been signed prior to the creation of the Metaverse. However, it may be a problem to determine when the Metaverse is actually created. These questions should be answered by courts of such countries in each and every case.

Parties to copyright licenses should draft them carefully to say who owns the Metaverse rights. As discussed in this article, the definition of the Metaverse is still unclear. Therefore, it may not be enough to mention in copyright licenses only the Metaverse rights. Broad wording may be necessary to cover all possible uses of copyrighted works on virtual platforms falling under existing or future definitions of the Metaverse.

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313 Darling, supra note 307, at 486.
314 See Ray Charles Found. v. Robinson, 795 F.3d 1109, 1112 (9th Cir. 2015) (citing H.R. Rep. No. 94-1476, at 124 (1976)).
319 See Darling, supra note 307, at 486. Laws of these countries allow copyright contracts only regarding those uses which are known at the time of the contract. Id.
320 Id. at 487.
321 Id.
322 Id. at 486-87.
3. Artificial Intelligence and the Metaverse

AI may become a fundamental pillar of the Metaverse. Millions of users will experience the Metaverse in real time and it will be updated every second, producing a huge volume of information.\(^{323}\) AI will be necessary for the processing of such information to make sure the Metaverse functions smoothly.\(^{324}\) AI may project into the virtual Metaverse users’ real-world movements, facial expressions, emotions, body language, and speech.\(^{325}\) AI may be used to synchronize users’ speech and avatars’ lip movements.\(^{326}\) Moreover, AI may simultaneously translate speech of the Metaverse users and facilitate access from different countries.\(^{327}\) One potential use of AI may be the identification of users’ illegal behavior.\(^{328}\) AI will probably play a crucial role in blurring the line between the real world and the virtual Metaverse.\(^{329}\) Developers may use AI to induce users to stay and experience the Metaverse for long periods of time.\(^{330}\)

A comprehensive definition of AI does not exist.\(^{331}\) AI systems are often described as “creative, unpredictable, independent, autonomous, rational, evolving, capable of data collection, communicative, efficient, accurate, and having free choice among alternatives.”\(^{332}\) Like humans, AI often functions in an unpredictable way, surprising even its creators.\(^{333}\)

AI may be divided into two main types: narrow and general. Narrow AI is used for “special application areas such as playing strategic games, language translation, self-driving vehicles, and image recognition.”\(^{334}\) General AI refers “to a notional future AI system that exhibits apparently intelligence behavior at least as advanced as a person across a full range of cognitive tasks.”\(^{335}\) A form of general AI is used online for communication with users; however, most human users realize that they are dealing

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\(^{324}\) Id.

\(^{325}\) Id., supra note 17, at 5.

\(^{326}\) Huynh, et al., supra note 17, at 5.

\(^{327}\) Id., supra note 17, at 5.

\(^{328}\) Id., supra note 323.


\(^{330}\) Id. at 679-681.

\(^{331}\) See Kate Darling, *The New Breed: What Our History with Animals Reveals About Our Future with Robots* 40 (Henry Holt Publ’g 2021).

\(^{332}\) Committee on Technology National Science and Technology Council, *Preparing for the Future of Artificial Intelligence* 7 (2016).

\(^{333}\) Id.
with computers, and not humans.\textsuperscript{336} At a certain point, general AI may surpass humans in intelligence.\textsuperscript{337} This moment will be known as “singularity.”\textsuperscript{338}

AI may also be used for harvesting data about behavior, preferences, interests, likes, and dislikes of billions of Metaverse users.\textsuperscript{339} Such data may be analyzed for different purposes, and it will be valuable for advertisers, employers, governments, and other interested parties. In the future, developers of the Metaverse may receive large profits from such data.\textsuperscript{340}

Currently, works created with the help of AI are not protected by copyright law, as such works do not have a human author.\textsuperscript{341} According to the United States’ Copyright Office, “[t]o qualify as a work of “authorship” a work must be created by a human being.”\textsuperscript{342} The United States’ Copyright Office does not register works produced “by a machine or mere mechanical process that operates randomly or automatically without any creative intervention from a human author.”\textsuperscript{343} According to the prevailing view, only humans need copyright protection as an incentive for creativity, not machines or AI.\textsuperscript{344} However, there are arguments that copyright protection may provide incentives for a creator of AI that generates creative works.\textsuperscript{345}

Countries such as Spain, Germany, and Australia, only protect copyright works created by humans.\textsuperscript{346} Georgia follows the same path.\textsuperscript{347} Japan has proposed protection of AI-created works under unfair competition law, not copyright law.\textsuperscript{348} Under this approach, AI can produce an unlimited number of creative works.\textsuperscript{349} If copyright monopoly applies to content, it may threaten human creativity by barring the creation of similar works.\textsuperscript{350}

The European Union (“EU”) is reviewing whether the human authorship requirement should remain in copyright law.\textsuperscript{351} In 2020, the EU published its Report

\textsuperscript{336} Id. at 336.
\textsuperscript{337} KATHERINE B. FORREST, COPYRIGHT LAW AND ARTIFICIAL INTELLIGENCE: EMERGING ISSUES 347, 352; see also THEODORE FRANKLIN CLAYPOOL, THE LAW OF ARTIFICIAL INTELLIGENCE AND SMART MACHINES: UNDERSTANDING A.I. AND THE LEGAL IMPACT (ABA Book Pub’g, 2019).
\textsuperscript{338} See Darling, supra note 333.
\textsuperscript{340} See Kramer, supra note 208.
\textsuperscript{341} See Yanisky-Ravid, supra note 331, at 670.
\textsuperscript{343} Id. at 21-2; see also Naruto v. Slater, No. 16-15469 (9th Cir. 2018) (holding that the crested macaque monkey cannot be an author of a selfie).
\textsuperscript{344} Committee on Technology National Science and Technology Council, supra note 334, at 337.
\textsuperscript{345} Brown, supra note 267, at 20.
\textsuperscript{346} Committee on Technology National Science and Technology Council, supra note 334, at 336, 345.
\textsuperscript{348} Committee on Technology National Science and Technology Council, supra note 334, at 336, 345.
\textsuperscript{349} Id.
\textsuperscript{350} Id.
If the Metaverse is Built, Will Copyright Challenges Come?

Exclusion of AI produced works from copyright protection due to non-existence of human authorship is often criticized. Neither the United States’ Constitution nor Congress, through the Copyright Act, expressly require human authorship. Moreover, the Copyright Act grants authorship to non-humans at least in one case, namely in “work for hire” arrangements. The Copyright Act requires that “[i]n the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author.” In most cases, an employer is a company, but not a human.

The Metaverse may accelerate bringing AI-generated works under the copyright umbrella or granting such works protection through other legal means. This article does not argue in favor of any specific solution. This issue is quite complex, and it is outside of the scope of this article. However, the Metaverse will likely stimulate active discussion of legal protection of AI generated works.

4. Copyright of Metaverse Software

Software will likely be one of the most important pillars of the Metaverse. The creation of such software will be a complex task, requiring the involvement of many programmers. Nvidia, for example, opened access to Omniverse, its real-time 3-D design Metaverse building software platform for creators and artists. The company is also working on the “M]etaverse for engineers.” According to Nvidia, Omniverse was downloading more than one hundred thousand times by January 2022.

352 Id.
353 Id.
354 See Brown, supra note 267, at 5.
355 Id. at 29.
356 Id.
358 Brown, supra note 267, at 29.
359 See Shlomit Yanisky-Ravid, Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era: The Human-like Authors Are Already Here: A New Model, 2017 Mich. St. L. Rev. 659, 705 (2017). According to one proposal, AI generated works may be protected under Works Made for Hire model, according to which the AI system would be a creative employee or an independent contractor. As a result, ownership on the work would be granted to humans or legal entities that use AI systems and enjoy its benefits. Id.
362 Id.
363 Id.
Most jurisdictions protect software under copyright law, as a literary work. Since 1980, the United States' Copyright Act also protects “computer programs” as literary works. The EU follows the same approach. In 1991, the European Community agreed the Software Directive which clarifies copyright protection of software and regulates mandatory exceptions.

In general, software may be closed-source or open-source. Closed-source is usually proprietary, like Apple’s iOS, and users cannot change or study it. On the other hand, the open-source software is open for anyone to study and develop, such as Android’s software. Such software is not a classic copyrightable work. Rather than using copyright law to maximize revenue, open source relies on copyright to allow free access and wide distribution of the software. While open-source software is provided to users for free, software providers still earn revenue, not from selling but by supplying consultations and other services.

Interoperability is valuable for various fields, but in case of the Metaverse it may be particularly important as the Metaverse will likely be based on software created by various developers. Moreover, some platforms may be proprietary, based on closed-source software. On the other hand, some platforms may be based on open-source. The future of the Metaverse may depend on which approach prevails. Moreover, interoperability between different Metaverse platforms may require reverse engineering of software. Copyright laws of most jurisdictions allow such reverse

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In accordance with the provisions of this Directive, Member States shall protect computer programs, by copyright, as literary works within the meaning of the Berne Convention for the Protection of Literary and Artistic Works. For the purposes of this Directive, the term ‘computer programs’ shall include their preparatory design material.

368 Stokes, supra note 364, at 158-9.
369 Id.
371 Id.
372 Id.
373 Pryor & Sessa, supra note 78, at 27.
374 Karyn Gorman, Open or closed? A key battle over the metaverse is underway that will decide the buzzy technology’s future, FORTUNE (Mar. 12, 2022), https://fortune.com/2022/03/12/metaverse-open-closed-source-nft/.
375 Id.
376 Id.
377 See Stokes, supra note 364, at 158-59; see also Leaffer, supra note 281, at § 10.13.
5. Blockchain Technology and the Metaverse

Blockchain may have a huge role on the Metaverse. According to some, the Metaverse may be successful only if it is decentralized, based on blockchain, and open for all contributors. On Web 2.0, big companies control data while bringing in large profits from it. On the other hand, Blockchain may give control over data to its users.

Blockchain revolutionized the recording, storing and synchronization of digital information. Blockchain may be defined as “distributed ledger technology” as it uses a peer-to-peer network of computers to store a ledger of synchronized data. Such data is not controlled by a single entity or a single controller. Rather, it is controlled by a consensus of users jointly agreeing to modify such data. As a result, blockchain is disintermediated, contrary to the Web 2.0 Internet, which is centralized and controlled by big corporations.

Blockchain blends several prior technologies, such as peer-to-peer networks, public-private key cryptography, and consensus mechanisms. As a result, blockchain creates “what can be thought of as a highly resilient and tamper-resistant database where people can store data in a transparent and nonrepudiable manner and engage in a variety of economic transactions pseudonymously.” Blockchain technology allows for the hiding of users’ identity; however, most blockchains rely on pseudonymous technology, rather than purely anonymous technology.

Blockchain may also be a main pillar of the Metaverse. Firstly, blockchain technology is viewed as more secure than the centralized infrastructure. Secondly, blockchain may allow for the incorporation of NFTs, smart contracts, and

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See 17 U.S.C. § 1201(f) (2022); see also Council Directive No. 2009/24/EC, art. 6, 2009 O.J. (L 111) 16 on the legal protection of computer program. In 2021, the Court of Justice of European Union (CJEU) ruled that the reverse engineering of software to correct errors in the functioning of that software does not infringe copyright (case C-13/20, Top System SA v. Belgian State). Id.


Evans, supra note 62, at 233-34.

Id.


Id. at 42.

Doss, supra note 381, at 65-6.

Filippi & Wright, supra note 385, at 2; see also Balazas Bodo, et al., supra note 146, at 313-4.

Filippi & Wright, supra note 385, at 2.

Id. at 83.

cryptocurrencies. Thirdly, blockchain may facilitate interoperability of different Metaverse platforms. Fourthly, the Metaverse may be successful only if all users can experience identical, synchronized, virtual environments, and the decentralized blockchain may allow for such synchronization. Lastly, blockchain may function globally, providing access to the Metaverse without involvement of a centralized authority.

Technology, which may “give birth” to the Metaverse, can also help prevent copyright infringements common on the Internet. On Web 2.0, one of the challenges copyright holders face is an inability to police copyright infringements and enforce rights. However, problems created by one digital technology may be solved by applying other digital technology, such as blockchain. Blockchain allows for the registration of work in digital form, attaching, “a unique fingerprint (also known as a cryptographic hash) for each copyright record . . . [that] contains the image file as well as the copyright owner’s name and email.” Having registered a work, copyright holders may digitally police various websites to find infringing content. However, despite its importance, blockchain cannot solve all copyright problems of the Metaverse.

III. CONCLUSION

It is currently unclear who will build, own, or run the Metaverse. Even the definition of the Metaverse is still under discussion. Despite the uncertainty that exists, at least two things are clear. First, the Metaverse feels real and there is some evidence that it may become reality. Second, the Metaverse may raise various legal issues, including ones related to copyright law. These issues require legal analysis which may keep lawyers and lawmakers busy for many years to come.

In this article, the Metaverse is described as the immersive Internet where users utilize headsets or other equipment within a three-dimensional online environment. Users must utilize avatars to represent them in the Metaverse. The
Metaverse promises to blur the line between the real world and virtual reality. Despite this futuristic concept, some studies suggest that such blurring is possible.

The Metaverse will probably develop faster than adoption of its legal regulation. Moreover, global regulation will also be a significant challenge. If the regulation of the Metaverse is adopted too early, without substantial research and open discussion, it may not bring desired results. On the other hand, if the technology develops unchecked and uncontrolled, its ensuing damage may be irreversible.

This article argues that despite merging various technologies, the Metaverse should not require fundamental changes to copyright law. The article expresses hope that the core principles of copyright law can provide answers to most Metaverse related copyright challenges. At the same time, we should be mindful of the fact that copyright law has not fully adapted to the realities of the Web 2.0 Internet. This article does not provide answers to all questions related to the Metaverse and its possible copyright challenges. Its purpose is to start a discussion of potential problems.

It is unclear how the Metaverse may affect users' privacy. However, if developed, the Metaverse will likely raise challenges related to the collection and processing of users' behavioral data such as facial expressions, emotions, eye movements, and body language. Currently, big technological companies do not possess such data. How will companies use such information and how will they analyze users' behavior? Today, the answers remain unclear. However, these issues require the attention of lawmakers before the behavioral data is available to big companies and is rendered forever out of users' control.

I conclude this article by expressing hope that the humanity will not hide in the Metaverse from its real-life problems. The Metaverse may be used for various beneficial purposes, but it should not become a dystopian nightmare where people spend most of their time aiming to escape from a disappointing reality.

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406 Pryor & Sessa, supra note 78, at 5.
407 Lemley & Volokh, supra note 17, at 1136 (according to cognitive research, users of VR often act in the same way as in the real world); see also Yadin, supra note 70, at 842.
408 Dwoskin et al., supra note, at 56.
412 See Hunter, supra note 209.