

**ANTI-COMPETITIVE ACTIVITIES OF METAVERSE AND ARTIFICIAL
INTELLIGENCE IN COMPETITIVE MARKET**

- ARANYA NATH & SRABANI BEHERA*

ABSTRACT

Since the development of the internet in the 1990s till date, there has been considerable progress in the virtual environment. The internet has opened ways for users to use the cyberspace through social media platforms and has brought digital transformation from cell phones to smartphones and Artificial Intelligence. The metaverse is a step ahead of the internet age to create a virtual reality for the user within their physical world and will continue to transform how the virtual world is perceived. It will change how current business is conducted and the experiences shared between users and companies and will create a distinct and thin line between the physical and virtual life.

The development of the metaverse and the creation of virtual reality will impose on companies the need to extract more resources to have a first-mover advantage. It might lead to the creation of an artificial entry barrier and will impact various industries. The question arises: Will the current regulation be sufficient to deal with the hinge that the virtual space will impose and make it accessible to more users and industries? Will the metaverse create a virtual artificial market with only a few players entering and accessing the market as a cartel? What will be the impact of abusive dominance in the metaverse world in the coming years? The biggest question that will be posed is the use of data by the owners of the metaverse, which would make the entry or expansion of competitors more difficult.

This paper examines and discusses the regulatory transformation that the metaverse will lead to in various countries, how it will impact the competition in multiple industries, and the regulatory reforms about the data accessed by the metauniverse owners.

Keywords- Virtual Environment, Cyberspace, Artificial Intelligence, Virtual artificial market, Cartel, Competition Law, IT Sectors

* Mr. Aranya Nath is a PhD Scholar at Damodaram Sanjivayya National Law University Visakhapatnam & Ms. Srabani Behera is a fourth year law student at KIIT School of Law, Bhubaneswar, Odisha.

I. INTRODUCTION

The term "metaverse" is a combination of the words "meta" and "universe." It alludes to a digital world developed with such technologies as blockchain,¹ computer vision,² pervasive computing,³ scene understanding,⁴ and ubiquitous interfaces.⁵ In Web 3.0, a special strain of the internet will evolve as the real essence of the user is altered. For the general public, video games and e-gaming are seen as an entry point into the metaverse. The rapidly expanding Indian gaming sector can seize this chance to develop metaverse technology and become a worldwide leader.⁶ The term "metaverse" was coined in the 1992 Neil Steven novel "Snow Crash" to refer to a digital world.⁷ With Sensorama, the very first VR machine, in 1956, the infrastructure and technology to bring the metaverse into reality progressed significantly. Following that, Second Life was the first project that resembled the metaverse,⁸ and it was followed by a slew of additional platforms, including AR/VR services, which increased the reach of the metaverse. Experts predict that AR/VR and the metaverse will continue to advance shortly, open new doors and drastically alter digital economies, working environments, and social experiences.⁹

While there is still a need for clarification and consensus on what this new digital capability entails and how it should grow in governance, many people believe that the metaverse will be the next big internet iteration, penetrating our social element. There is a high likelihood that

¹ 'Blockchain Facts: What Is It, How It Works, and How It Can Be Used' (*Investopedia*) <<https://www.investopedia.com/terms/b/blockchain.asp>> accessed 28 December 2022.

² 'What Is Computer Vision? | IBM' <<https://www.ibm.com/in-en/topics/computer-vision>> accessed 28 December 2022.

³ 'What Is Ubiquitous Computing (Pervasive Computing)?' <<https://www.techtarget.com/iotagenda/definition/pervasive-computing-ubiquitous-computing>> accessed 28 December 2022.

⁴ François Bremond, 'Scene Understanding: Perception, Multi-Sensor Fusion, Spatio-Temporal Reasoning and Activity Recognition' (thesis, Université Nice Sophia Antipolis 2007) <<https://theses.hal.science/tel-00275889>> accessed 28 December 2022.

⁵ 'What Is Ubiquitous Computing (Pervasive Computing)?' (n 3).

⁶ Pankaj Wajire, 'Exploring the Metaverse: Challenges and Opportunities for India in the "Next Internet"' (*ORF*) <<https://www.orfonline.org/research/exploring-the-metaverse/>> accessed 2 May 2023.

⁷ 'The Creator of the Term "metaverse" Wants People to Know He Has "Nothing to Do" with Facebook's Meta Plans | Business Insider India' <<https://www.businessinsider.in/tech/news/the-creator-of-the-term-metaverse-wants-people-to-know-he-has-nothing-to-do-with-facebooks-meta-plans/articleshow/87382659.cms>> accessed 26 November 2022.

⁸ 'Zuckerberg's Metaverse: Lessons from Second Life - BBC News' <<https://www.bbc.com/news/technology-59180273>> accessed 26 November 2022.

⁹ 'Investing in the Metaverse: New Opportunities in Virtual Worlds' (Morgan Stanley) <<https://www.morganstanley.com/articles/metaverse-opportunities-virtual-reality-augmented-reality-technologies>> accessed 26 November 2022.

we will miss out on this evolution unless we take an active role in shaping its development and its consequences.

II. RESEARCH METHODOLOGY

The research is purely doctrinal, analytical & exploratory. In this study, the researcher is trying to evaluate the metaverse and Artificial Intelligence in the competitive market. Over here, the researcher uses the doctrinal method of research where the authors collected all the information related to the research from various articles, journals, e-books, and other secondary sources.

III. HOW PRECISELY WOULD THE METAVERSE PERFORM?

The metaverse is the next evolution of the web, enabling creatives to work together and provide integrated, immersive experiences depending on activities.

According to what we can say, there are two distinct metaverses: one is a closed, centralised platform controlled by Big Tech, along with the other is a decentralised one that utilises open protocols and blockchain-based technologies. Cryptocurrencies, non-fungible tokens, as well as decentralised autonomous organizations are all instances of open protocols and blockchain technologies. The two versions differ in terms of interoperability, sovereignty, decentralized administration, and financial systems.¹⁰ In this study, we have methodically examined the present trends and the many legal and regulatory frameworks that must adapt to fit the improvements of the metaverse. Before getting into an in-depth analysis of its impact on a select group of crucial organisations, the article provides a brief introduction to a number of topics related to convergence in the metaverse. We also considered potential legal and tax difficulties that could occur in the future.

A. Metaverse and its convergence

¹⁰ 'OV-Metaverse-OS_V6.Pdf' <https://outlierventures.io/wp-content/uploads/2021/08/OV-Metaverse-OS_V6.pdf> accessed 26 November 2022.

Through the integration of actual and virtual environments, the Metaverse creates an experience that is seamless for the user. The use of an "Avatar"¹¹ created by experts like Jon Radoff have identified seven components that support the Metaverse: "Experience," "Discovery," "Creator Economy," "Spatial Computing," "Decentralization," "Human Interface," and "Infrastructure."¹² Augmented and virtual reality, artificial intelligence, non-fungible tokens, blockchain, and the Internet of Things are all contributing technologies to the eventual realisation of the Metaverse, and bring the various layers of the metaverse to completion.

B. Augmented Reality/ Virtual Reality

Augmented and virtual reality technologies have enhanced the immersiveness of the metaverse by expanding the possibilities of spatial computing and improving human interaction beyond the limitations of legacy technology. Emerging technology known as Mixed Reality combines elements of virtual reality (VR) with augmented reality (AR), creating a new mixed experience ("MR").¹³

In theory, MR technology might let users have an experience that fuses their actual, augmented, and digital environments in real time. All of these methods and tools have seen extensive use in the past. Immersive experiences within metaverse platforms are now available on Oculus Quest 2, Samsung, and PlayStation VR headsets. Consumer products like the HTC Vive Flow advance wearable technology to the next level of the metaverse's human interface by transforming virtual reality (VR) gear from a bulky headpiece into a lightweight, detachable set of goggles.¹⁴ Businesses like Snapchat, IKEA, and Pokémon have also used AR technologies to help consumers place digital aspects on their physical reality (bodies, houses,

¹¹ 'Opportunities in the Metaverse.Pdf' <<https://www.jpmorgan.com/content/dam/jpm/treasury-services/documents/opportunities-in-the-metaverse.pdf>> accessed 26 November 2022.

¹² 'The Metaverse Value-Chain. Trillions of Dollars Are Pouring Into... | by Jon Radoff | Building the Metaverse | Medium' <<https://medium.com/building-the-metaverse/the-metaverse-value-chain-afcf9e09e3a7>> accessed 26 November 2022.

¹³ qianw211, 'What Is Mixed Reality? - Mixed Reality' <<https://learn.microsoft.com/en-us/windows/mixed-reality/discover/mixed-reality>> accessed 26 November 2022.

¹⁴ 'VIVE Flow - VR Glasses for Your Metaverse Journey | United States' <<https://www.vive.com/us/product/vive-flow/overview/>> accessed 26 November 2022.

and streets). Enabling holographic technology through products like Microsoft's HoloLens 2 would only increase its use in fields like education, healthcare, engineering, etc.¹⁵

C. Internet of Things (or "IoT")

A substantial part of the metaverse's infrastructure relies on the internet, and this connectivity is further extended into the real world by the Internet of Things (IoT). While doing so, its function blends digital and physical elements, bridging the gap between the two. For this reason, the "Internet of Things" is the result of any convergence of perfect technologies that can talk to one another and do tasks that are ultimately valuable to humans. Sensors in home appliances like thermostats and voice-activated speakers collect and respond to a wide range of data thanks to the Internet of Things, which connects thousands of devices. Also, the massive amounts of data obtained from the virtual online world of the metaverse build the infrastructure of the platform and a more interconnected world.

One possible use of IoT is the use of a "Digital Twin," a virtual duplicate that shares many of the same characteristics as the original but is updated in near-real time.¹⁶ In conclusion, the IoT allows for the smooth integration of a wide variety of physical objects into a 3D setting. It might turn out to be the factor whose convergence is crucial for expanding the Metaverse. Once complete compatibility is achieved, only then may it be possible to imagine the correct scale.¹⁷

D. Artificial Intelligence

Immersion in the Metaverse entails several different components, such as exploration, creator economics, spatial computing, and infrastructure, all of which might be fuelled by artificial intelligence. Through the intelligent evaluation of data inputs like speech through Alexa or textual/visual inputs using NVIDIA's GauGAN2, AI algorithms may help automate IT processes, intelligently network, process language, make personalised recommendations, and

¹⁵ Yogesh K Dwivedi and others, 'Metaverse beyond the Hype: Multidisciplinary Perspectives on Emerging Challenges, Opportunities, and Agenda for Research, Practice and Policy' (2022) 66 *International Journal of Information Management* 102542.

¹⁶ 'How to Leverage Internet of Things (IoT) Opportunities in the Metaverse' <<https://accelerationeconomy.com/Metaverse/how-to-leverage-internet-of-things-iot-opportunities-in-the-Metaverse/>> accessed 26 November 2022.

¹⁷ 'From the IoT to Metaverse - Polystream' <<https://polystream.com/from-the-iot-to-Metaverse/>> accessed 26 November 2022.

allow for total immersion within the digital realm.¹⁸ Organizations are also contributing to AI development with initiatives like self-supervised learning and gesture detection.

It is envisaged that the Metaverse would be able to give a more realistic virtual experience by monitoring things like eye and body movement.¹⁹ Another use of AI in the Metaverse is in the production of Avatars, or digital personas.

E. Blockchains

Blockchain is critical to preserving digital security and identity checks and running smart contracts (digital contracts created and performed on the blockchain) for metaverse trading. This technology is widely used on platforms such as VRChat, which runs virtual markets, and Crypto voxels, which organizes virtual art exhibits. Another critical use for blockchain in this expanding technical area is preserving individuality and property rights in order to boost the creator economy via NFT-based businesses.

IV. USAGE OF METAVERSE IN VARIOUS INDUSTRIES

A. Gaming

The gaming industry has been pushing other industries to adopt cutting-edge technologies such as augmented reality (AR), virtual reality (VR), video streaming, real-time 3D rendering, NFTs, blockchains, cryptocurrencies, and compatible architecture because roughly 40% of the world's population, or 3.24 billion people, are gamers.²⁰ We may already enjoy games like Axie Infinite, Fortnite, Roblox, and plenty more Axie Infinity, a game that aims to gather "Smooth

¹⁸ Isha Salian, 'GauGAN Turns Doodles into Stunning, Realistic Landscapes' (*NVIDIA Blog*, 18 March 2019) <<https://blogs.nvidia.com/blog/2019/03/18/gaugan-photorealistic-landscapes-nvidia-research/>> accessed 26 November 2022.

¹⁹ 'Meta Describes How AI Will Unlock the Metaverse' (*VentureBeat*, 2 March 2022) <<https://venturebeat.com/technology/meta-describes-how-ai-will-unlock-the-metaverse/>> accessed 26 November 2022.

²⁰ 'Cartoons And Video Games Evolved Into Bitcoin And NFTs' <<https://www.forbes.com/sites/davidblack/2022/05/05/cartoons-and-video-games-evolved-into-bitcoin-and-nfts/?sh=6633a9ff316e>> accessed 26 November 2022.

Love Potions," which work similarly to bitcoins and may be exchanged or sold in the future, has over 350,000 daily active participants.²¹

Furthermore, Epic Games' Fortnite is an online place where users may design personalized landscapes and fight zones, with a record-breaking 15 million people logging in simultaneously. In this context, metaverse gaming is more versatile since players will have more latitude for customization in creating their virtual locations and establishing sub-games within a bigger game. Indeed, the ability for users to create their own microgames that other users' Avatars may play in exchange for Roblox's virtual currency, called "Robux," was a major factor in the platform's meteoric rise to prominence. Players are given a variety of in-game tokens, cryptocurrencies, and NFTs as rewards, proving that Game-Fi (short for Game Finance) is an integral aspect of Metaverse gaming. This idea is predicated on a play-to-earn model, in contrast to more conventional video games, and it allows players to take their virtual possessions with them when they leave the game.

B. Real Estate

Over \$500 million was transacted in the metaverses' virtual real estate markets,²² with that number predicted to grow to over \$1 billion in 2018. To generate revenue for the platform, developers create massive maps of property that are then split into tiny digital real estate "parcels." For instance, the Decentral platform supports the buying and selling of digital land plots with the cryptocurrency MANA. What defines the parcel's value is its usefulness, proximity to amenities, population, and the demand-supply dynamic. When you have virtual property, you can use it however you like, including developing software, displaying NFTs, displaying adverts, hosting events, or renting it out to others who need virtual space. Brands

²¹ 'Ladbrokes Owner Entain Eyes Metaverse with New Innovation Hub | Reuters' <<https://www.reuters.com/world/uk/entain-targets-metaverse-with-new-innovation-hub-2022-01-31/>> accessed 5 June 2023.

²² Robert Frank, 'Metaverse Real Estate Sales Top \$500 Million, and Are Projected to Double This Year' (CNBC) <<https://www.cnbc.com/2022/02/01/metaverse-real-estate-sales-top-500-million-metametric-solutions-says.html>> accessed 29 December 2022.

like Adidas, Clinique,²³ and Forever 21²⁴ are expected to be among the first competitors in the digital real estate market.²⁵

The leader in Metaverse and NFT investments, Republic Realm, reportedly paid \$4.3 million for a plot of virtual real estate. Ninety of the estimated 1.1 million "dream islands" built in the Sandbox Metaverse, each with a house, a boat, a jet ski, and other amenities, sold on the first day for roughly \$15,000, with a few others selling for \$100,000. While the metaverse is likely to grow in the future, there are still many unknowns, such as if a metaverse platform goes offline, it may permanently delete all assets saved on it. If these challenges are addressed, metaverse will become firmly established in the real estate sector.²⁶

C. Healthcare

Technology and healthcare convergence is not a new concept. Wearables, telemedicine, e-pharmacies, online general practitioners, and other applications are available in the digital health industry. With the introduction of the metaverse, the healthcare sector poises expanding the use of AI and AR/VR in healthcare to improve patient outcomes and accelerate scientific progress.²⁷ Healthcare organisations and eHealth businesses in India are²⁸ investigating the viability of introducing meta-hospitals, virtual reality activities, and health wellness metaverse platforms. Counselling and psychotherapy therapies involving issues with mental health are also major areas of focus for healthcare professionals. Companies like Moody Links²⁹ are using

²³ 'Metaverse Like Us | Clinique' <<https://www.clinique.com/metaverselikeus>> accessed 29 December 2022.

²⁴ 'Forever 21 x Barbie Launches In-Store, Online and in the Metaverse | Business Wire' <<https://www.businesswire.com/news/home/20220607005321/en/Forever-21-x-Barbie-Launches-In-Store-Online-and-in-the-Metaverse>> accessed 29 December 2022.

²⁵ 'Virtual Real Estate in the Metaverse Is Booming, Be a Part of It Now!' <<https://timesofindia.indiatimes.com/blogs/voices/virtual-real-estate-in-the-metaverse-is-booming-be-a-part-of-it-now/>> accessed 29 December 2022.

²⁶ 'A Plot of Virtual Land That Went for \$4.3 Million in The Sandbox Is the Most Expensive Metaverse Property Sale Ever | Business Insider India' <<https://www.businessinsider.in/stock-market/news/a-plot-of-virtual-land-that-went-for-4-3-million-in-the-sandbox-is-the-most-expensive-metaverse-property-sale-ever/articleshow/88015620.cms>> accessed 5 June 2023.

²⁷ 'Healthcare Companies Are Entering the Metaverse. But Can It Help the Sector? - Business Today' <<https://www.businesstoday.in/crypto/story/healthcare-companies-are-entering-the-metaverse-but-can-it-help-the-sector-338719-2022-06-22>> accessed 26 November 2022.

²⁸ 'AEMO_entertainment_and_media_2019_final.Pdf' <https://africa.mediaoutlook.pwc.com/dist/assets/pdf/AEMO_entertainment_and_media_2019_final.pdf> accessed 5 June 2023.

²⁹ 'Moody Mink Society | NFT' (*moody mink society*) <<https://www.moodymintedminks.com>> accessed 29 December 2022.

the Metaverse platform to expand their reach for mental health courses and support programs. Joint remote operations and treatments are among the more complicated metaverse uses in health. Robot-assisted surgeries are becoming routine for managing intricate tasks with accuracy and adaptability. This is achieved by the metaverse's integration of the current crop of technological possibilities physicians might perform remote surgeries more effectively. The Metaverse is also expected to develop medical training and gain a footing in education.

V. COMPETITION OF METAVERSE IN INDUSTRIES

India's gaming sector is expanding, with mobile and computer video games accounting for a substantial percentage. Only China will have more than 450 million subscribers by 2020.³⁰ In 2021, the mobile-based casual-gaming market will create roughly US\$0.7 billion, while the e-sports sector will make US\$26 million.³¹ The Indian gaming and animation industries have taken the first step towards creating content that is distinctive to the country.³² Loka, for example, is a start-up established in New Delhi that is the country's first multiplayer gamified virtual metaverse.

In March 2021, OneCare will launch its first play-to-earn food metaverse game. "Zion Verse's" NFTs for the metaverse are "Trimurti", based on Hindu goddesses, and the "Lakshmi Zion Verse" which claims to have sold over 5,000 NFTs in 19 days.

Possible Issues

As governments investigate the value of this technology, they will face their possible issues.

A. Security

³⁰ 'China's Online Mutual Aid Market Expected to Triple to 450 Million Users by 2025' (7 May 2020) <<https://www.businesswire.com/news/home/20200507005383/en/Chinas-Online-Mutual-Aid-Market-Expected-to-Triple-to-450-Million-Users-by-2025>> accessed 5 June 2023.

³¹ 'AEMO_entertainment_and_media_2019_final.Pdf' <https://africa.mediaoutlook.pwc.com/dist/assets/pdf/AEMO_entertainment_and_media_2019_final.pdf> accessed 5 June 2023.

³² Pankaj Wajire, 'Exploring the Metaverse: Challenges and Opportunities for India in the "Next Internet"' (*ORF*) <<https://www.orfonline.org/research/exploring-the-metaverse/>> accessed 5 June 2023.

Even before Meta's metaverse went worldwide, an assault on a beta tester in its VR social networking platform Horizon Worlds warned users about the technology's dark side. Bullying might occur throughout the virtual world because the metaverse blurs the line between virtual reality and reality and is largely unmanaged and uncontrolled. According to the first report of a VR-related death from Moscow, a 44-year-old man died after falling through a pane of glass while wearing an HMD headset. As more individuals engage in immersive technology, early user protection will benefit both individuals and the platform, addressing the trust imbalance. Companies in the immersive technology space can be motivated to create more apps for a safer metaverse environment, allowing a larger demographic to experience the technology. Because the metaverse is seen as an appealing entertainment arena for youngsters, keeping kids safe while using technology will be a big task. Time spent alone in the open social metaverse could expose them to exploitation.³³

Furthermore, because the barrier between reality and the virtual world is blurred, even adults are exposed to the hazards that VR might create. During her first metaverse encounter in “Altspace”, Lousie Eccles of the Sunday Times, for example, was presented with virtual sexual and sex-related remarks. Racist, homophobic, transphobic, and virtual groping are more likely to occur in multiuser social settings in the metaverse.

B. Interoperability and confidentiality

Another worry is that the metaverse will be dominated by a few Big Tech businesses such as Google, Amazon, Meta, Apple, and Microsoft. The economics behind the metaverse, therefore, will be connected to the acquisition of user data, making privacy protection a significant concern.

VI. USE OF ANTITRUST AND COMPETITION LAWS

The unusual characteristics of the metaverse have made it difficult to enforce established legal norms without causing friction. As long as there has been a metaverse, anti-trust has been preoccupied with ontological conundrums.

³³ Dwivedi and others (n 15).

The Competition Act of 2002 prohibits any agreement, combination, or conspiracy with the intent to restrain trade, as well as any agreement, combination, or conspiracy to dominate, attempt to control, or monopolise any market.³⁴ Unreasonable restrictions are also prohibited.

Therefore, it may invoke this act if there are multiple competing apps in a market and one unfairly dominates or threatens to become a monopoly. However, the metaverse's fundamental structure and the blockchain makes it difficult to identify and penalise such activities, allowing businesses to participate in such techniques with little to no fear of repercussions.

Private blockchains make it possible for anticompetitive businesses to share price-related and other commercially sensitive data. These blockchains are private and can only be viewed by those who have been granted access by the blockchain's owner. While law enforcement won't be allowed to eavesdrop on these communications and bring criminal charges, they still have the right to request similar data in accordance with applicable regulations. As opposed to the current system, where authorities can obtain evidence by visiting business locations, this new system does not allow for such inspections.³⁵ Thirdly, anti-competitive firms can share commercially sensitive information, such as information related to pricing, amongst themselves using private or permissioned blockchains, which can only be accessed by users who have the permission of the blockchain owner. Such blockchains will prevent authorities from accessing these exchanges and subsequently punishing such conduct. This comes in direct contrast to the current scenario where the authorities can simply conduct dawn raids at companies' facilities to gather evidence.

VII. HOW WILL THE METAVERSE CHANGE THE FUTURE OF BUSINESS?

The future beholds the growth of virtual reality and with the continuous shift of business and its growth potential being unleashed by business shows that in the near future, the metaverse

³⁴ 'Section 5 in the Competition Act, 2002' <<https://indiankanoon.org/doc/632687/>> accessed 5 June 2023.

³⁵ Vivek kumar, 'EXPANDING THE META: EXPLORING THE LEGAL RAMIFICATIONS OF THE METAVERSE' (*RGNUL Student Research Review (RSRR)*, 6 December 2021) <<https://rsrr.in/2021/12/06/legal-ramifications-of-the-metaverse/>> accessed 5 June 2023.

will change the business dynamics with top players ruling the market and using it to the best of their potential to regulate the real and virtual reality.³⁶

In the recent set of events if we consider Facebook changing its name to Meta³⁷ the decision underscores CEO Mark Zuckerberg's intention to refocus his Silicon Valley firm on what he sees as the next digital frontier: the integration of various digital realms into something termed the metaverse. At the same time, changing Facebook may help the firm separate itself from the numerous social networking difficulties it is facing, such as how it is being used to disseminate hate speech and misinformation.

A. Investment from Nike in the RTFKT Fashion Label

NIKE, INC. has taken the lead by purchasing RTFKT, a leading brand that employs cutting-edge innovation to produce next-generation collectibles that blend culture and gameplay.³⁸

The plan is to put money into the RTFKT name so that they can better serve and expand their inventive and artistic customer base, and to broaden Nike's digital reach and capabilities, accelerating Nike's digital transformation. It enables them to serve athletes and creators at the crossroads of sport, art, gaming, and culture and take a step forward into Metaverse"³⁹. Also, major tech players are entering the market, and the competition has started. Still, the current scenario of the metaverse shows very few prominent players ruling the market and creating an entry barrier to the other players needing more infrastructure.

The question now arises whether the current Competition law legislation is enough to curtail the growing competition in the metaverse to deal with the reserve market and artificial entry barrier. Will the current legislation suffice the needs of virtual reality and its market space and deal with the players to ensure fair competition and business growth? So, we need to

³⁶ Deepak Syal, 'How Will Metaverse Change the Dynamics of Business in the Future?' *The Times of India* <<https://timesofindia.indiatimes.com/blogs/voices/how-will-metaverse-change-the-dynamics-of-business-in-the-future/>> accessed 14 January 2023.

³⁷ 'The Metaverse Is the Future of Digital Connection | Meta' <<https://about.meta.com/metaverse/>> accessed 14 January 2023.

³⁸ 'Leading Fashion Brands Earn over 245 Million Dollars in NFTs Sales' <<https://fashionunited.in/news/business/leading-fashion-brands-earn-over-245-million-dollars-in-nfts-sales/2022122637778>> accessed 5 June 2023.

³⁹ 'Nike Enters Metaverse, Buys Digital Footwear Maker Rtfkt' <<https://www.cnbc18.com/technology/nike-enters-metaverse-buys-digital-footwear-maker-rtfkt-11827542.htm>> accessed 14 January 2023.

comprehend whether the growth and reach of the metaverse with a few real-life examples of companies using the metaverse to ease their business Henceforth,⁴⁰ other businesses are finding creative uses for ARAR -6.2% and VR to provide clients with the experience of trying on or testing out the products they sell. Ferrari, a manufacturer of high-end automobiles, uses augmented reality to present its models to customers, allowing them to "walk" around them and even examine their mechanical components. Using metaverse technology, companies like Chili and AniMedi can offer patients more comprehensive post-operative care and assistance. Robotic and remote surgery and immersive instruction are all being aided by the metaverse, along with tailored care in the medical profession, which is undergoing a technological transition. Signzy's VR-based onboarding technology makes it possible to open a bank account without leaving the house, reducing travel time and fees by 90% and 80%, respectively.⁴¹

The automotive industry, like other industries, will experience the metaverse in all its grandeur. As the viability of self-driving cars increases, the time spent traveling will be accessible for content consumption. Holoride is a firm that facilitates the transformation of vehicle rides into virtual reality-based amusement parks. The experience is tailored to distance, driving style, and velocity.⁴²

B. Online Clothing Trends

Many well-known brands have established physical locations in the virtual world. These fashion icons are not the first to venture into the metaverse, though; have you ever heard of Space verse? Space Runners claims that their Space verse is the first of its kind in the metaverse of clothing. The garment business is ready to fully embrace metaverse technology.⁴³ With a metaverse-based campus and a social component incorporated into its curriculum, a firm called Metaversity is redefining digital education. It tries to deliver work-based learning experiences

⁴⁰ Ecanorea, 'What Companies Use Metaverses for and Why the Big Tech Companies Are so Interested' (*Plain Concepts*, 16 November 2021) <<https://www.plainconcepts.com/metaverse-companies/>> accessed 14 January 2023.

⁴¹ 'Signzy Gets US Patent for Banking Tech in Metaverse' *The Times of India* (30 March 2022) <<https://timesofindia.indiatimes.com/city/bengaluru/signzy-gets-us-patent-for-banking-tech-in-metaverse/articleshow/90528305.cms>> accessed 14 January 2023.

⁴² 'Holoride Is an Aftermarket Solution for In-Car VR, and It Has Its Own Metaverse' <<https://www.coindesk.com/web3/2023/01/07/audi-backed-startup-holoride-is-bringing-vr-to-the-car/>> accessed 14 January 2023.

⁴³ 'Space Runners Raises \$10m to Develop Fashion Metaverse' <<https://www.fxempire.com/news/article/space-runners-raises-10m-to-develop-fashion-metaverse-926685>> accessed 14 January 2023.

directly to students' desktops, guaranteeing that they receive "actual" rather than merely textbook-based knowledge.⁴⁴

Although the industry must overcome enormous obstacles to allow the technology, the Metaverse has a promising future. The start-ups, large technology businesses, and even venture capital firms investing in the AR world today will undoubtedly, yield billionaires and trillion-dollar companies in the future.

Many of the legal concerns surrounding competition law that the metaverse may face in the future are already present, even though it may be the next phase of the internet. Companies conducting metaverse R&D should consider competition law implications in related areas, such as licensing agreements. Companies who do business in the metaverse will need to carefully consider several competition law problems, which will depend on the metaverse's future development. It's feasible that one corporation can develop a single metaverse that most users will use. If that is the case, the corporation is likely to have a dominating position and thus have a specific obligation not to misuse its market dominance. It must evaluate how its actions may affect the end user and other businesses in various ways.

It could be illegal, for example, for the dominant corporation to refuse to allow other businesses to join in the metaverse economy, withhold access to data, or favor its products and other services in the metaverse. Any alternative markets that develop within or have ties to the metaverse are another consideration for the dominating firm. The company may run a marketplace in the metaverse where users can buy and sell digital goods.

As in the case of Amazon -to establish if Amazon is unjustly favouring its businesses or suppliers that use its fulfilment services over third-party sellers, the European Commission and the UK CMA are now reviewing Amazon Marketplace. Similar problems might easily arise in the metaverse.⁴⁵

⁴⁴ 'Chandrakar - AN ANALYSIS ON LAW AND METAVERSE.Pdf' <<https://ijirl.com/wp-content/uploads/2021/12/AN-ANALYSIS-ON-LAW-AND-METAVERSE.pdf>> accessed 14 January 2023.

⁴⁵ 'Amazon and EU Reach Antitrust Agreement over Third-Party Sellers - The Verge' <<https://www.theverge.com/2022/12/20/23518569/amazon-european-union-eu-antitrust-third-party-sellers>> accessed 14 January 2023.

VIII. PROBLEMS THAT MIGHT ARISE IN ESTABLISHING A FAIR COMPETITION IN THE METAVERSE

Considering the economic interest of the metaverse, there are numerous metaverses. It is going to be more than one. After all, some platforms already claim to be metaverses (for example, Decentraland and The Sandbox; Roblox is also headed towards this direction, but not yet adding AR/VR). One of the most exciting parts of several metaverses is whether or not it will be possible to travel seamlessly across many metaverses. Imagine a user who wants to use the same avatar in both the Microsoft and Meta metaverses so they can go from a business meeting to a social gathering in the other. It's easy to imagine that consumers would prefer to use the virtual reality headset or other metaverse-specific purchases they make in any of the other metaverses they frequent. It is already the case with existing gaming platforms, as evidenced by the fact that Fortnite skins and V-bucks in-game currency are available to players on all platforms.⁴⁶ However, such frictionless data flow necessitates compatibility across metaverses. By agreeing on a unified set of modern technology specifications, metaverses may share knowledge and carry out significant discussions. It would require each metaverse corporation disclosing confidential information about how their Metaverse is supposed to work or how future metaverses should function.⁴⁷

More enterprises sharing their technological know-how can only benefit the market. To allow compatibility and address such challenges, firms participating in all aspects of the mobile phone ecosystem, from network infrastructure to chipsets to phones, collaborate to develop standards that have to be followed by each piece of equipment. However, it is often anti-competitive to disclose proprietary business information. As in the event when automakers shared data and agreed on things like AdBlue tank sizes to avoid competition on the deployment of superior, cleaner technology, the European Commission fined them more than €875 million in 2021 for conspiring on emission-related technical developments.⁴⁸

⁴⁶ Akash Takyar, 'Metaverse Use Cases and Benefits' (*Leeway Hertz - AI Development Company*, 29 December 2021) <<https://www.leewayhertz.com/metaverse-use-cases-and-benefits/>> accessed 5 June 2023.

⁴⁷ SKRINE-Tan Shi Wen, 'Collusion to Limit or Control Technological Development May Be Anti-Competitive' (*Lexology*, 26 July 2021) <<https://www.lexology.com/library/detail.aspx?g=50420470-9272-4052-b161-e4cc91ea83bc>> accessed 5 June 2023.

⁴⁸ 'Collusion to Limit or Control Technological Development May Be Anti-Competitive - Lexology' <<https://www.lexology.com/library/detail.aspx?g=50420470-9272-4052-b161-e4cc91ea83bc>> accessed 5 June 2023.

Companies operating in the metaverse need to prove that their customers will benefit from the interoperability and that they only share data that is strictly necessary to develop the required technical standards or disadvantage rival businesses. It's possible that certain metaverse businesses would fight against standardization to "lock in" customers to their system by making it the preferred choice of as many users as possible.⁴⁹

A lot of new, ground-breaking technology is being developed for use in the metaverse, and a lot of it is coming out of start-ups. Potentially successful early-stage companies in the development pipeline for the metaverse are expected to attract the attention of large metaverse companies, which may lead to acquisition offers relating to more sophisticated avatar technology or better movement tracking, for example. Even though these purchases could boost competition by extending access to cutting-edge technology, there is a risk that the buyer could utilize that technology to wipe off the competition.

Proactive regulation, as opposed to reactive competition enforcement, which some say is too late to be successful, is currently enjoying strong support in Europe.⁵⁰ The Digital Markets Act is being enacted across the European Union and will impose stricter regulatory requirements on the most popular online "gatekeeper" platforms. Laws like this could also extend to the metaverse or serve as the basis for new regulations. Competition authorities have shown an interest in digital marketplaces, as seen by various current enforcement cases in the digital arena. One such example is the CMA's probe of Apple for banning cloud gaming services from the App Store. Because of their potential reach, any effective metaverse(s) could affect competition and draw scrutiny from antitrust regulators.⁵¹ It means that metaverse businesses will perpetually have to think about competition law.

⁴⁹ Bristows LLP-Matthew Hunt, 'Competition/Antitrust in the Metaverse' (*Lexology*, 13 October 2022) <<https://www.lexology.com/library/detail.aspx?g=1fef6574-9ba4-4f3e-8682-ce78154524c2>> accessed 14 January 2023.

⁵⁰ 'EU Antitrust Officials Are Worried About Competition in the Metaverse' <<https://www.coindesk.com/policy/2022/10/19/eu-antitrust-officials-are-worried-about-competition-in-the-metaverse/>> accessed 14 January 2023.

⁵¹ 'CMA Plans Market Investigation into Mobile Browsers and Cloud Gaming' (*GOV.UK*) <<https://www.gov.uk/government/news/cma-plans-market-investigation-into-mobile-browsers-and-cloud-gaming>> accessed 5 June 2023.

IX. CRITICAL ANALYSIS

Over here, the author would like to address the competency of Metaverse in virtual reality with a critical analysis of the research conducted. Firstly, the author already clarified the relevancy of Metaverse and its definition. So, The Metaverse amalgamates all virtual worlds developed with blockchain technology. It might be virtual cities, online game applications, or NFT galleries. Now the question that arises here is the legality and its critical analysis. For that, we need to understand the grey area of the Metaverse as we know The Metaverse is constructed by the world's top digital behemoths, including Microsoft, Google, Apple, and others. The Metaverse is a modern technological realm where individuals can generate avatars, participate in events, play games, and exercise. Despite huge organizations' multiple bets on the concept, concerns about the Metaverse's security have emerged. According to experts, harassment, assault, bullying, and abusive speech are common in virtual reality (VR) and the Metaverse, and there are few simple approaches to solve the problem. Cybercrime is causing havoc worldwide, but as society evolves towards a complex digital channel, it expects to reach \$10.5 trillion by 2025. In the Metaverse, multiple challenges will come up, such as the untamed gathering of data which infringes our confidentiality, prolonged harassment, and threats, pretender avatars trying to obtain private information, pervasive security flaws, biased intelligent systems, proliferating robots and spammers addition to divisive social issues, increasing inequalities, and problems with psychological and physical health. According to the Centre for Countering Digital Hate⁵², a metaverse violation happens approximately every seven minutes in the popular virtual reality gaming VRChat.

Now the authors would like to discuss the criminal activities in the Metaverse along with case studies so that the researchers can comprehend how the Metaverse functions.

Money-transfer fraud: As awareness or use of the Metaverse develops, unscrupulous individuals could attempt to utilize it as a conduit to transmit unlawful funds, as we've seen with decentralized finance (Defi) and NFTs. Fraudsters will try to disguise the source of such

⁵² 'Center for Countering Digital Hate | CCDH' (*Center for Countering Digital Hate | CCDH*) <<https://counterhate.com/>> accessed 5 June 2023.

monies by exchanging them for metaverse-based commodities such as real estate, clothing, or native Metaverse crypto assets.

Such monies come from real-world activities or other crypto-based misdeeds. In 2021, Decentraland, Crypto voxels, The Sandbox, and Somnium Space sold about \$500 million⁵³ in digital currency assets, primarily land. This amount expects to triple by 2022. As a result, the Metaverse appears to be a more appealing destination for fraudsters looking to conduct fraud. Another concern is that unlike in the real world, where buying real estate requires mounds of documentation and solicitor-led checks, buying metaverse real estate requires simply a crypto asset address and a modest sum of money. KYC checks are rarely necessary to acquire products in metaverse markets, and this is also true for secondary markets, which occasionally allow the transfer of digital assets worth millions of pounds¹². One notable exception to this norm was Yuga Labs' Other side metaverse land release, which required potential land investors to undergo KYC checks before the property's open sale.

Protection against money- transfer fraud: Secondary markets, trades, and others can undertake regulatory checks on accounts sending/receiving payments to limit the risk of financial fraud using metaverse assets. It can assist in identifying any further money laundering dangers and ensure that any attempts to conceal tools or services are recognized. Understanding the risks connected with a single metaverse and the risks involved with multiple metaverses is critical to avoid dishonest actors attempting to "clean" money through one asset or Metaverse while hiding it elsewhere.

Scams: The influx of commercial and industrial money into the cryptocurrency market has increased fraud. It is also due to a need for more understanding about keeping money secure and recognizing symptoms of fraudulent activities. These can include giveaway fraud, in which customers are deceitfully told about a double the profit if they send money to an address, or rug pulls, in which companies collect money and disappear before making legitimate claims. Investment fraud is also included in this category. According to reports¹⁶, fraudsters robbed

⁵³ 'All You Need To Know About Crimes In Metaverse World' (<https://www.outlookindia.com/>, 8 July 2022) <<https://www.outlookindia.com/business/all-you-need-to-know-about-crimes-in-metaverse-world-news-207619>> accessed 5 June 2023.

crypto assets worth over \$14 billion in 2021. The assets are the most widely recognized and easily available commodities, particularly for persons acquainted with the ecosystem.

Case study A: Frauds involving fake airdrops and giveaways of metaverse assets are currently being observed. When the Yuga Labs team released MetaRPG and its native cryptocurrency Ape Coin (APE), in March 2022, many unscrupulous persons on social media sought to dupe users into opening unsafe links or giving money for fictitious rewards. They were able to raise \$900,000, though.

Case study B: Pixelmon, an NFT project, raised \$68 million in February 2022 through a series of auctions and a minting campaign. The venture promoted itself as a 3D online game where NFT owners could converse with the creatures. The assets were proven to be far lower quality than initially represented on the program's social networks following its introduction in late February⁵⁴. Their minimum price plummeted rapidly from 1.3 ETH to 0.3 ETH, causing several traders to accuse the company of deception. The program's designers confessed in its Discord channel that "the truth is that we were not prepared to push the art." Around the same time, 400 ETH were sent from the Pixelmon agreement to a designer's wallet, where the funds were utilized to purchase quality NFTs. Following the terrible launch, the Pixelmon Twitter account, which was still life, ceased all operations. The project's Discord channel is still up and has yet to confirm as a rug pull. However, as of this writing, \$13 million of the \$68 million gathered has been divided from the project's contract.

Case study C: A Land Voucher for property in the Matrix metaverse was acquired by an account tied by the blackmail gang REvil, a hacker organization based in Russia that was liable for the Colonial Pipeline breach. It is a license for the virtual property you may buy and build in the Matrix metaverse, not for local metaverse currency. They transferred it to a new bidder for 0.35 ETH, or about \$1,500⁵⁵, over a month after obtaining it. It is unknown why they purchased the Land Voucher or if the individual they provided it linked to them, but it does hint at permitted action by a well-known, high-profile entity in the Metaverse.

X. LEGALITY OF METAVERSE

⁵⁴ 'Decentraland Security Update' <<https://decentraland.org/blog/announcements/decentraland-security-update>> accessed 5 June 2023.

⁵⁵ 'RYUK Ransomware' <https://www.trendmicro.com/en_in/what-is/ransomware/ryuk-ransomware.html> accessed 5 June 2023.

The Metaverse technologies has met difficulties, such as the appropriation of a feminine symbol and the resale of assets for billions of dollars. However, authorities must act rapidly to guarantee that technology improvements comply with data security standards. This necessitates the construction of Metaverse laws as soon as feasible in order to allow for the growth of invention within the boundaries of the law.

Infringement of intellectual property rights: From the Metaverse's inception, the market for virtual accessories has expanded; as people's attachment to their avatars increases, they appear more willing to invest actual money in digital apparel. Because it is so easy to replicate virtual items, Metaverse has witnessed a spike in trademark infringement charges⁵⁶. Businesses are now concerned about their trademarks being used online and on physical commodities.

Competition Law: Due to the distinctive characteristics found in the Metaverse, it has been difficult to enforce anti-trust and competition laws in India. The 2002⁵⁷ Competition Act forbade a contract, combination, or conspiracy to restrict commerce, as well as monopolization and attempted monopolization. However, there are no definite regulations in India that appropriately control Metaverse, posing additional risks to its users. Authorities should intervene now, while Metaverse remains in its beginning stages before the technology develops since it will become more difficult to manage as user dependency grows. Emerging breakthroughs such as virtual reality, augmented reality, and blockchain provide possibilities for various uses, but there is still a question about how they will affect existing regulations.

XI. CONCLUSION

The ambiguity around the currency for the metaverse centres around the degree to which one can trust cryptocurrencies to serve as money and the innovation required to modify it for virtual reality. Furthermore, because virtual world users will be real-world citizens, the twin virtual and real economies will necessarily be interwoven and should not be considered as two distinct entities. As a result, a comprehensive approach should be taken while assessing what the virtual

⁵⁶ 'Intellectual Property Rights in the Metaverse - Red Points' <<https://www.redpoints.com/blog/metaverse-intellectual-property/>> accessed 5 June 2023.

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'The_competition_Act_2002.Pdf' <https://www.mca.gov.in/Ministry/actsbills/pdf/The_competition_Act_2002.pdf> accessed 6 May 2023.

economy genuinely implies for the metaverse ecosystem as a result human consumption habits in the virtual and real worlds, as well as the requirement to evaluate the global economy in both domains holistically in virtual reality.

Last but not least, tech behemoths like Apple and Google have lofty goals for the evolution of the metaverse. Our digital duplicates, or "virtual worlds," will look very different over the next few years as we integrate new technologies and develop and refine the ecosystem. Our digitalized future will be more participatory, alive, embodied, and complex now that powerful computing devices and smart wearables are readily available. However, we must overcome many obstacles before the metaverse can be fully incorporated into our everyday lives and the physical world. Since we anticipate the metaverse coexisting with our current world, we argue for a holistic strategy toward its development. Our goal was to stimulate more discussion among those interested in the metaverse by providing an in-depth analysis of recent works across various technological platforms. The fundamental issues and research agenda that will shape the future of the metaverse in the coming decades are determined by reflecting on the significant topics we covered.