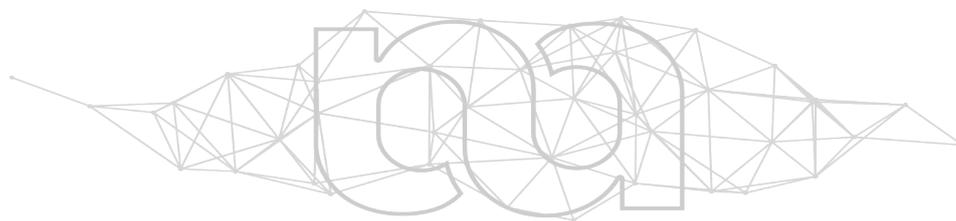
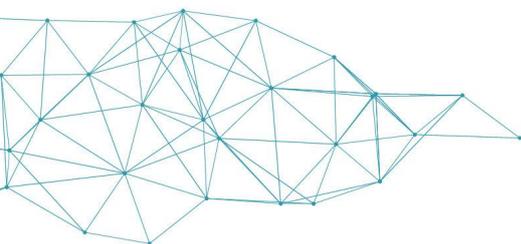


A European Regulatory Framework for the Metaverse

MetaverseUA Chair Research Paper #1

Teresa Rodríguez de las Heras Ballell
Aurelio López-Tarruella Martínez



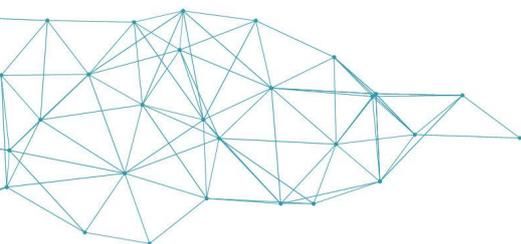
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Abstract

This Paper aims to explore whether and to which extent the current legal and regulatory framework adopted in the European Union to address the new challenges of a well-developed, still in expansion, and increasingly sophisticated digital economy apply and, if so, are suited to metaverse-related activities, markets, and actors. The analysis is focused on the scope of application and the issues addressed by the three European Digital Acts under study: the DSA (together with the P2B Regulation), the DMA, and the AI Act. It is not aimed to be an in-depth study of these Acts, but an initial assessment of their applicability, the main points of frictions, and the possible gaps or inadequacies given the features of metaverse-related activities. Besides and nonetheless the foregone, the Paper does also provide a non-exhaustive list of other issues, primarily with a private-law perspective, accompanied by some insights and reflections: legal status of avatars, personal data protection, content and behavior moderation, consumer protection, unfair commercial practices, interoperability considerations, law enforcement and dispute resolution.

Keywords: Metaverse, virtual worlds, European Union, regulation,

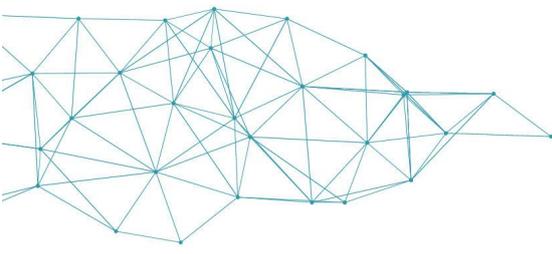
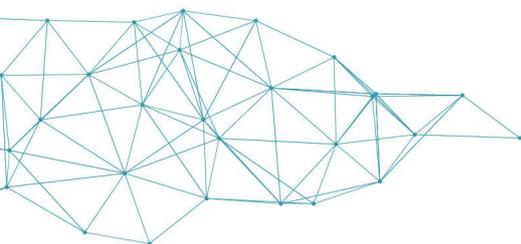


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1. Introduction

On 29 October 2021, Mark Zuckerberg, CEO of Facebook, made one of the most important announcements in his career: the change of his company's name to Meta as a sign of the commitment with the strategic change of their business activities towards the metaverse¹. While not the first in referring to the new medium, the announcement is considered a cornerstone that reflects the growing interest of companies, public authorities, and civil society towards the metaverse.

The word comes from the combination of "meta" (that transcends) and a contraction of "universe". It is considered the next Internet revolution, defined as "an immersive and constant virtual 3D world where people interact by means of an avatar to carry out a wide range of activities" on behalf of the European Parliament services²; and as "an entirely new space offering limitless possibilities and the potential to change our lives" by the Council's General Secretariat³.

While the metaverse envisaged by tech gurus does not exist yet, there are already facts and figures that demonstrate that technologies, services and applications which are now being developed will gradually bring us in the near future to something similar to it.

To start with, many companies and celebrities⁴ have built their presences in a virtual world or platform such as Roblox⁵ or Decentraland⁶ or The Sandbox. Virtual real estate sales⁷ in these worlds exceeded 1400 million USD in 2022, compared to 500 million USD in 2021⁸. Monthly active players of platforms such as Roblox⁹ or Fortnite¹⁰ reach up to 214 and 250 million respectively. Users of these platforms do not only play games but also interact with each other¹¹ – as a potential substitute to existing social networks – or attend

¹ This video can be consulted in YouTube: https://www.youtube.com/watch?v=pjNI9K1D_xo

² European Parliament Research Services, 'Metaverse: Opportunities, risks and policy implications' (2022) <[https://www.europarl.eu.eu/thinktank/en/document/EPRS_BRI\(2022\)733557/](https://www.europarl.eu.eu/thinktank/en/document/EPRS_BRI(2022)733557/)> accessed 12 November 2024.

³ Council Of The European Union, 'Metaverse – Virtual Worlds, Real Challenges' (2022) <<https://www.consilium.europa.eu/media/54987/metaverse-paper-9-march-2022.pdf>>.

⁴ Sandy Carter, 'Why Major Celebrities and Big-Name Brands Are Embracing the Metaverse' (VentureBeat, 5 March 2023) <<https://venturebeat.com/virtual/why-major-celebrities-and-big-name-brands-are-embracing-the-metaverse/>> accessed 12 November 2024.

⁵ Jessica Golden, 'Nike Teams Up with Roblox to Create a Virtual World Called Nikeland' (CNBC, 18 November 2021) <<https://www.cnbc.com/2021/11/18/nike-teams-up-with-roblox-to-create-a-virtual-world-called-nikeland-.html>> accessed 12 November 2024.

⁶ Caroline Goldstein, 'In Its Ongoing Bid to Draw Crypto-Collectors, Sotheby's Unveils a Replica of Its London H.Q. in the Blockchain World Decentraland' (Artnet, 7 June 2021) <<https://news.artnet.com/market/sothebys-decentraland-1977340>> accessed 12 November 2024.

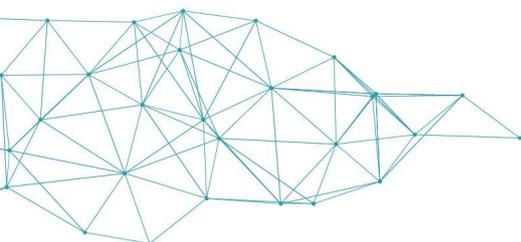
⁷ According to the World Economic Forum, "Admix, a monetization platform for AR, VR and games, has leased virtual spaces to brands like Pepsi and Formula One. According to Admix CEO Sam Huber, "Admix has pulled profits upwards of 70%". With an uncertain future of the metaverse, according to Huber, many brands are still wary about buying virtual real estate. This in return offers unique opportunities for individuals and companies to monetize on renting virtual land and spaces [World Economic Forum, 'Demystifying the Consumer Metaverse' (2023) <<https://www.weforum.org/publications/demystifying-the-consumer-metaverse/>>].

⁸ Parcel, '2022 Annual Metaverse Virtual Real Estate Report' (Parcel, 2023) <<https://parcel.so/learn/2022-annual-metaverse-virtual-real-estate-report>> accessed 12 November 2024.

⁹ David Curry, 'Roblox Revenue and Usage Statistics' (Business of Apps, 2024) <<https://www.businessofapps.com/data/roblox-statistics/>> accessed 12 November 2024.

¹⁰ Rohit Shewale, 'Fortnite Statistics 2024 (Active Players, Revenue)' (Demandsage, 2024) <<https://www.demandsage.com/fortnite-statistics/>> accessed 12 November 2024.

¹¹ Examples are VR Chat, Rec Room, or Party Royale in Fortnite.



events such as concerts¹² or fashion shows¹³. Revenues in these worlds are generated through subscription services, advertising¹⁴, or through in-game purchases of digital assets such as avatars, skins, or loop boxes¹⁵.

Besides entertainment-related environments, virtual reality (VR) augmented reality (AR)¹⁶ and other immersive technologies are being introduced in the workplace to facilitate communication and interaction among colleagues who work at a distant¹⁷. Devices with these technologies are also being used in the education sector in fields such as medicine¹⁸, architecture or engineering, or to provide better experiences for distance learning in general¹⁹. In medicine, VR has become increasingly used for therapeutic purposes including pain management²⁰, treatment of phobias and anxiety disorders²¹, or physical rehabilitation²². A milestone in the development of these devices was the launch of the Vision Pro headsets by Apple in February 2024²³. While their price might be inaccessible for many, it signals the entrance of the most highly valued company in the sector of consumer technologies in the XR devices market.

Digital twins enable companies to solve physical issues faster by detecting them sooner, predict outcomes to a much higher degree of accuracy, design and build better

¹² The Travis Scott's concert in Fortnite can be watched in YouTube: <https://youtu.be/wYeFAIVC8qU>

¹³ Decentraland, 'The Ultimate Guide to MVFW23 in Decentraland' (*Decentraland*, 23 March 2023) <<https://decentraland.org/blog/announcements/the-ultimate-guide-to-mvfw23-in-decentraland>> accessed 12 November 2024.

¹⁴ J.P. Morgan estimates in-game ad spending will reach 18.41 billiards USD by 2027 [Christine Moy and Adit Gadgil, 'Opportunities in the Metaverse: How Businesses Can Explore the Metaverse and Navigate the Hype vs Reality' (J. P. Morgan 2022) <<https://www.jpmorgan.com/content/dam/jpm/treasury-services/documents/opportunities-in-the-metaverse.pdf>>].

¹⁵ Roblox generated 591 million USD in revenue through in-game Robux sales in Q1 2021 [Martin Solomons, '150+ of The Most Interesting Roblox Statistics In 2023' (*Marketsplash*, 4 April 2023) <<https://marketsplash.com/roblox-statistics/>> accessed 12 November 2024]. Fortnite generated an estimated 20 billion U.S. dollars in annual revenues [Statista, 'Revenue generated by Fortnite worldwide from 2018 to 2022' (*Statista*, 2022) <<https://www.statista.com/statistics/1440682/fortnite-revenue/>> accessed 12 November 2024].

¹⁶ In augmented reality (AR), virtual features are added to the real environment through some sort of device (for example goggles or a smartphone) and the information presented often requires the actual location of the user. For instance, when visiting some ruins, one could see a depiction of what the site used to look like superimposed over the remains. With AR, one can also visualize a product before purchasing it—even try it on virtually—or see relevant information on the car windshield. AR also offers a huge value for companies that employ it for marketing aims. Like VR, augmenting the realism of AR technology is likely to boost its impact.

¹⁷ Applications such as Horizon Workrooms or the Apple VisionPro headsets already allow to have a conversation in a virtual (VR) or real (AR) space with another person who is physically somewhere else but whose virtual representation is in that same space, which eventually might reduce the need to travel for meetings.

¹⁸ MetaMedicsVR, 'About us' (*MetaMedicsVR*, 2024) <<https://metamedicsvr.com/>> accessed 12 November 2024; Stefano Sandrone, 'Medical Education in the Metaverse' (2022) 28 *Nature Medicine* 2456.

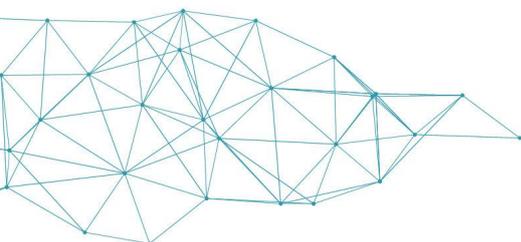
¹⁹ Marc Cortés, 'Analyses and Insights on the Potential Impact of the Metaverse on the Education Sector' (UOC's eLearning Innovation Center 2022) <https://openaccess.uoc.edu/bitstream/10609/141246/7/Metavers%20i%20sector%20educatiu%20v01_EN.pdf>

²⁰ Marta Matamala-Gomez and others, 'Immersive Virtual Reality and Virtual Embodiment for Pain Relief' (2019) 13 *Frontiers in Human Neuroscience* 279.

²¹ Daniel Freeman and others, 'Virtual Reality in the Assessment, Understanding, and Treatment of Mental Health Disorders' (2017) 47 *Psychological Medicine* 2393.

²² Mindy F. Levin, Patrice L. Weiss, and Emily A. Keshner, 'Emergence of Virtual Reality as a Tool for Upper Limb Rehabilitation: Incorporation of Motor Control and Motor Learning Principles' (2015) 95 *Physical Therapy* 415.

²³ Apple, 'Apple Vision Pro Available in the US on February 2' (*Apple Newsroom*, 8 January 2024) <<https://www.apple.com/newsroom/2024/01/apple-vision-pro-available-in-the-us-on-february-2/>> accessed 12 November 2024.



products, and, ultimately, better serve their customers²⁴. An example is Tesla: the US company creates a digital simulation of every one of its cars, using data collected from sensors on the vehicles and uploaded to the cloud. These allow the company's AI algorithms to determine where and when faults and breakdowns are most likely to occur and minimize the need for owners to take their cars to servicing stations for repairs and maintenance²⁵. This technology is also used by public administrations. The best example comes from Singapore, whose government completed the world's first digital twin of an entire nation in February 2022²⁶. The potential applications of this digital replica are vast, ranging from urban planning and transportation to emergency response and disaster management. It can be used to simulate and test different scenarios and strategies, allowing for more informed decision-making and better outcomes²⁷. Most ambitious project in this regard is probably Destination Earth, a EU-funded project that aims to build an a highly accurate digital twin of the Earth²⁸.

All in all, it is estimated that the new medium will create market opportunities estimated over 1 billion USD in yearly revenues in the coming years²⁹. Consultancy firms predict that by 2026, 25% of people will spend at least one hour a day in the metaverse for work, shopping, education, social media and/or entertainment³⁰. Certainly, the most affected part of the population would be youth, since they are already used to the experiences offered by platforms such as Roblox³¹ or Fortnite³². It is easy to assume that when elderly these groups would be more open to immersive experiences than the average adult nowadays.

While the evolution of generative artificial intelligence (AI) since the end of 2022³³ has reduced the hype for the metaverse³⁴, the gradual introduction of XR devices in our

²⁴ Deloitte, 'Industry 4.0 and the Digital Twin' (2017) <https://www2.deloitte.com/content/dam/insights/us/articles/3833-Industry4-0_digital-twin-technology/DUP_Industry-4.0_digital-twin-technology.pdf>.

²⁵ Bernard Marr, 'The Best Examples of Digital Twins Everyone Should Know About' (*Forbes*, 20 June 2022) <<https://www.forbes.com/sites/bernardmarr/2022/06/20/the-best-examples-of-digital-twins-everyone-should-know-about/?sh=4b13fc0b225f>> accessed 12 November 2024.

²⁶ George Lawton, 'How Singapore Created the First Country-Scale Digital Twin' (*VentureBeat*, 23 February 2022) <<https://venturebeat.com/business/how-singapore-created-the-first-country-scale-digital-twin/>> accessed 12 November 2024.

²⁷ Julianna Widlund, 'Singapore's First Country-Scale Digital Twin and the Future of Digital Open Data' Structures (*Insider*, 27 February 2023) <<https://www.structuresinsider.com/post/singapore-s-first-country-scale-digital-twin-and-the-future-of-digital-open-data>> accessed 12 November 2024.

²⁸ Destination Earth, 'About Destination Earth' (*Destination Earth*, 2024) <<https://destination-earth.eu/destination-earth/>> accessed 12 November 2024.

²⁹ Moy and Gadgil (n 14).

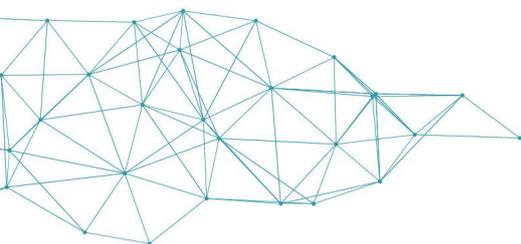
³⁰ Jackie Wiles 'What Is a Metaverse? And Should You Be Buying In?' (*Gartner*, 21 October 2022) <<https://www.gartner.com/en/articles/what-is-a-metaverse>> accessed 12 November 2024.

³¹ It is estimated that only 17% users of Roblox are above 25 years old [Jessica Clement, 'Distribution of Roblox audiences world as of December 2023, by age group' (*Statista*, 2023), <<https://www.statista.com/statistics/1190869/roblox-games-users-global-distribution-age/>> accessed 12 November 2024].

³² 62,7% of users are between 18-24 years old [Finances Online, '78 Essential Fortnite Statistics-: 2024 Users & Revenue Data' (*Finances Online*, 2024), <<https://financesonline.com/fortnite-statistics/>> accessed 12 November 2024].

³³ While the Internet is full of different tools at present time, the cornerstone of Generative AI is the launch of ChatGPT in November that year. The OpenAI application reached the 100-million users in 2 months and a half [Krystal Hu, 'ChatGPT Sets Record for Fastest-Growing User Base - Analyst Note' (*Reuters*, 2 February 2023) <<https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>> accessed 12 November 2024].

³⁴ Ed Zitron, 'RIP Metaverse' (*Business Insider*, 8 May 2023) <<https://www.businessinsider.com/metaverse-dead-obituary-facebook-mark-zuckerberg-tech-fad-ai-chatgpt-2023-5>> accessed 12 November 2024; John



lives and the blurring between the physical and virtual world seems unstoppable. Furthermore, as in previous stages of the digital revolution, technology convergence is foreseen: Generative AI will play an essential role on the development and functioning of virtual worlds³⁵. In any case, as it will be later explained, technology still needs to evolve so that these devices are more affordable, comfortable, user-friendly and with a wider offer of applications.

Despite all the benefits and opportunities, metaverse-related technologies raise important risks for persons and companies alike³⁶. In the first case, these technologies may raise unprecedented ethical questions and have adverse effects (exposure to sensitive topics, data-related and privacy issues, impact on the physical and psychological well-being, on the social standing of the participants ...), in particular for vulnerable groups, including minors³⁷. An enlargement of the digital divide, with the effect of excluding persons who lack basic skills or resources to participate in this environment, and population living in rural and remote areas due to the lack of quality and affordable access to the required technologies, has also been identified³⁸. Additionally, citizens' and consumers' rights need to be preserved in virtual worlds, where new means of interacting, advertising, commercializing products and services, and exercising rights are being introduced³⁹.

In the case of companies, the metaverse will create new market dynamics which may open new business opportunities but may also bring about new risks. Depending on how the metaverse evolves, the current incumbent big techs may expand their dominant position to the new medium, or new entrants may replace them. Either of these outcomes may raise obstacles for competitors to access the new metaverse-related markets and may discourage innovation. Recent acquisitions (Microsoft-Activision Blizzard⁴⁰), collaborations (Apple and Unity⁴¹) and judicial disputes (Epic against Apple and Google in

Naughton, 'A Moment's Silence, Please, for the Death of Mark Zuckerberg's Metaverse' (*The Guardian*, 13 May 2023) <<https://www.theguardian.com/technology/commentisfree/2023/may/13/death-of-mark-zuckerberg-metaverse-meta-facebook-virtual-reality-ai>> accessed 12 November 2024.

³⁵ Interactive Virtual Worlds Platforms are already working in this field [Daniel Sturman, 'Generative AI on Roblox: Our Vision for the Future of Creation' (*Roblox Blog*, 17 February 2023) <<https://corp.roblox.com/newsroom/2023/02/generative-ai-roblox-vision-future-creation>> accessed 12 November 2024].

³⁶ Hupont Torres and others, 'Next Generation Virtual Worlds: Societal, Technological, Economic and Policy Challenges for the EU' (European Commission, 2023) <<https://publications.jrc.ec.europa.eu/repository/handle/JRC133757>>; Council of the European Union (n 3).

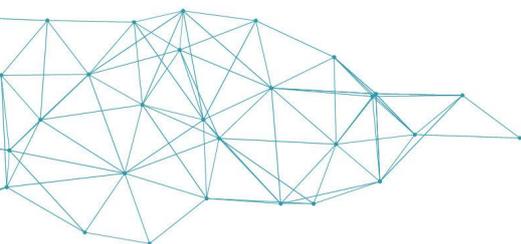
³⁷ There risks are highlighted in the European Parliament's Resolution of 17 January 2024 on virtual worlds [European Parliament, 'Resolution of 17 January 2024 on Virtual Worlds – Opportunities, Risks and Policy Implications for the Single Market' (2024) <https://www.europarl.europa.eu/doceo/document/TA-9-2024-0032_EN.html>, points 18–20]. Also in the 'Metaverse' document [Mariusz Maciejewski, 'Metaverse' (European Parliament, 2023) <[https://www.europarl.europa.eu/RegData/etudes/STUD/2023/751222/IPOL_STU\(2023\)751222_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2023/751222/IPOL_STU(2023)751222_EN.pdf)>, p. 41]. In academia, it has been highlighted that "while XR has been mostly confined to the lab, the clinic, and training/education institutions, these issues could be considered as worthy of academic and business discussion. Now that XR is about to become a tool widely used in society, they may become pressing problems" [Mel Slater and others, 'The Ethics of Realism in Virtual and Augmented Reality' (2020) 1 *Frontiers in Virtual Reality*, p. 3].

³⁸ European Parliament (n 37), point 22.

³⁹ Dai-In Danny Han, Yoy Bergs and Natasha Moorhouse, 'Virtual Reality Consumer Experience Escapes: Preparing for the Metaverse' (2022) 26 *Virtual Reality* 1443–1458.

⁴⁰ Tom Warren, 'Microsoft Completes Activision Blizzard Acquisition, Call of Duty Now Part of Xbox' (*The Verge*, 13 October 2023) <<https://www.theverge.com/2023/10/13/23791235/microsoft-activision-blizzard-acquisition-complete-finalized>> accessed 12 November 2024.

⁴¹ Unity, 'Unity's Support for Apple Vision Pro is Now in General Availability – Empowering Developers to Create Apps and Games in visionOS' (*Unity News*, 31 January 2024) <<https://investors.unity.com/news/news->



the United States⁴²) show how Web 2.0 companies and new entrants are already fighting for their position in the new metaverse-related markets.

The European Commission has also highlighted that, drawing from the lesson of the current Internet, the development of virtual worlds is also likely to pose challenges to important objectives of general public interest in a democratic society, for example in terms of disinformation, cybersecurity, cybercrime, (gender-based) cyber violence, discrimination, exclusion and hate speech. Additionally, technologies associated with the metaverse-related markets raise the issue of their environmental impact, due to increased consumption of energy by devices, data centers and telecommunication networks⁴³.

If risks that the development of the metaverse-related technologies entail want to be eradicated or at least reduced, among other measures, the regulatory framework needs to be adapted to the new technological reality⁴⁴. The question is raised at a time where the European institutions have just adopted a new set of instruments to regulate activities in the digital environment. These are the “European Digital Acts”. Despite their recent adoption, such Acts were proposed at a time where the potential of immersive technologies and virtual worlds was not envisaged neither by the industry nor by the legislator, but they may have an impact on the development of metaverse-related markets as this Paper explores and discusses.

In particular, Regulation 2022/2065 (Digital Services Act, or DSA)⁴⁵ marks an important turning point in Europe's regulatory strategy for the digital economy. With its adoption, the DSA completes the regulatory tandem with the Regulation 2022/1925 (Digital Markets Act, or DMA)⁴⁶ with which the EU is approaching the profound transformation of digital markets in recent decades and is part of a profusely growing and increasingly dense legislative and regulatory environment for the digital economy, which includes legal texts on cybersecurity, cloud computing, data and digital assets (crypto assets). Another instrument that will have an impact on the development of immersive technologies and virtual worlds is the Artificial Intelligence Act (AIA)⁴⁷ although it will not be applicable until the second half of 2026⁴⁸.

[details/2024/Unitys-Support-for-Apple-Vision-Pro-is-Now-in-General-Availability--Empowering-Developers-to-Create-Apps-and-Games-in-visionOS/default.aspx](#)> accessed 12 November 2024.

⁴² Adi Robertson, ‘Epic v. Google: Everything We’re Learning Live in Fortnite Court’ (*The Verge*, 19 December 2023) <<https://www.theverge.com/23945184/epic-v-google-fortnite-play-store-antitrust-trial-updates>> accessed 12 November 2024; Adi Robertson, ‘A Comprehensive Breakdown of the Epic v. Apple Ruling’ (*The Verge*, 12 September 2021) <<https://www.theverge.com/2021/9/12/22667694/epic-v-apple-trial-fortnite-judge-yvonne-gonzalez-rogers-final-ruling-injunction-breakdown>> accessed 12 November 2024.

⁴³ European Commission, ‘An EU Initiative on Web 4.0 and Virtual Worlds: A Head Start in the Next Technological Transition’ (2023) COM(2023) 442 FINAL, p. 3.

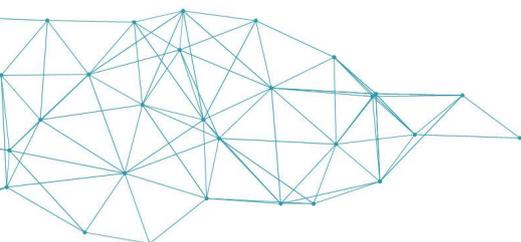
⁴⁴ For the World Economic Forum “*advancements in governance and regulation (including IP right management) to enable fair value distribution and a sustainable creator economy is a prerequisite for an impactful metaverse mass adoption*” [World Economic Forum (n 7), p. 26]. But this will surely not be enough to fully eradicate those challenges: measures in the field of education, research and social awareness would need to be adopted as well.

⁴⁵ Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act) [2022] OJ L 277 (from now on, “DSA”).

⁴⁶ Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on Contestable and Fair Markets in the Digital Sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) [2022] OJ L 265 (from now on, “DMA”).

⁴⁷ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) [2024] OJ L (from now on, “AI Act”).

⁴⁸ Art. 113 AI Act: 24 months after the entering into force of the Regulation.



When asked about the suitability of the existing legal framework to regulate the metaverse by a Member of the European Parliament, T. Breton, Commissioner for the Internal Market, answered that the DSA and DMA “provide the appropriate framework and the necessary tools to tackle issues concerning metaverse”, and that they did not have the “intention to launch a specific study into the functioning of the metaverse” in the short term⁴⁹.

Nonetheless, a few months later, Ursula von der Leyen announced in her State of the Union speech of September 2022, that one of the key new initiatives for 2023 as part of the Commission’s “Europe fit for the digital age” priority would be an “initiative on virtual worlds, such as the metaverse”⁵⁰. Such Initiative was published in July 2023⁵¹. The Communication traces and establishes thereby the European vision and strategy in the field: “a Web 4.0 and virtual worlds that reflect EU values and principles and fundamental rights, where people can be safe, confident and empowered, where people’s rights as users, consumers, workers or creators are respected, and where European businesses can develop world-leading applications, scale up and grow”⁵². The Commission also affirms that “the EU has a robust, future-oriented legislative framework that already applies to several aspects of the development of virtual worlds and Web 4.0”, and that guarantees “the protection and enforcement of the rights of individuals and companies operating in virtual worlds”. The Commission aspires to achieve a Web 4.0 “that is powered by open and highly distributed technologies and standards that enable interoperability between platforms and networks and freedom of choice for users”⁵³. Surprisingly enough, the Communication prefers to use the terms “Web 4.0”, “spatial computing” or “virtual worlds” instead of “metaverse”. The decision might be grounded in the need to avoid the use of a term that might be connected with a particular company, but it needs to be acknowledged that “metaverse” is a term with a long history and that is widely used in other countries. It was affirmed that the European Commission should have taken these elements into consideration having in mind the need to work with other jurisdiction in the adoption of common standards⁵⁴.

⁴⁹ European Parliament, ‘E-000656/2022: Metaverse Regulation’ (2022) <https://www.europarl.europa.eu/doceo/document/E-9-2022-000656-ASW_EN.html>

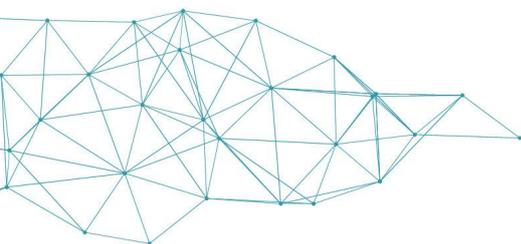
⁵⁰ The speech is available at: European Commission, ‘State of the Union 2022: Letter of Intent’ (2022) <https://state-of-the-union.ec.europa.eu/system/files/2022-09/SOTEU_2022_Letter_of_Intent_EN_0.pdf>. Following it, the initiative was reflected in the Commission Work Programme 2023, with the following words: “we will propose tools on developing open human-centric virtual worlds, such as metaverses. These provide a myriad of possibilities for industries and service sectors, the creative arts and citizens, as well as opportunities to address broader social challenges such as health and smart cities” [European Commission, ‘Commission Work Programme 2023 – A Union Standing Firm and United’ (2022) COM(2022) 845 final <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0548>>, p. 7].

⁵¹ European Commission (n 43). The communication is accompanied by the Commission Staff Working Document [European Commission, ‘Commission Staff Working Document- An EU initiative on Web 4.0 and virtual worlds: a head start in the next technological transition’ (2023) SWD(2023)250 FINAL].

⁵² European Commission (n 43), p. 4.

⁵³ *ibid*, p. 5.

⁵⁴ Derek Robertson, “Europe’s Agenda for... Not ‘The Metaverse’” (*POLITICO*, 11 July 2023) <<https://www.politico.com/newsletters/digital-future-daily/2023/07/11/europes-agenda-for-not-the-metaverse-00105730>> accessed 12 November 2024; Anselm Küsters, ‘A Tale of Two Metaverses: Assessing the EU’s Influence on Standard-Setting in Virtual Worlds’ (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*.



Such terminology is endorsed by the European Parliament in two resolutions adopted on January 2024⁵⁵ that recall the need of virtual worlds accessible in the EU to respect ethical values, principles and fundamental rights enshrined in the Charter of Fundamental Rights of the European Union and existing EU legislation. The resolutions also underline the key importance of promoting standardization and interoperability for the full development of an ecosystem of interconnected virtual worlds; and that they should be developed and deployed in line with the general principle that what is illegal offline should be illegal online, ensuring that people's rights, with a strong focus on children, as users, consumers, workers, investors, rights holders and creators are fully respected⁵⁶.

Against such a backdrop, this Paper aims to analyze whether the existing legal framework in the European Union (in particular, the European Digital Acts) are applicable to metaverse-related activities and markets and suited to ensure their responsible development – i.e. a legal and regulatory framework that guarantees that risks for users and companies alike are adequately tackled, and provide the legal certainty digital entrepreneurs need to develop new technologies, innovative business models and to expand their business activities to the new medium.

To that end, having in mind the conceptual challenge caused by the variety of terms used in the Commission's Initiative, section 2 will start by proposing and trying to formulate a common definition of the metaverse for the purposes of the subsequent legal analysis. In our opinion, two definitions can be identified and considered: a broad one, equivalent to the Commission's concept of "Web 4.0"; and a strict one, equivalent to that of "virtual worlds". This Paper focuses on the narrower and strictest notion that the term of "virtual worlds" describes. The second part of section 2 will identify the features of the phenomenon with are more relevant from a legal point of view.

Certainly, a legal framework for the metaverse encompasses many fields of law. In section 3 we will provide a non-exhaustive list of legal and regulatory questions that the new medium raises including the quest for openness and interoperability; the legal status of avatars and digital identity; the concerns for privacy and personal data protection; the deployment of content and behavior moderation mechanisms and policies in virtual worlds; the need to ensure consumer protection (including unfair commercial practices); the regulation of marketplaces in virtual worlds; questions related to law enforcement and dispute resolution; and intellectual property matters. At first sight, the Commission's assertion that "the EU has a robust, future-oriented legislative framework that already applies to several aspects of the development of virtual worlds and Web 4.0" seems plausible. However, as the European Parliament's resolutions of January 2024 warns, certain issues may require further study.

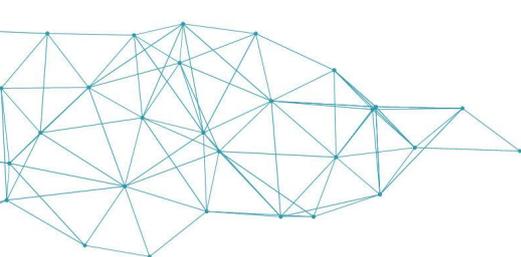
Finally, section 4 is dedicated to the European Digital Acts which in our opinion will have a deeper impact on the regulation of the metaverse⁵⁷: the DSA, the DMA and the AI Act.

It is our understanding that neither the Data Governance Act nor the Data Act will have such a significant impact on the development of the metaverse, although they might be indirectly applicable to metaverse-related activities in certain cases and under some

⁵⁵ European Parliament (n 37), point 2; European Parliament, 'Resolution of 17 January 2024 on policy implications of the development of virtual worlds – civil, company, commercial and intellectual property law issues' (2024) C/2024/5720 <<http://data.europa.eu/eli/C/2024/5720/oj>>, point 2.

⁵⁶ European Parliament (n 55), points 3-5.

⁵⁷ The paper will not deal with the so-called Data Governance Act [Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European Data Governance and amending Regulation (EU) 2018/1724 (Data Governance Act) [2022] OJ L 151/1 (from now on, "DGA")], due to the fact that, to our understanding, its metaverse-related implications will be lower.



conditions. Broadly speaking, this is so because the most important players in the metaverse, the interactive virtual worlds platforms (IVWP), cannot be considered neither “data intermediation service providers” in the sense of art. 2 (11) DGA⁵⁸, nor a “data processing service provider” in accordance with art. 2 (8) Data Act⁵⁹. Additionally, while XR devices might be considered a “connected product” in accordance to art. 2 (5) of this latter instrument⁶⁰, it seems to us that such regulation focuses in IoT devices. Therefore, these two acts on data will not be, in our opinion, so decisive and instrumental in defining and governing how the metaverse shapes and evolves. In any case, some further clarification in this regard from the regulator is certainly needed.

The work will culminate with some final findings and conclusions which cannot be but provisional since, as it will be explained, at present it is difficult to predict how technology will evolve, and which business models will succeed in the future of the metaverse.

2. The metaverse and its main features from a legal perspective

There are several definitions of the metaverse⁶¹. They vary depending on what aspects of the phenomenon are more relevant for their authors. A good starting point is the definition provided by Matthew Ball: “[a] massively scaled and interoperable network of real-time rendered 3D virtual worlds that can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payments”⁶². This is the definition that highlights those aspects of the metaverse which have stronger implications from a legal point of view. However, two precisions need to be made.

First, Ball’s definition focuses on interconnected virtual worlds, but attention also needs to be paid to the interconnection between physical and digital realities facilitated by

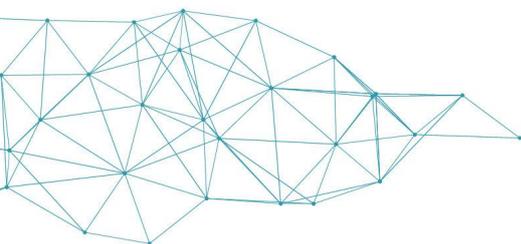
⁵⁸ Art. 2(11) DGA: “‘data intermediation service’ means a service which aims to establish commercial relationships for the purposes of data sharing between an undetermined number of data subjects and data holders on the one hand and data users on the other, through technical, legal or other means, including for the purpose of exercising the rights of data subjects in relation to personal data, excluding at least the following: (a) services that obtain data from data holders and aggregate, enrich or transform the data for the purpose of adding substantial value to it and license the use of the resulting data to data users, without establishing a commercial relationship between data holders and data users; (b) services that focus on the intermediation of copyright-protected content; (c) services that are exclusively used by one data holder in order to enable the use of the data held by that data holder, or that are used by multiple legal persons in a closed group, including supplier or customer relationships or collaborations established by contract, in particular those that have as a main objective to ensure the functionalities of objects and devices connected to the Internet of Things; (d) data sharing services offered by public sector bodies that do not aim to establish commercial relationships”.

⁵⁹ Art. 2 (8) DGA: “‘data processing service’ means a digital service that is provided to a customer and that enables ubiquitous and on-demand network access to a shared pool of configurable, scalable and elastic computing resources of a centralized, distributed or highly distributed nature that can be rapidly provisioned and released with minimal management effort or service provider interaction”.

⁶⁰ Art. 2 (5) DGA: “‘connected product’ means an item that obtains, generates or collects data concerning its use or environment and that is able to communicate product data via an electronic communications service, physical connection or on-device access, and whose primary function is not the storing, processing or transmission of data on behalf of any party other than the user”.

⁶¹ Georg David Ritterbusch and Maite Rolf Teichmann, ‘Defining the Metaverse: A Systematic Literature Review’ (2023) 11 IEEE Access 12368-77.

⁶² Matthew Ball, *The Metaverse – And How It Will Revolutionize Everything* (Liveright Publishing Corp 2022), p. 28.



immersive technologies⁶³. The boundaries of both realities will be blurred: we will be able to easily transcend from one to the other, or to combine both. This refers to the possibilities of combining real and digital images and sounds, but also other senses such as haptic. This is another essential element of the metaverse which makes it more difficult to define and that reflects the fact that further development of immersive technologies is necessary⁶⁴. It also captures other aspects which may have legal implications and which are not covered by the previous definition – e. g. question concerning the collection of very sensitive personal data by VR/AR headsets, haptic devices or brain-computer interfaces (BCI), or the regulation of new marketing techniques specially created for these artifacts.

As previously mentioned, there are a narrow and a wide definition of the Metaverse. The first one corresponds to Ball's definition, and it is aligned with the concept of "virtual worlds" that the European Commission uses in its "Web 4.0 Initiative": *Virtual worlds are persistent, immersive environments, based on technologies including 3D and extended reality (XR), which make it possible to blend physical and digital worlds in real-time, for a variety of purposes such as designing, making simulations, collaborating, learning, socialising, carrying out transactions or providing entertainment*⁶⁵.

The second, which would include the previously mentioned features, is referred to by the Commission as *Web 4.0: the expected fourth generation of the World Wide Web. Using advanced artificial and ambient intelligence, the internet of things, trusted blockchain transactions, virtual worlds and XR capabilities, digital and real objects and environments are fully integrated and communicate with each other, enabling truly intuitive, immersive experiences, seamlessly blending the physical and digital worlds*⁶⁶.

As previously mentioned, the omission to the term "metaverse" in the Initiative can be criticized for not being aligned with a terminology that is accepted in academia, literature and lawmaking in other jurisdictions. However, the distinction between the narrow (virtual worlds or metaverses) and wide (Web 4.0 or Metaverse) is plausible because it helps to identify to what aspects each piece of legislation refers to.

Second, contrary to other authors⁶⁷, M. Ball does not see blockchain and Web3 as an indispensable feature of the metaverse. We agree. Certainly, a widespread use of blockchain technologies would help to create a decentralized interoperable Metaverse, thus hopefully reducing the problems inherent to so-called platformization – e. g. the control of our identities, digital assets and payment mechanisms by a few centralized digital platforms⁶⁸. The promise is that distributed ledger technologies will allow us to act with a single identity in the metaverse fully controlled by us, and to actually own the digital assets we hold in virtual worlds, with the possibility of bringing them with us (porting them) when we visit other worlds. However, for the time being we do not know how the metaverse will evolve⁶⁹: it is possible to imagine a metaverse controlled by a single company or, most

⁶³ Other definitions such as that of Gatner adequately highlights this feature.

⁶⁴ World Economic Forum, 'Interoperability in the Metaverse' (2023) <<https://www.weforum.org/publications/interoperability-in-the-metaverse/>>

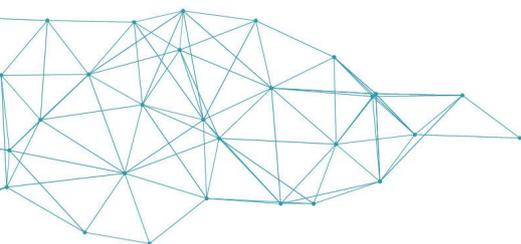
⁶⁵ European Commission (n 43), p. 2.

⁶⁶ *Ibid.*, p. 2.

⁶⁷ Luis Ignacio Vicente del Olmo and others, 'Historia del metaverso' en Luis Ignacio Vicente del Olmo y José Luis Amat (coords), *Aspectos jurídicos del metaverso* (La Ley 2022) 25-67, p. 35; Jon M Garon, 'Legal Implications of a Ubiquitous Metaverse and a Web3 Future' (2022) SSRN.

⁶⁸ Ignas Kalpokas and Julia Kalpokiene, *Regulating the Metaverse: A Critical Assessment* (Routledge 2023), p. 35; Thien Huynh-The and others, 'Blockchain for the Metaverse: A Review' (2023) 143 *Future Generation Computer Systems* 401-419.

⁶⁹ Andrés Guadamuz, 'Looking for a Model of the Metaverse' (*Technollama*, 2023) <<https://www.technollama.co.uk/looking-for-a-model-of-the-metaverse>> accessed 12 November 2024; Renaissance Numérique, *Gouverner le Métavers et l'internet de demain* (2023),



probable, a new medium where decentralized virtual worlds – e. g. Decentraland – coexist with centralized ones – e. g. Roblox or Horizon Worlds – and where interoperability is limited⁷⁰. Additionally, projects led by private entities, although being more prominent and frequent, share the market with government-supported ones⁷¹.

Following M. Ball's definition, we identify four attributes as essential to talk about the metaverse: immersiveness, interoperability, synchronicity and persistence. Certainly, existing virtual worlds do not yet meet all of these attributes, but if technology keeps developing at the same speed, we can envisage such a Metaverse emerging in the near future if the regulatory framework facilitates it.

To analyze the challenges that may appear for the adoption of a regulatory framework of the metaverse that ensure an adequate protection of our rights and do not create obstacles to pursue economic activities, it is also important to identify the addressees of such regulations: its main players. In our opinion, these are the *providers of the infrastructure* (hardware and software) that supports the Metaverse as a new "space"; the *platforms*, also known as *interactive virtual world platforms (IVWP)* or *metaverses*, that host virtual worlds and provide services to their users; the *developers* of virtual worlds and contents; and the *users*, who will identify themselves in the metaverse with avatars.

2.1. Attributes of the metaverse: immersiveness, interoperability, synchronicity and persistence

To our understanding, the metaverse is characterized by its immersiveness, interoperability, synchronicity and persistence. This section is aimed to briefly explain each one of these attributes.

2.1.1 Immersiveness

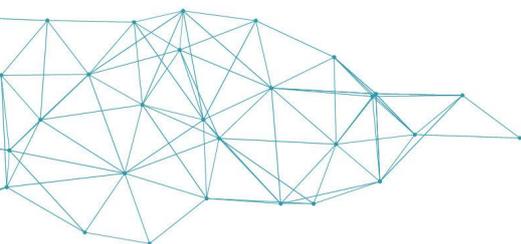
For a digitally generated world to be considered "virtual" it must give the impression to users that they are not just looking at it, but they are part of it, thus, they are immersed in the world⁷². 3D is considered a prerequisite to achieve immersiveness or, as other authors

<<https://www.renaissancenumerique.org/publications/gouverner-le-metavers/>>, accessed 12 November 2024.

⁷⁰ As foreseen in legal literature [Ball (n 62); Kalpokas and Kalpokiene (n 68)].

⁷¹ An illustrative example is Metaverse Seoul. This initiative of a virtual municipal world has already started its service phase with completing the test of various administrative services such as economy, education, and tax affairs [Seoul Metropolitan Government, 'Official Release of Metaverse Seoul' (Seoul, 2023) <<https://english.seoul.go.kr/official-release-of-metaverse-seoul/>> accessed 12 November 2024; Metaverse Seoul, 'Official Website' (Metaverse Seoul, 2023) <<https://metaverseseoul.kr/user/>> accessed 12 November 2024]. The previously cited Virtual Singapore (city-state digital twin) set the scene for the project to transition towards [Lawton (n 26)]. China is also promoting state-backed metaverse platform [DW Team, 'Nanjing Launches Chinese Metaverse Platform' (Digital Watch Observatory, 2023) <<https://dig.watch/updates/nanjing-launches-chinese-metaverse-platform>> accessed 12 November 2024].

⁷² According to De Filippi, "the metaverse is often compared to the internet as both are virtual environments populated by digital agents interacting with one another from all over the world. However, there are some key differences. First and foremost, the metaverse offers a more immersive and interactive experience than the internet because it enables people to interact in a new spatial environment. Interactions can happen in a variety of ways, including chatting and playing games. But there's also dancing and moving around in this new virtual space, in ways that were not possible before in the de-spatialized territory of the internet. Second, the metaverse is a place where people are not limited to reading or publishing content, (e.g. social media posts, online videos or



say, to provide users a feeling of *co-presence*. Certainly, there are degrees of immersiveness: it depends particularly on the quality of the software (the game engine) used to render the virtual world or to create the experience (e. g. feeling of physical presence using VR headsets), the limitations of the networks used to transmit the information, and of the device that is used to access it. Nowadays, virtual worlds may be accessed using VR/AR headsets, mobile devices or PCs⁷³. But for the metaverse to really become the next stage of the Internet evolution, mass adoption of immersive technologies would be necessary. Those technologies providing a higher degree of immersiveness will succeed, while the rest will gradually be abandoned. This would need a drastic reduction of prices of immersive technologies. If not, a new digital divide may appear.

2.1.2 Interoperability

Simply put, interoperability refers to the ability of computer systems or software to exchange and make use of information sent from one another. An interoperable metaverse would mean that users have the ability to tele-transport (port) their avatars from one virtual world to another using “portals” that will act as hyperlinks in the World Wide Web. Users would not need to use a different identity and a different avatar in every world they visit⁷⁴, even if this requires the avatar to adopt a different format in each virtual world⁷⁵. It would also mean that users will have a feeling of *continuity*: they will be able to take virtual content such as a backpacks or skins with them (in a digital wallet) to other virtual worlds and sell it, change it or remix it with other goods⁷⁶, or to use the same payment system (e. g. a cryptocurrency). Interoperability also refers to the underlying technology that supports these virtual worlds: users should be able to access these worlds or AR/VR experiences using any kind of computer, device or console, regardless of the operating system installed in them.

At present, an interoperable metaverse does not exist. To achieve it, the establishment of common standards (common systems for presenting information) is needed. This was easy with Internet due to the fact it was conceived by research institutions with openness in mind. However, the metaverse is emerging at a time where Internet is dominated by a few tech giants (Google, Meta, Apple, etc...) who have spent the past decade closing their ecosystems. Those companies are trying to expand their dominant positions in Web 2.0 to the Metaverse⁷⁷. Additionally, platforms of virtual worlds

interactive web pages): they also have the opportunity to interact with digital objects and infrastructures. Again, this is something that was inconceivable using the pre-metaverse internet due to its lack of spatiality” [P De Filippi, ‘Blockchain Technology as a Means to Create Virtual Property in the Metaverse’ (The OECD Forum Network, 2022) <<https://www.oecd-forum.org/posts/blockchain-technology-as-a-means-to-create-virtual-property-in-the-metaverse>> accessed 12 July 2024].

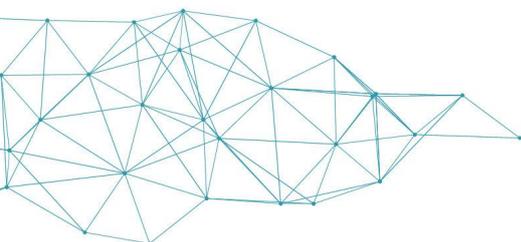
⁷³ As Ball states “arguing that immersive VR is a requirement for the metaverse is similar to arguing that the mobile internet can only be accessed by apps, thereby excluding mobile browsers” [Ball (n 62), p. 35].

⁷⁴ An example is Ready Player Me, a platform that allows you to create an avatar that can be used in several virtual world platforms [RPM Team, ‘Create an Avatar for the Metaverse’ (Ready Player Me, 2024) <<https://readyplayer.me/es>> accessed 12 November 2024].

⁷⁵ World Economic Forum, ‘Metaverse Identity: Defining the Self in a Blended Reality’ (2024) <<https://www.weforum.org/publications/metaverse-identity-defining-the-self-in-a-blended-reality/>>

⁷⁶ Ball (n 62), p. 37.

⁷⁷ Take Apple and Google as an example. They have a dominant position in app stores of mobile devices thanks to Google Play (in the case of Android devices) or the AppStore (in the case of iOS devices). This means that, in practice, apps cannot be directly downloaded from the Internet, but through the app stores. As a consequence,



have evolved using their own different rendering engines, and saving their objects, textures, and player data into entirely different file formats and without a system through which to even try to share data to other virtual worlds. Today's virtual worlds and their builders never designed their systems or experiences to be interoperable. Instead, they were intended to be closed experiences with controlled economies – and optimized accordingly⁷⁸. An additional challenge is the fact that stakeholders with interest in the interoperable metaverse debate has increased: it also includes console makers (xBox, Playstation, Nintendo), game developers (Epic, Action Blizzard, Art Entertainment), game engines (Epic Unreal, Unity, etc) or AR/VR device makers (Meta, Microsoft, ByteDance, etc). Consensus to be reached for the adoption of common standards has thus increased in difficulty.

With this situation in mind, some authors argue that it is unlikely that a fully interoperable metaverse will ever happen. Instead, there will be many competing networks of virtual worlds: a bunch of isolated experiences and spaces that are challenging to access and move between, and objects that disappear along the way. Nevertheless, it is possible to identify certain elements of optimism⁷⁹.

First, Internet-related organizations has created working groups to promote metaverse-related standards. This is the case of the Institute of Electrical and Electronic Engineers (IEEE)⁸⁰, and the Metaverse Interoperability Community Group of the World Wide Web Consortium (W3C)⁸¹. WebXR Device API is an example of a standard sponsored by this institution: it describes support for accessing augmented reality and virtual reality devices, in a web browser⁸². Additionally, metaverse-specific organizations have appeared: the Open Metaverse Alliance for Web3 (OMA3)⁸³ and the Metaverse Standard Forum are the best examples. The latter “provides a venue for cooperation between standards organizations and companies to foster the development of interoperability standards for an open and inclusive metaverse, and accelerate their development and deployment through pragmatic, action-based projects”⁸⁴.

Second, *de facto* standards may appear thanks to the widespread use of proprietary technologies. An example is the use of our Facebook or Google accounts to connect to third party's services thus creating a sort of a single identity to interact in Web 2.0. Epic's Unreal and Unity (of Unity Technologies) game engines are widely used by virtual world platforms, digital twin developers or even movie studios⁸⁵. This facilitates standardization⁸⁶. However, the fact these technologies are proprietary may become

access to metaverse-related apps with mobile devices is thus, dependent on them. This gives the two big techs a privilege position to control access to the Metaverse and to impose their standards.

⁷⁸ Ball (n 62), p. 121.

⁷⁹ A “multiverse of madness” in the words of Guadamuz [Guadamuz (n 68)].

⁸⁰ Institute of Electrical and Electronic Engineers, ‘Why Are Standards Important for the Metaverse?’ (IEEE SA, 2022) <<https://standards.ieee.org/beyond-standards/industry/technology-industry/why-are-standards-important-for-the-metaverse/>> accessed 12 November 2024.

⁸¹ World Wide Web Consortium, ‘Metaverse Interoperability Community Group’ (W3, 2022) <<https://www.w3.org/community/metaverse-interop/>> accessed 12 November 2024.

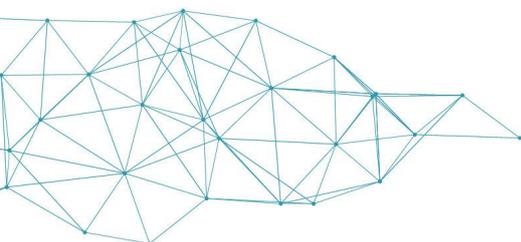
⁸² World Wide Web Consortium, ‘WebXR Device API – W3C Candidate Recommendation Draft’ (W3, 16 April 2024) <<https://www.w3.org/TR/webxr/Overview.html>> accessed 12 November 2024.

⁸³ <https://www.oma3.org>

⁸⁴ <https://metaverse-standards.org>

⁸⁵ Jeff Farris, ‘Forging New Paths for Filmmakers on *The Mandalorian*’ (Unreal Engine, 20 February 2020) <<https://www.unrealengine.com/en-US/blog/forging-new-paths-for-filmmakers-on-the-mandalorian>> accessed 12 November 2024.

⁸⁶ An example of the benefits of standardization is Ready Player Me, which allows you to create a single avatar to be used in multiple platforms of virtual worlds [Dean Takahashi, ‘Ready Player Me Raises \$56M for Metaverse



problematic because of the dominant position their owners could gain in the new medium⁸⁷.

Third, as previously mentioned, blockchain technologies may constitute an essential (but not decisive or indispensable) element of the Metaverse infrastructure. One of the reasons is that it facilitates interoperability⁸⁸. When the identity of a user, the ownership of digital assets or his/her payment mechanism is managed with blockchain-supported technology and not by a centralized platform, the user has full control. Thus, at first sight, he/she can use it in any other virtual worlds that is based on the same technology. Nevertheless, the use of blockchain is still subject to important challenges⁸⁹, and it is not enough by itself to ensure interoperability. In this latest regard, it should be recalled that interoperability is required in relation to many other aspects such as, for instance, the format of exchanged data where data normalization and standardization are crucial.

Fourth, the open-source software movement should not be underestimated. It already plays an important role in other technologies that are contributory or adjacent to the metaverse such as generative artificial intelligence (e. g. Stable Diffusion). The Linux Foundation launched its Metaverse Open Foundation with “a mission to provide a collaboration space for diverse industries to work on developing open-source software and standards for an inclusive, global, vendor-neutral and scalable Metaverse”⁹⁰. A platform such as GitHub already has repositories on the topic⁹¹. Initiatives based on open standards and collaborative projects have also emerged from private companies such as Nvidia’s Omniverse⁹².

Fifth, according to some authors⁹³, the driving force leading efforts towards enhanced interoperability might be of an economic character. Centralized platforms can favor standardization and interoperability if they foresee more benefits in opening their

Avatars’ (Venturebeat, 23 August 2022) <<https://venturebeat.com/games/ready-player-me-raises-56m-for-metaverse-avatars/>> accessed 12 November 2024].

⁸⁷ Andreas Jungherr and Damien B. Schlarb, ‘The Extended Reach of Game Engine Companies: How Companies Like Epic Games and Unity Technologies Provide Platforms for Extended Reality Applications and the Metaverse’ (2022) 8(2) Social Media + Society.

⁸⁸ According to De Filippi, “the metaverse purports to become the main place where people come together and exchange digital goods or services, it needs to provide a certain degree of interoperability. And interoperability in the metaverse is not limited to the realm of online communications: it also includes the realm of digital assets, with the important requirement to be able to transfer digital goods from one corner of the metaverse to the other. However, this type of interoperability requires digital objects to exist outside of the virtual worlds on which they have been acquired. This is precisely where blockchain technology comes to the rescue, providing a decentralised infrastructure to tokenise digital assets as NFTs, thereby allowing for users to transact these assets directly to one another without going through a central server” [De Filippi (n 72)].

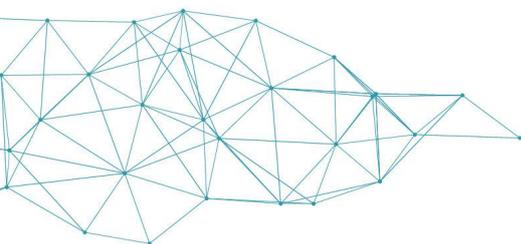
⁸⁹ Nowadays blockchain-supported games or application may encounter limitations imposed in particular by providers of operating system and app stores of mobile devices – i.e., Apple and Google. Digital assets represented in NFTs are not stored in the blockchain, but in traditional servers which are usually under the control of a centralized platform [ibid.].

⁹⁰ Linux Foundation, ‘Linux Foundation Announces Launch of the Open Metaverse Foundation’ (Linux Foundation, 18 January 2023) <<https://www.linuxfoundation.org/press/open-metaverse-foundation>> accessed 12 November 2024.

⁹¹ <https://github.com/mvs-org>

⁹² Nvidia’s Omniverse enables companies to build and collaborate in shared virtual simulations built upon 3D assets and environments from different file formats, engines, and other rendering solutions. Omniverse is based on open Universal Scene Description (USD) standard for interoperable 3D assets [Dean Takahashi, ‘Nvidia Launches Omniverse Cloud Services in 100 Countries to Power the Metaverse’ (Venturebeat, 20 September 2022) <<https://venturebeat.com/games/nvidia-launches-omniverse-cloud-services-in-100-countries-to-power-the-metaverse/>> accessed 12 November 2024].

⁹³ Vicente del Olmo and others (n 67), p. 62; Ball (n 62), p.104.



platforms that in keeping them closed. Examples from the past show that openness may be more profitable than business models based on closed platforms⁹⁴. Openness may facilitate greater consumer engagement: users might be willing to spend more money in digital goods that can be used in several metaverses, than in digital goods that can only be used in one platform. It also provides efficiencies and cost saving to content developers: they may produce and commercialize digital assets or services in a wider market across multiple platforms. This may also benefit platforms because their offers in terms of virtual worlds, contents and services would increase making them more attractive to potential users. New market opportunities may thus appear thanks to openness and interoperability⁹⁵. Meta's announcement of April 2024 regarding the opening up of the Meta Quest operating system, Meta Horizon OS, to third-party hardware makers is an example in that direction⁹⁶.

Sixth, while standards may be imposed by the legislator, this seldom happens when the final purpose is interoperability. However, as previously mentioned, the European Commission "aims for a Web 4.0 that is powered by open and highly distributed technologies and standards that enable interoperability between platforms and networks and freedom of choice for users"⁹⁷. Thus, regulatory measures to achieve these objectives may be expected to be adopted. In particular, as later explained, the Digital Market Act (DMA) can play an important role in this regard. In any case, legislators should ensure that the adoption of common standards does not compromise privacy, security and safety needs (in particular, the protection of vulnerable groups), and that they ensure that metaverse activities are conducted in a lawful and fair manner across jurisdictions⁹⁸.

2.1.3 Synchronicity and persistence

Virtual worlds share many features with video games: 3D format is one of them, and, in many cases, also synchronicity. Persistence, however, is exclusive of virtual worlds. In the virtual worlds, a person, making use of his/her avatar, can interact with his/her friends, colleagues, third parties or AI-generated avatars (an evolved version of NPC or "non-playable characters" in video games). The number of persons that can participate in a virtual world should be "effectively unlimited", thus they can be physically located in any part of the world. Synchronicity implies that any action taken by an avatar in a virtual world should be instantly perceived by anyone else visiting that world. Additionally, the effects that such action has in the virtual world should persist once the user abandons it. In fact, it might be the case that while the user leaves the virtual world, his/her avatar keeps interacting with others guided by an algorithm of the virtual world trained with data of the avatar's behavior⁹⁹.

⁹⁴ *ibid.*, p. 104.

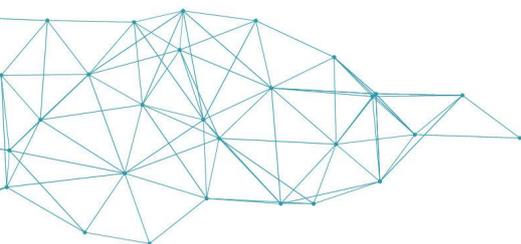
⁹⁵ World Economic Forum (n 64), p.9.

⁹⁶ Meta, 'A New Era for Mixed Reality' *Meta Quest Blog* (Meta, 2024) <<https://www.meta.com/en-gb/blog/quest/meta-horizon-os-open-hardware-ecosystem-asus-republic-gamers-lenovo-xbox/>> accessed 12 November 2024.

⁹⁷ European Commission (n 43), p. 4.

⁹⁸ World Economic Forum (n 64), pp.14-16.

⁹⁹ An ultimate example of persistence is the Live Forever mode, an automatic recording mode on consumers' "own property" for future AI analysis to bring your avatar to life once you die [Aishwarya Banik, 'The Tale of Metaverse Immortality! How Do People Live After Dying?' (*Analytics Insight*, 12 June 2022) <<https://www.analyticsinsight.net/augmented-virtual-reality/the-tale-of-metaverse-immortality-how-do-people-live-after-dying>> accessed 12 November 2024].



Synchronicity implies that virtual worlds must be rendered in real time to all users regardless of where they connect from. While game engines have improved a lot, this is still one of the biggest challenges for building the Metaverse¹⁰⁰. Every participant in a virtual world would need an internet connection capable of transmitting large volumes of data in a given time (high bandwidth) as well as low latency (fast) and continuous (sustained and uninterrupted) connection to a virtual world's server (both to and from). Additionally, synchronicity and persistence are hindered by limitations in computing power: the higher the number of concurrent users and the more information that persist in a virtual world, the greater the computational needs and the less memory and power that is available for other activities¹⁰¹. The amount of data that must be read, written, processed, synchronized and rendered available to create and sustain experiences in the Metaverse is not just unprecedented, but it is far beyond anything possible today. Technology will need to evolve a lot of we want to replicate in the Metaverse the density and the flexibility of the real world¹⁰².

Synchronicity and persistence imply that virtual worlds should be unique, and that they should be accessible regardless of the jurisdiction where the user is located. This created a challenge for law enforcement. While access to web sites and internet applications from a particular State may be blocked without compromising access to that resource by users located in other countries, blocking of a content in a virtual world from one jurisdiction may affect the interactive experience of all the users. Synchronicity, persistence and unlimited users' access to a virtual world cannot be fully guaranteed without an adequate solution to this challenge.

2.2. Main players of the metaverse: infrastructure providers, platforms, developers and users

This section aims to explain the metaverse focusing on the main players that are contributing to its development. They are classified as infrastructure providers, virtual world platforms, developers and users.

2.2.1. Infrastructure providers

This first group of actors includes companies that provide hardware, software and networks which provide and support operability, computing and scalability in the metaverse. Network operators (e. g. Telefonica, Deutsche Telekom or Vodafone), cloud storage providers (e. g. AWS, Google Cloud), developers of AR/VR devices (e. g. Apple Vision Pro, Meta Quest or Microsoft HoloLens), manufacturers of GPUs and CPUs (e. g. Nvidia, AMD or Intel) and blockchain service providers are included in this first category. According to the World Economic Forum, advancement in these technologies is a prerequisite for impactful Metaverse mass adoption¹⁰³.

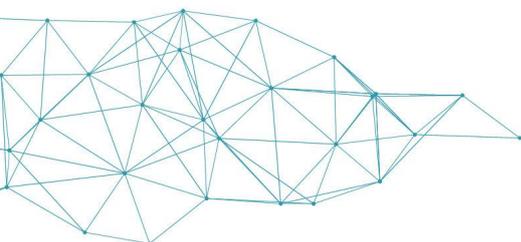
Infrastructure also refers to the software that is needed to improve the efficiency of the above-mentioned hardware and for rendering virtual worlds and virtual experiences. In this latter case, companies such as Epic (Unreal) or Unity Technology, previously active

¹⁰⁰ Ball (n 62) p. 48.

¹⁰¹ *ibid*, p. 45.

¹⁰² *ibid*, p. 54.

¹⁰³ World Economic Forum (n 7), p. 26.



in a niche market such as that of videogames, are now called to play a central role for the development of the Metaverse thanks to their game engines¹⁰⁴ and their gained experience in creating “digital worlds”. Other companies such as Meta or Roblox have their own game engines. This software enables developers (i. e. individuals, creators and organizations) to create digital twins, to design immersive experiences, and to build, own and transact land, property and other digital assets in virtual worlds. Additionally, advancements in AI will help to make metaverse-related applications more intelligent and conversational, will enable large data processing powers, and will put design tools in the hands of users and developers (e. g. programmatic content generation tools, image restoration and enhancement)¹⁰⁵.

2.2.2. Platforms: centralization vs. decentralization

There are several kinds of companies covered by this category. The most important ones are the Interactive Virtual World Platforms (IVWP)¹⁰⁶. They sit at the center of metaverse experiences, they define the environment in which virtual worlds exist for users to interact, the tools available for creators, a marketplace where digital assets can be transacted, and the degree of interoperability with other environments.

These platforms can be centralized or decentralized. The first are platforms owned and governed by a company (e. g. Meta Horizon Worlds or Roblox), who has control on data concerning its users including their identity, the (personal) data generated by the use of its services, digital assets purchased, the system used for payment (e.g. Robux for Roblox). The platform also has control over other companies or developers that want to offer, apps, contents or services (e. g. advertising) to its users in their marketplaces. Since the access to digital assets is managed by a central server (operator), if that server (operator) were to go out of business users would immediately lose access to all their digital assets, experiences, and worlds¹⁰⁷.

The second category of IVWP is based on blockchain technologies (e. g. Decentraland or The Sandbox) thus information is decentralized among all the nodes of the network with no central operator. Users of these platforms have control of their identities, the personal data they want to share (Self-sovereign Identity), and on the digital assets they purchase (represented in NFTs). Since such decentralized database can be accessed by anyone, users can use and display the information stored in the blockchain in different virtual worlds (e.g. digital assets purchased in OpenSea can be displayed in Decentraland or The Sandbox). Payments are made with cryptocurrencies (e.g. Mana in Decentraland) which are also recorded in the blockchain. Finally, decisions about governance of the platform may be adopted by the community, generally through a Decentralized Autonomous Organisations (DAO)¹⁰⁸ – this is the case, for instance, of Decentraland –. While there are prominent examples, this category of IVWP is in a nascent stage due to the uncertainties and the challenges that exist for the full deployment of blockchain technologies.

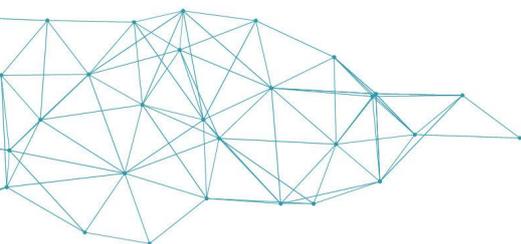
¹⁰⁴ Other companies with relevance in this sector are VRDirect or VATOM.

¹⁰⁵ World Economic Forum (n 7), p. 26; J Peter, ‘Roblox’s New AI Chatbot Will Help You Build Virtual Worlds’ (*The Verge*, 8 September 2023) <<https://www.theverge.com/2023/9/8/23863943/roblox-ai-chatbot-assistant-ai-rtc-2023>> accessed 12 November 2024.

¹⁰⁶ Ball (n 62), p. 54.

¹⁰⁷ De Filippi (n 72).

¹⁰⁸ A comparative table can be found in: Moy and Gadgil (n 14), p. 4.



Alongside IVWP, there are other platforms that provide ancillary services either outside of or through integration with virtual environments. The most important ones are payment platforms, which are needed for users and creators to buy and sell goods in virtual worlds. Metaverse-related transactions may be conducted in fiat currency (e. g. Mastercard, Pay Pal), in-platform currencies (e. g. Robux) or in cryptocurrencies (e. g. Mana or Bitcoin). The interplay of various payment means and currencies is expected to create a need for services such as currency conversion, wallets for digital assets and custody services to protect assets from potential threats¹⁰⁹.

Other platforms of ancillary services are NFT marketplaces, such as OpenSea, where digital work can be purchased for instance to decorate my home in a virtual world; or Decentralised Digital Identity management systems, such as Read Player Me¹¹⁰, that enable users to visit worlds in different IVWPs (in the case of the former, VRChat, Somnium Space or Spatial) under a single identity and a unique avatar.

2.2.3. Content and virtual world developers (CVWD)

Thanks to the tools provided by IVWP, individuals and businesses can create their own virtual worlds or content or experiences for these worlds. Certain companies are creating their own virtual worlds or virtual spaces in platforms such as Roblox (e. g. Nikeland) or Decentraland (Dolce & Gabbana) to advertise their products and improve the interaction with their clients. In the case of retailers, they may even provide experiences that merge virtual and physical reality, augmenting a shopping trip or enabling try-ons.

The media, entertainment and sports (MES) industry will play a pivotal role by offering content and experiences for virtual worlds: personalized 3D experiences (based on users' unique identities) in media and film, or new forms of experiencing sports events, concerts (e. g. Travis Scott in Fortnite) and theme parks. They will be accompanied by new means of advertising and marketing techniques offered by specialized providers. These techniques will shift towards more experience-driven, non-static ones¹¹¹.

Players in the gaming industry, such as Epic Games and Roblox, are pioneering ideas of what the metaverse could be, both in terms of engaging content, attracting audiences, and defining business models. These platforms are not only used for playing games. They are becoming the most sought-after virtual destinations for socializing, alongside other platforms which specialize in this later aspect (e. g. VR Chat). They provide opportunities for brands and businesses to directly purchase in-game advertising and launch advertisement experiences¹¹².

But revenues of IVWP will not only come from advertising or, in certain cases, subscription fees or premium offerings. Each platform has its own marketplace where digital products, such as in-game assets (skins, wearables) or artworks are sold¹¹³. These marketplaces are also open to contents created by users thanks to the tools provided by the platform. This turns users into creators who collaborate among them or sell directly to other users, or brands, expanding the *creator economy* to the metaverse¹¹⁴. In cases where

¹⁰⁹ World Economic Forum (n 7), p. 26.

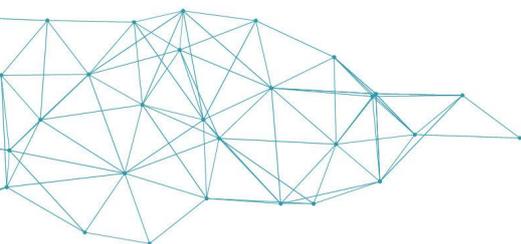
¹¹⁰ Visit: <https://readyplayer.me/>.

¹¹¹ World Economic Forum (n 7), p. 18.

¹¹² *ibid.*, p. 14.

¹¹³ These marketplaces may also include "phygital" products that provide utility within and across virtual experiences that extend to the physical simultaneously [*ibid.*, p. 31].

¹¹⁴ *ibid.*, p. 19.



the marketplace is not in the hands of a centralized entity but is based on blockchain (e. g. OpenSea), opportunities for creators to monetize their talent increase thanks to the flexibility that NFTs provide to exchange, trade, transfer and held digital assets in an unlimited number of virtual worlds supporting the technology. Many specialists see the Web3 as an opportunity to reinvent the way value is generated and shared among a diverse set of creators, brands and businesses¹¹⁵.

2.2.4. Users and avatars

Users consume, exchange and transact with content, services and experiences generated by content creators.

As previously mentioned, users can be *creators* as well. User-generated content (UGC) has been a vital building block of the gaming industry for years. It provides virtual environments with personality and authenticity. An expanding creator economy, in which tools for creation are widely available and easy to use, is essential to ensuring a steady flow of creativity into virtual worlds with new, engaging and personalized content that will inspire and retain users and ensure diverse and inclusive experiences. The metaverse brings this model a step further by enabling creator economies in which creators can monetize their IP in perpetuity, through royalties.

Users act in the metaverse through *avatars*. They are the digital representation of humans, although it is debated whether avatars should be considered and protected as personal identities, original creations, or digital content. They can be realistic or fantastic avatars, and they can be customized with available digital assets (skins) provided by virtual marketplaces¹¹⁶. Users can establish one or more unique identities and avatars in the metaverse thanks to digital identity services. Digital identity enables ownership throughout metaverse platforms and access to specific events and experiences. Users can get more tailored experiences based on their identity's information. For metaverse mass adoption, several authors consider essential that users can act under a single identity in different virtual worlds. While certain proprietary technologies may provide solutions for this, decentralized digital identifiers seems to be the only solution that may ensure interoperability¹¹⁷.

3. Legal implications of the metaverse – an overview

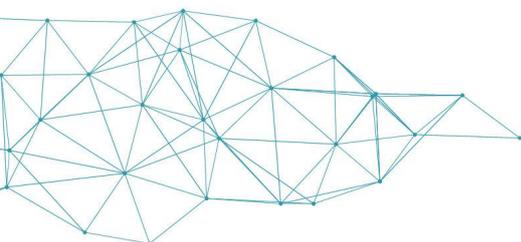
As anticipated in the introduction, from an EU perspective, the most important question concerning the regulation of the metaverse is whether the new European Digital Acts apply to Interactive Virtual World Platforms (IVWP) and the various actors involved in metaverse-related activities and experiences. Considering the broad scope of application of these Digital Acts, the initial response is in affirmative. However, there are more specific legal questions that would require in the future a proper attention¹¹⁸. Here follows a non-

¹¹⁵ *ibid.*, p. 19.

¹¹⁶ *ibid.*, p. 26.

¹¹⁷ Giovanni Sorrentino, 'A Unique Digital Identity in the Metaverse: State of the Art and Future Challenges' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*.

¹¹⁸ Other works introducing metaverse regulatory challenges include: Antonio Serrano Acitores, *Metaverso y Derecho* (Tecnos 2022, Madrid); Fabiana Di Porto and Daniel Foà, 'Defining Virtual Worlds: Main Features and Regulatory Challenges - Issue Paper (CERRE, 2023) <<https://cerre.eu/publications/defining-virtual-worlds->



exhaustive list of issues for a private law perspective. Questions on taxation, cybersecurity, criminal law or administrative law are equally relevant, but they are outside our scope of expertise.

3.1. Openness and interoperability

The most repeated concepts in the European Commission working documents concerning virtual worlds and metaverse are “openness” and “interoperability”. As previously mentioned, the metaverse is emerging at a time where Internet is dominated by a few tech giants (Google, Meta, Apple, etc...) who have spent the past decade closing their ecosystems. The Commission’s Initiative reminds that those companies are trying to expand their dominant positions in Web 2.0 to the metaverse¹¹⁹. Additionally, platforms of virtual worlds have evolved using their own game engines and saving their contents and information into entirely different file formats and without a system through which to even try to share data to other virtual worlds. Today’s virtual worlds and their builders never designed their systems or experiences to be interoperable. Instead, they were intended to be closed experiences with controlled economies – and be optimized accordingly¹²⁰.

There is thus a risk of having a small number of big players becoming future gatekeepers of virtual worlds. Such a closed ecosystem with the prevalence of proprietary systems would negatively affect openness of virtual worlds, raising market entry barriers and foreclosing EU start-ups and SMEs from these emerging markets¹²¹. As explained in Section IV, the DMA includes provisions aimed to prevent and reduce the negative effects of this scenario. But there are other instruments that may also play an important role and whose adaptation to the metaverse needs to be assessed. These include the general EU Competition Law rules¹²², or the recent Proposal for a Regulation on standard essential patents that may indirectly affect the setting of metaverse-related standards¹²³.

[main-features-and-regulatory-challenges/](#)>; Pier Luigi Parcu and others, 'How Real Will the Metaverse Be? Exploring the Spatial Impact of Virtual Worlds' (2023) 31:7 European Planning Studies 1466-1488; Matthias C. Kettemann, Martin Müller and Caroline Böck, 'Regulatory Approaches to Immersive Worlds: An Introduction to Metaverse Regulation' (2023) <<https://www.metaverse-forschung.de/en/2023/09/25/963/>>; Moisés Barrio, 'El Metaverso y su Impacto en el Estado y la Soberanía' (2023) Revista de Derecho Político (117) 197-220; Fulvio Sarzana di S. Ippolito, Marco G. Pierro and Ivan O. Epicoco, *Il Diritto del Metaverso -NFT, Defi, GameFi e Privacy* (Giappichelli, Namur 2022).

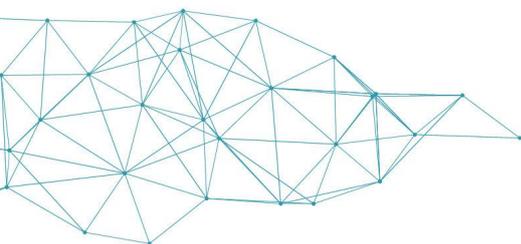
¹¹⁹ Take Apple and Google as an example. They have a dominant position in app stores of mobile devices thanks to Google Play (in the case of Android devices) or the AppStore (in the case of iOS devices). This means that, in practice, apps cannot be directly downloaded from the Internet, but through the app stores. As a consequence, access to metaverse-related apps with mobile devices is thus, dependent on them. This gives the two big techs a privilege position to control access to the Metaverse and to impose their standards.

¹²⁰ Ball (n 62), p. 121.

¹²¹ European Commission (n 43), p. 13.

¹²² Andrea Piletta Massaro, 'Metaverse and Competition Law' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 159-177; Luca Megale, '(Meta)verse as the Next Escaper from Competition Public Enforcement' (2022) 6(2) Market and Competition Law Review 15-50; Vanessa Jiménez Serranía, 'El Metaverso y el Derecho de la Competencia: Nuevas Estructuras Digitales, Nuevos Modelos de Negocio, ¿Nuevas Reglas?' in Antonio Robles Martín-Laborda and Aitor Zurimendi Isla (dirs), *Estudios de la Red Académica de Defensa de la Competencia (RADC)* (2022) 89-119; Klaus Kowalski, Cristina Volpin and Zsolt Zombori, 'Competition in Generative AI and Virtual Worlds - Competition Policy Brief, Issue 3' (European Commission, 2024) <https://competition-policy.ec.europa.eu/document/download/c86d461f-062e-4dde-a662-15228d6ca385_en>.

¹²³ European Commission, 'Proposal for a Regulation on standard essential patents and amending Regulation (EU) 2017/001' (2023) COM(2023)232 FINAL.



As stated by the European Commission, “standardisation will be key to enable interoperability between different platforms and networks, enabling the seamless use of identities, avatars, data, virtual assets, experiences or environments and the associated rights across platforms and networks”. In its opinion, “open standards are key to ensuring that the future Web 4.0 ecosystem will not be dominated by a select few, setting de facto standards and creating market entry barriers”. For this reason, the Commission, in cooperation with Member States and stakeholders, plan to engage with key organisations active in the development of standards for open and interoperable virtual worlds and Web 4.0. These efforts will feed into the EU Strategy on Standardisation¹²⁴.

3.2. Legal status of avatars and digital identity

As previously mentioned, an avatar is the digital representation of a user in virtual worlds. The design and use of avatars will raise an amount of legal and ethical questions¹²⁵. Does our avatar need to reflect our real look (and relevant attributes) in the metaverse, or can we use any avatar we wish to create, customize or select? Should we interact with a single avatar, or would it be possible to have different avatars depending on the virtual world? Are there any limits in choosing our avatars? Will our avatars enjoy a right of image? Do we own our avatars? Based on the information the platform has about our behavior, our avatars may still interact with others while we disconnect from a virtual world. Who would be responsible for their acts in those cases?¹²⁶ Additionally, platforms may create AI-powered avatars to interact with us according to our preferences. Should users be informed of the synthetic nature of the avatars they interact with?¹²⁷ Should there be any limits on the actions non-human avatars can engage in?¹²⁸

The use of avatars is also related with digital identity. Would it be possible to have a single identity in the different virtual worlds or metaverses? Having in mind the introduction of the European Identity Digital Wallet in the recently adopted eIDAS 2.0 Regulation¹²⁹, such possibility is closer than ever for Europeans¹³⁰. But does it mean that a person always need to be clearly identified when acting in virtual worlds? Is digital identity

¹²⁴ European Commission, ‘An EU Strategy on Standardisation Setting global standards in support of a resilient, green and digital EU single market’ (2022) COM(2022) 31 final <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022DC0031>>.

¹²⁵ Martin Ebers, ‘Avatars and the Protection of Digital Identities in the Metaverse’ (2024) *MetaverseUA Chair Research Paper #3* <<https://metaversechair.ua.es/working-papers/>>; Vera Lucia Raposo, ‘Beyond Pixels and Profiles: Unveiling the Legal Identity of Avatars in the Metaverse’ (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Letizia Coppo, ‘Fundamental Rights and the Metaverse: Avatar-Player Relationships’ in Larry DiMatteo and Michel Cannarsa (eds) *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 79-98.

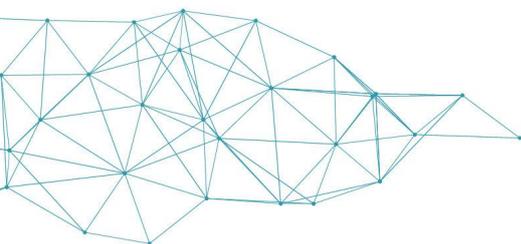
¹²⁶ The European Parliament recalls that “avatars do not have legal personality so any issues regarding their legal capacity, rights, obligations and liabilities needs to be addressed with reference to the natural or legal persons using them; considers that, as virtual worlds evolve and become more complex, consideration should be given to the appropriateness of granting a specific legal status to avatars” [European Parliament (n 37), p. 21].

¹²⁷ See, in this regard, art. 50 AI Act.

¹²⁸ Adrien Basdevant, Camille François and Rémi Ronfard, ‘Mission Exploratoire sur les métavers’ (Gouvernement de la France, 2022) <<https://www.economie.gouv.fr/files/files/2022/Rapport-interministeriel-metavers.pdf>>, p. 92.

¹²⁹ Regulation (EU) 2024/1183 of the European Parliament and of the Council of 11 April 2024 amending Regulation (EU) No 910/2014 as regards establishing the European Digital Identity Framework [2024] OJ L (from now on, “eIDAS 2”).

¹³⁰ Steffen Schwalm and Andre Kudra, ‘Decentralised Digital Identity in the Metaverse under eIDAS 2.0’ (2024) *MetaverseUA Chair Research Paper #4* <<https://metaversechair.ua.es/working-papers/>>.



compatible with the use of pseudonyms or anonyms in our activities in virtual worlds?¹³¹ The European Parliament stresses that, “*wherever the user’s identification is not required by Union or national law, namely for liability purposes, and it is technically possible and reasonable, virtual worlds should enable the anonymous use of services as a way of providing a protective shield for privacy and effectively prevent unauthorised data disclosure, identity theft and other forms of abuse of personal data collected online*”¹³². However, at the same time the Parliament is concerned that “*the use of avatars and decentralised systems, such as those built on blockchain technology, might make it extremely challenging to hold tortfeasors accountable, and that the implementation of effective identity management systems is key in order to allow for their proper and timely identification and to combat fake identities*”. In this regard, it is sustained that “*the person behind the avatar should be identifiable and a know-your-business-customer principle should be applicable*”¹³³.

3.3. Personal data protection

The development of the metaverse will entail a significant increase in the volume of data generated, processed and transferred, most of which will be of a personal nature. This data will also be of a very diverse nature, including data collected through XR devices, haptic devices or BCI (Brain-Computer Interfaces) related to our feelings or even inferring emotions, or to our physical behavior in the metaverse¹³⁴. These data types may include (perceived) field of view (FoV), voice analysis, biometric data such as heart-rate monitoring, iris scans, pupil dilation, and inferred data like gait detection¹³⁵. Much of this data might be considered “sensitive”, so data controllers will have to find ways to comply with the requirements and guarantees demanded by art. 9 GDPR in a manner adapted to these new virtual environments.

Additionally, a discussion is opened on the need to regulate so-called “neuro-rights”¹³⁶, a person’s freedom to decide whether he/she authorizes or not the surveillance, monitoring or modification of his/her brain’s activity¹³⁷.

¹³¹ Basdevant, François and Ronfard (n 128)., p. 94.

¹³² European Parliament (n 55), point 11.

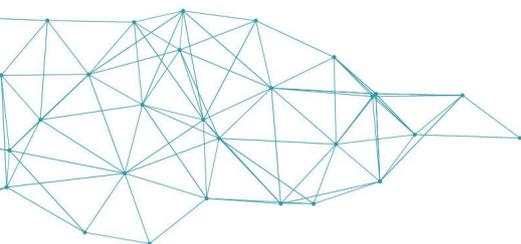
¹³³ *ibid.*, points 20-21.

¹³⁴ According to the European Parliament, “*recent research has shown that VR sensor data is as uniquely identifiable as a fingerprint scan and can be used to gain deep insights into users’ personality and infer a variety of attributes such as age, gender, income, ethnicity, disability status, state of mind and emotions; believes that this raises significant ethical and legal concerns, in particular in connection with targeted behavioural advertising, that should be addressed; stresses that part of addressing these ethical concerns around the collection of vast amounts of personal data, including sensitive user data such as biometric and behavioural data, emotional reactions and haptic information, is to guarantee that users are aware of the data being collected and that consent for the collection of such data is not obtained only at the time of entry to the virtual world, but for each use case in line with the principles laid out by the GDPR, such as those of privacy by design and purpose limitation*” [*ibid.* point 10].

¹³⁵ World Economic Forum (n 64), p. 16.

¹³⁶ The most relevant association working in this topic is the Neurorights Foundation, created by Columbia University in 2019 [Neurorights Foundation, ‘About us’ (Neurorights Foundation, 2024) <<https://neurorightsfoundation.org>> accessed 12 November 2024].

¹³⁷ Chile has been the first country in regulating neurorights at Constitutional level [Lorena Guzmán, ‘Chile: Pioneering the Protection of Neurorights’ (UNESCO Courier, 2022) <<https://en.unesco.org/courier/2022-1/chile-pioneering-protection-neurorights>>]. In Spain, the non-binding Charter of Digital Rights also includes a set of neuro-rights in art. 26. The text is available at: https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/140721-Carta_Derechos_Digitales_RedEs.pdf



There might also be difficulties for users to exercise some of their legal prerogatives such as the right of erasure or to be forgotten (is it compatible with the attribute of persistence?) or the right of portability (is it feasible without interoperability among virtual worlds?).

All these dilemmas are accentuated by the inherent features of the metaverse (transnational or delocalised character, continuity and interoperability between different environments, etc.), the multiplicity of actors that will participate in it and the difficulties with the attribution of responsibilities that it entails, in particular in the case of virtual worlds based on decentralized infrastructure and governance schemes. As mentioned in the Commission Initiative, the EU already has a strong regulatory framework on personal data protection and privacy¹³⁸, but the adaptation of such framework to the particularities of virtual worlds and metaverse-related technologies is still to be addressed¹³⁹.

3.4. Content/behavior moderation

As the metaverse becomes increasingly popular, there is an urgent need to create and maintain a safe, fair, transparent, and inclusive environment for all users so as to guarantee a positive virtual experience¹⁴⁰. This requires the implementation of adequate measures that prevent, in real time, not just illegal contents, but also unlawful behaviors such as cyberbullying, harassment or hate speech (especially for the most vulnerable subjects like children), while at the same time striking a proper balance with fundamental rights such as freedom of expression¹⁴¹.

Tools adopted to confront this multidimensional challenge (e.g., community guidelines, AI-based applications, decentralized moderation schemes) and to empower users ("safe zone" tools, notice and action mechanism) will also need to comply with the growing number of instruments on content regulation adopted and foreseen by the EU institutions – e.g. the Digital Service Act, Regulation 2021/784 on the dissemination of terrorist contents¹⁴², Art. 17 Directive 2019/790 on copyright in the Digital Single Market¹⁴³,

¹³⁸ European Commission (n 43), point 5.

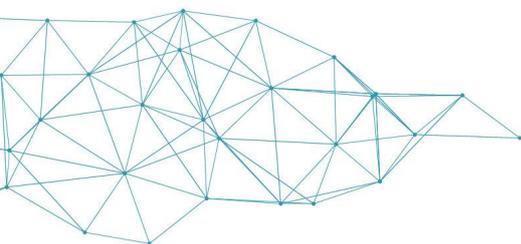
¹³⁹ Pablo Trigo Kramcsák and Vagelis Papakonstantinou, 'Personal Data Processing within Immersive Virtual Worlds: Privacy Challenges in the Interconnected Data-Driven Metaverse' (2024) *MetaverseUA Chair Research Paper #2* <<https://metaversechair.ua.es/working-papers/>>; Francisco Javier López-Guzmán, 'Ubiquity of Personal Data through the Virtual Worlds' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Natalia Menéndez, 'Blockchain for Avatar Data Governance: Privacy-enhancing Metaverse?' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Óscar Casado and others, 'Retos de la Privacidad en el Metaverso' in Luis Ignacio Vicente del Olmo and José Luis Amat (coords), *Aspectos Jurídicos del Metaverso* (La Ley 2022) 111-158; Lokke Moerel, 'Metaverse and Data Protection' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 118-158.

¹⁴⁰ European Commission (n 43), points 8-9.

¹⁴¹ An example of this challenge comes from the dispute between the Anti-Defamation League and Roblox in relation to virtual worlds in the platform recreating the horrific mass shooting that took place in a mosque in Christchurch, New Zealand, in 2019. Roblox proactively monitor for terrorist contents, however references to the Christchurch shooting are particularly difficult to block through automatic text searches since a catchall filter would also block references to the city [Russell Brandom, 'Roblox is Struggling to Moderate Re-creations of Mass Shootings' (*The Verge*, 17 August 2021) <<https://www.theverge.com/2021/8/17/22628624/roblox-moderation-trust-and-safety-terrorist-content-christchurch>> accessed 12 November 2024].

¹⁴² Regulation (EU) 2021/784 of the European Parliament and of the Council of 29 April 2021 on Addressing the Dissemination of Terrorist Content Online [2021] OJ L 172/79.

¹⁴³ The European Parliament "acknowledges the applicability of liability rules as laid down in the Digital Services Act and of the special regime established in Article 17 of the Copyright Directive to cover the uploading of user-



Commission Recommendation on tackling illegal content online¹⁴⁴, Directive 2011/93 on sexual abuse and child pornography¹⁴⁵ or the Proposal for a Regulation on child sexual abuse¹⁴⁶. Due to its relevance, Section 4.2 will further develop on the application of the DSA to content moderation in the metaverse¹⁴⁷.

3.5. Intellectual property

Many elements of the metaverse are protectable under different categories of IP rights¹⁴⁸. Technology supporting the infrastructure¹⁴⁹ or the points of access (VR/AR devices) can be protected by patents¹⁵⁰, trade secrets or copyright – in the case of software. Virtual worlds or contents of those digital environments are protectable under copyright or industrial design¹⁵¹. While legislation on intellectual property fully apply to virtual worlds¹⁵², this does not mean that such application does not create frictions¹⁵³. In the case of industrial designs, questions have been raised on whether the design representation requirements might be outdated, in particular in relation to 3D computing-animated designs generating

generated content; believes, however, that further clarification is needed on how existing rules should apply to online content-sharing services that make content available in virtual worlds and how they should be enforced [European Parliament (n 55), point 25].

¹⁴⁴ European Commission, 'Recommendation (EU) 2018/334 of 1 March 2018 on Measures to Effectively Tackle Illegal Content Online' (2018) L 63/50 <<http://data.europa.eu/eli/reco/2018/334/oj>>.

¹⁴⁵ Directive 2011/93/EU of the European Parliament and of the Council of 13 December 2011 on Combating the Sexual Abuse and Sexual Exploitation of Children and Child Pornography [2011] OJ L 335/1.

¹⁴⁶ European Commission, 'Proposal for a Regulation Laying Down Rules to Prevent and Combat Child Sexual Abuse' (2022) COM(2022) 209 final <<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52022PC0209>>.

¹⁴⁷ Noemie Krack and Jean De Meyere, 'Virtual Worlds: Real Risks: Exploring User Safety in the Metaverse under the Digital Services Act' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Gian Marco Bovenzi, 'Content Moderation in (Decentralized) Metaverses' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Adèle Serio, 'Protecting Young Players in the Metaverse' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Cristina Mesa Sánchez, 'Moderación de Contenidos en el Metaverso', 'Retos de la Privacidad en el Metaverso' in Luis Ignacio Vicente del Olmo and José Luis Amat (coords), *Aspectos Jurídicos del Metaverso* (La Ley, 2022) 69-110; Julián López Richart, 'La Moderación de Contenidos en el Metaverso y sus Implicaciones para la Propiedad Intelectual' in Aurelio López-Tarruella Martínez (dir), *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (REUS 2023).

¹⁴⁸ Susana Navas Navarro (dir), *Metaverso, Arte Tokenizado y Propiedad Intelectual* (REUS 2023); Aurelio López-Tarruella Martínez (dir), *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (REUS 2023).

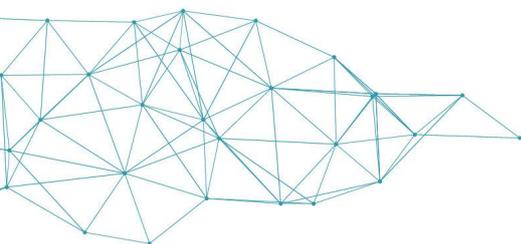
¹⁴⁹ Nike was granted a patent in the US for the generation of a token using blockchain related to the sale of digital footwear [Google Team, 'US Patent US10505726B1 - System and Method for Providing Cryptographically Secured Digital Assets' (Google Patents, 2024) <<https://patents.google.com/patent/US10505726B1/en>> accessed 12 November 2024].

¹⁵⁰ Iony Randrianirina, 'Patent Law and the Metaverse' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 207-217. In April 2023, a search in Espacenet under the term "metaverse" provided more than a thousand entries.

¹⁵¹ Andy Ramos Gil de La Haza, 'Protección de las Creaciones Intelectuales en el Metaverso' in Aurelio López-Tarruella Martínez (dir), *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (REUS 2023); Péter Mezei and Gunjan Chawla, 'Copyright and Metaverse' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 190-207.

¹⁵² European Commission (n 43), p. 5.

¹⁵³ Gaetano Dimita and others, 'IP and Metaverse(s) - An Externally Commissioned Research Report' (UKIPO, 2023) <<https://www.gov.uk/government/publications/ip-and-metaverses-an-externally-commissioned-research-report/ip-and-metaverses-an-externally-commissioned-research-report>>.



motion simulations¹⁵⁴. Questions have been raised as well on how to ensure the protection of trademarks in the metaverse¹⁵⁵ and about the existence of infringement in cases where the trademark is used in digital assets represented in NFTs¹⁵⁶. The European Parliament has stressed the challenges that virtual worlds pose when it comes to intellectual property enforcement, identification of infringers and issues concerning the conflict-of-law rules on applicable law and jurisdiction¹⁵⁷.

Contents of virtual worlds will be increasingly built by individual creators thanks to design tools provided by platforms. Many times, these contents will be created in a collaborative way, thus generating a problem of joint ownership. Additionally, these tools may be AI-powered thus generating a problem on determination of authorship. To address these challenges the development of new ways of managing content, IP rights and ownership will be required for marketplaces in virtual worlds to flourish. In the case of centralized platforms, governance schemes (Terms of use) of these markets should ensure a fair value distribution. But Web3 technologies offer new opportunities to these creators to maximize their benefits by offering their digital assets in NFTs markets¹⁵⁸. For the World Economic Forum, “advancements in governance and regulation (including IP right management) to enable fair value distribution and a sustainable creator economy is a prerequisite for an impactful metaverse mass adoption”¹⁵⁹.

3.6. Virtual worlds' markets

According to the European Parliament, the number and economic relevance of commercial transactions within virtual worlds is expected to increase over the next decade¹⁶⁰. Similar to analog or digital markets, two categories of transactions can take place in virtual world markets: business-to-business or business-to-consumer, without disregarding the potential of sharing economy in the metaverse based on peer-to-peer transactions.

In relation to the first category, it has already been said that mechanics for transparent and fair value distribution in the metaverse will be essential to ensure a

¹⁵⁴ Rebeca Ferrero Guillén and Anastasiia Kyrylenko, 'Marcas y Diseños en el Metaverso: Cómo Adentrarse en la "Nueva" Realidad Virtual' in Aurelio López-Tarruella Martínez (dir), *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (REUS 2023) 167-192; Enrico Bonadio and Rishabh Anjay Mohnot, 'Trademarks and Image Rights in the Metaverse' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 177-190.

¹⁵⁵ EUIPO issued some guidance notes clarifying that virtual goods are proper to Class 9 because they are treated as digital content or images. However, the term virtual goods on its own lacks clarity and precision so must be further specified by stating the content to which the virtual goods relate. Additionally, the 12th Edition of the Nice Classification will incorporate the term downloadable digital files authenticated by non-fungible tokens in Class 9. Services relating to virtual goods and NFTs will be classified in line with the established principles of classification for services [EUIPO, 'Virtual Goods, Non-Fungible Tokens and the Metaverse' (EUIPO, 2022) https://euipo.europa.eu/ohimportal/en/news-newsflash/-/asset_publisher/JLOyNNwVxGDF/content/pt-virtual-goods-non-fungible-tokens-and-the-metaverse accessed 12 November 2024].

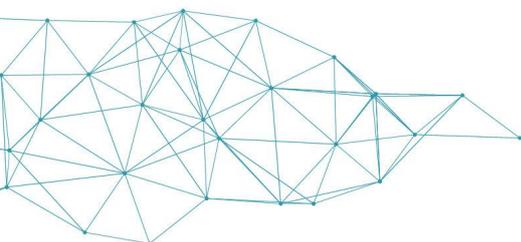
¹⁵⁶ Vanessa Jiménez Serranía, 'Web 3.0, NFTs y Propiedad Intelectual' in Aurelio López-Tarruella Martínez (dir), *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (REUS 2023), 73-117.

¹⁵⁷ According to the European Parliament, “the development of virtual worlds poses new challenges when it comes to intellectual property enforcement, identification of infringers and issues concerning the conflict-of-law rules on applicable law and jurisdiction” [European Parliament (n 55), point 22].

¹⁵⁸ Tristan Girard-Gaymard, 'Role of NFTs, Cryptocurrencies and Blockchain Technologies' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 49-60.

¹⁵⁹ World Economic Forum (n 7), p. 14.

¹⁶⁰ European Parliament (n 55), point 17.



sustainable economy. The EU already has legislation that aims to achieve these objectives (i.e. P2B Regulation¹⁶¹) specifically in the vertical relationship between business users (and IVWP and other business users) and CVWD and IVWP, although its adequacy for these markets would need to be determined. To start with it is doubtful that creators should be considered “business users” for the purpose of the P2B Regulation¹⁶². Additionally, it is equally doubtful whether such regulation framework is fit for decentralized platforms governed by DAOs where participants are difficult to identify or act anonymously.

In relation to the second, consumers’ virtual lives will entirely or at least partly shift into the metaverse, creating new digital channels for companies to make use of for marketing purposes¹⁶³. This shift will trigger a transformation of traditional marketing and advertising models. Metaverse advertising models will use immersion, storytelling and user expression through authentic content and experiences. Brands are already creating virtual worlds to connect with end-users or free games and events to engage with them, creating a deeper connection with the brand by learning about the company, its products and driving sales. They are also experimenting with targeted, programmatic and AI-driven models to place products in digital marketplaces and to serve ads on virtual banners, billboards and during gameplay. 3D advertising experiences and XR ads that bridge the virtual and physical worlds are also being developed¹⁶⁴.

As stated by the World Economic Forum, data protection and privacy needs must be front and center in metaverse-related marketing and advertisement. But not only that. All these new marketing techniques would need to comply with EU regulation on unfair commercial practices (e. g. Directive 2005/29, arts. 25 – 28 DSA). As an example, the European Parliament has raised concerns about the advertising techniques used when selling so-called virtual real estate, such as a building or a piece of land in a virtual world represented by an NFT, as users might be led to believe that they are actually acquiring property rights, when, in practice, they only obtain a license to use the virtual “land”¹⁶⁵.

As further explained below, there are two types of transactions to be considered in any metaverse experience. On the one hand, the relationships entered into by the IVWP and the users (both professional user and consumers)¹⁶⁶. This relationship (membership agreement) is studied below under 4.1. On the other hand, the wide array of relationships that can take place “within a virtual world”¹⁶⁷. This is the kind of relationships we are referring in this subsection to note its relevance but discarding in this Paper a deeper analysis.

¹⁶¹ Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services [2019] OJ L 186/57 (from now on, “P2B Regulation”).

¹⁶² According to art. 2(1) P2B Regulation: “‘business user’ means any private individual acting in a commercial or professional capacity who, or any legal person which, through online intermediation services offers goods or services to consumers for purposes relating to its trade, business, craft or profession”.

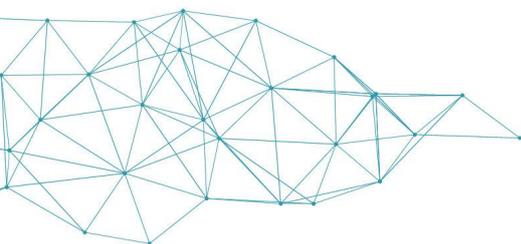
¹⁶³ Mariano Alcañiz, Enrique Bigné and Jaime Guixeres, ‘Virtual Reality in Marketing: A Framework, Review, and Research Agenda’ (2019) 10 *Frontiers in Psychology*.

¹⁶⁴ World Economic Forum (n 7), p. 28, 40 and 41.

¹⁶⁵ European Parliament (n 55), point 18.

¹⁶⁶ Francisco de Elizalde, ‘Consumer Protection in the Metaverse’ in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 98-118.

¹⁶⁷ Eric Tjong Tjin and Daniëlle Op Heij, ‘Metaverse as a Network of Contracts’ in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 26-49.



3.7. Dispute resolution and applicable law

Judicial courts are unsuited for hearing and settling disputes between virtual worlds' platforms and its users (either as consumers or as business users), and in certain disputes between the platforms or its users with third parties (e. g. IP right infringements, vulnerability of personality rights). Judicial proceedings are slow, complex and expensive in relation to the value of the dispute. Such inadequacy increases when disputes are of an international, cross-border, or even more no-border, character. This would be the case due to the aterritorial nature of virtual worlds¹⁶⁸. In such cases, judicial courts need to determine their jurisdiction and identify the applicable law. Neither of both are an easy task. Regulation of international disputes in the digital environment (including virtual worlds) is based on a paradox: the application of criteria based in the connection of the dispute to the territory of a State to determine the jurisdiction and applicable law to disputes that take place in a non-State "space", the digital space, where territories do not make sense. This paradox explains why the European Parliament has stressed the need to assess the appropriateness to virtual worlds of the existing provisions of private international law applicable in the EU¹⁶⁹. Such provisions are included in the Brussels I Regulation¹⁷⁰ (jurisdiction), and Rome I¹⁷¹ and Rome II¹⁷² Regulations (applicable law).

Notwithstanding the need to revise those instruments and elaborate fit-for-purpose connecting factors, adjudication of justice in virtual worlds can be facilitated with mechanisms provided by the platforms themselves. As further explained in 4.1, virtual worlds are self-regulated environments where, on the basis of the membership agreements, IVWP are (contractually) entitled (they have the right not the obligation, as usually stipulated in the agreements) to act as regulators and supervisors. In this regard, the necessary adjustments to virtual worlds of the notice and action procedures such as those provided for in art. 16 DSA¹⁷³, or internal complaint-handling mechanisms (art. 20 DSA and art. 11 P2B Regulation) should be studied. While not all, these mechanisms can facilitate the resolution of many of the disputes that may raise in virtual worlds. Adjustments to these procedures should ensure that the right to a fair trial of the parties involved in the dispute is safeguarded¹⁷⁴.

¹⁶⁸ Cécile Pellegrini, 'Applicable Law in the Metaverse: A European International Private Law Perspective' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 375-397; Ana Mercedes López Rodríguez, 'Law Applicable to Virtual Real Estate in the Metaverse' (2024) *Proceedings of the International Congress Towards a Responsible Development of the Metaverse, Alicante, 13-14 June 2024*; Aurelio López-Tarruella Martínez, 'Jurisdicción y ley aplicable a las cuestiones de Propiedad Intelectual en el Metaverso' in Aurelio López-Tarruella Martínez (ed), *Protección y gestión de la propiedad intelectual en el metaverso* (REUS 2023).

¹⁶⁹ European Parliament (n 55), points 13-16.

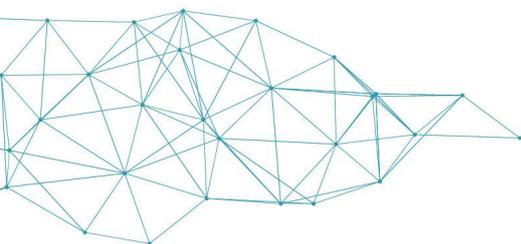
¹⁷⁰ Regulation 1215/2012 of the European Parliament and of the Council of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters [2012] OJ L 351.

¹⁷¹ Regulation 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I) [2008] OJ L 177.

¹⁷² Regulation 864/2007 of the European Parliament and of the Council of 11 July 2007 on the law applicable to non-contractual obligations (Rome II) [2007] OJ L 199.

¹⁷³ As an example, in Meta Horizon Worlds, you can report someone if you think the person is not complying with the Code of conduct for virtual experiences [Meta, 'Report someone in Meta Horizon Worlds' (Meta, 2024) <<https://www.meta.com/es-es/help/quest/articles/horizon/safety-and-privacy-in-horizon-worlds/report-someone-horizon-worlds/>> accessed 12 November 2024].

¹⁷⁴ Ana Mercedes López Rodríguez, *Resolución de Conflictos en el Metaverso* (Tecnos, 2025); Pietro Ortolani, 'Dispute resolution and the metaverse' in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 361-375; Federico Bueno de Mata, 'Del metaverso a la metajurisdicción:



4. The European Digital Acts and the metaverse

The metaverse is still a “world” under construction. As it has been noted above, several alternative governance models, development strategies, and business models are possible in the process ahead of devising and building up the metaverse. Both centralized and decentralized models coexist so far; projects led by private entities, although being more prominent and frequent, coexist with government-supported ones; and a wide variety of purposes, applications, and scopes are being explored by initiatives at different stages of development.

Acknowledging such a condition of the metaverse as a medium under construction has two relevant repercussions in assessing the applicability of the European Digital Acts. On the one hand, their applicability can only be assessed in relation to the possible governance and business models that can be envisaged at this point of time. Nonetheless, the metaverse may evolve differently and depart accordingly from the existing legal framework. On the other hand, and as a consequence, should the current legal framework set by the European Digital Acts be deemed by metaverse actors inadequate, deterring, or too burdensome, market trends may be directed precisely towards alternative models outside the perimeters of the legal framework. Any analysis of the applicability as well as the effectiveness of the European Digital Acts either to promote or to control the responsible development of the metaverse must acknowledge and properly consider these market dynamics. A hint of this tendency can already be observed in the development of virtual world platforms administered by decentralized autonomous organizations (DAOs), such as Decentraland¹⁷⁵.

In the profuse and expanding EU legal and regulatory scene for the digital economy, our assessment of applicability and adequacy will be focused on three of the five so-called European Digital Acts: the DSA, the DMA and the AI Act¹⁷⁶. There are key components of the European approach to the digital economy and the assessment will confirm whether they do also address the building blocks of the metaverse. The DSA and DMA are specially related to interactive virtual world platforms and other many players of the metaverse. Having in mind the connection both instruments have with it, the application of the P2B Regulation to virtual worlds is also addressed.

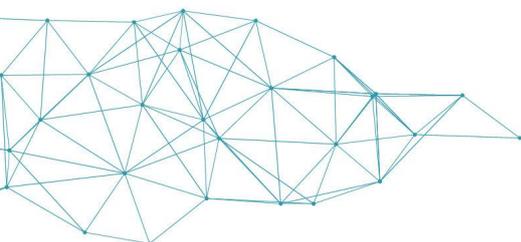
The impact of the AI Act is less tangible: its provisions does not generally apply to the metaverse and virtual worlds as “spaces”, but the AI Act is relevant to govern the development of practices, the performance of activities and even the “creation” of non-human avatars driven by AI systems. Thus, developers of certain XR devices, and certain IVWP where emotional recognition systems are used can be considered to carry out prohibited practices or to develop high-risk AI systems. Additionally, IVWP can be subject to transparency obligations in art. 50 when users are interacting with NCP-like avatars.

As described above (section 2), the development of the metaverse is essentially based on and driven by four main categories of actors: infrastructure providers, virtual world platforms (IVWP), developers (CVWD) and users.

desafíos legales y métodos para la resolución de conflictos generados en realidades virtuales inmersivas’ (2022) 27 *Revista de Privacidad y Derecho Digital* 19-59.

¹⁷⁵ Decentraland, ‘Governance’ (*Decentraland*, 2024) <<https://decentraland.org/governance>> accessed 12 November 2024.

¹⁷⁶ The other two European Digital Acts are the Data Act and the Data Governance Act. Both are excluded from our research because, as mentioned in the Introduction, it seems less plausible to include providers of virtual worlds in their material scope of application and therefore, the development of the metaverse is less depending upon these Acts’ policy choices.



From a regulatory point of view, the role of infrastructure providers who support and provide operability, computing and scalability services in the metaverse, is rather familiar. From simple network operators to cloud storage providers, developers of devices, or blockchain service providers, these providers do not necessarily present distinctive features that may dramatically require a different regulatory approach. Even if the evolution of the market structure may raise in the future special concerns demanding specific regulatory actions, from the perspective of a pure legal conceptualization, these infrastructure providers fit into existing regulations and do not seem to pose unmanageable challenges at this stage.

Thus, attention should be focused on those actors that more prominently star in the development of the metaverse with its distinctive characteristics: the IVWP and its relationships with developers (CVWD) and users.

Notwithstanding the decentralization aspiration that some advocate for, the building of the metaverse at this stage does not seem to differ substantially to the expansion and consolidation of the platform economy driven by contract-based centralized models (platforms)¹⁷⁷. IVWP provide information society services, even if more colorful, sophisticated, and evolved. And when unpacking the relationships established between the IVWPs and the users (developers and users) and the interaction so enabled between users and developers, a clear image of an online platform (as defined by the DSA) surfaces.

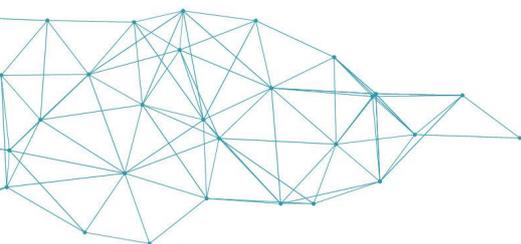
While the assumption that IVWPs are majorly providers of online platforms¹⁷⁸ renders the DSA (as well as the DMA) easily and directly applicable, the presence or the emergence of alternative models led by DAOs poses significant challenges to the application of the European Digital Acts. On the one hand, unless embedded in (or being recognized by law as such) existing forms of companies or business associations, DAOs are not recognized as a distinct and separate legal person¹⁷⁹. That diverges from the underlying logic of the due diligence obligations imposed by the European Digital Acts to certain providers. So, unless recognized by law a legal entity susceptible of being subject (distinctly from its partners) to rights and obligations, provider's due diligence obligations cannot apply¹⁸⁰. On the other hand, under the same conception of no central/identified operator, decentralized/distributed models do not fit into the concept of online platform as centralized models. As described by the DSA, but even more clearly by the P2B

¹⁷⁷ As we have previously advocated, understanding this (multifaceted) functional profile of platforms and their contractually based anatomy is essential to design an appropriate regulatory strategy and to design an adequate formula to address and largely resolve the dilemma of platform liability [Teresa Rodríguez de las Heras Ballell, 'The Legal Anatomy of Electronic Platforms: A Prior Study to Assess the Need of a Law of Platforms in the EU' (2017) 1/3 The Italian Law Journal 149-176].

¹⁷⁸ Art. 3(i) DSA: "*online platform*" means a hosting service that, at the request of a recipient of the service, stores and disseminates information to the public, unless that activity is a minor and purely ancillary feature of another service or a minor functionality of the principal service and, for objective and technical reasons, cannot be used without that other service, and the integration of the feature or functionality into the other service is not a means to circumvent the applicability of this Regulation"

¹⁷⁹ See, discussing the legislative proposals of Malta: Max Ganado and others, 'Mapping the Future of Legal Personality - MIT Computational Law Report' (MIT, 2020) <<https://law.mit.edu/pub/mappingthefutureoflegalpersonality>>. Also: US State of Wyoming, 'Supplement to the Wyoming Limited Liability Company Act' (2023) <https://sos.wyo.gov/Forms/WyoBiz/DAO_Supplement.pdf>. Similarly, the Tennessee act treats registered DAOs as LLCs; recently, the Utah Decentralized Autonomous Organizations Act was passed. Previously, Vermont had adopted an act creating a new type of business entity, this is, Blockchain-Based Limited Liability Companies (BBLLCs).

¹⁸⁰ In this regard, we agree with the European Parliament on the need of the Commission to study the added value of a possible legal framework for DAOs [European Parliament (n 55), point 20].



Regulation, platforms operate on the basis of contractual relationships between the operator of the platform (service provider) and the users¹⁸¹.

Under 4.1 below, we elaborate this assumption and explore whether, both from a policy perspective and from an analytical point of view, the DSA and the DMA, together with the P2B Regulation, apply and, if so, whether they are suited to IVWPs. In 4.2, we test the applicability and the adequacy of certain due diligence obligations under DSA, notably, content moderation obligations, in the metaverse. Finally, in 4.3, an analysis of the provisions in the AI Act that may affect the activities of the metaverse main actors will be provided.

4.1. The metaverse as a platform economy: the application of the DSA and the DMA

In the context of the creation of a Digital Single Market for Europe¹⁸², the European Union has understood the essential role that platforms play in the digital society and the need to ensure a suitable environment for their development and consolidation¹⁸³.

On the one hand, platforms are drivers of innovation and growth and constitute a fundamental strategic component for the region's competitiveness. On the other hand, platforms occupy a critical position in an increasingly visible strategy of co-regulation, involvement of intermediaries in the prevention and protection of rights, and the implementation of voluntary enforcement mechanisms.

Since Directive 2000/31 on electronic commerce (ECD)¹⁸⁴, which has been the centerpiece and backbone of the regulatory framework for digital services in the Union and the driver of their expansion and development over the last two decades, the digital economy has been profoundly transformed, evolving into a platform economy and expanding dramatically beyond the cautious and discrete contours of the Directive. Just over two decades of the Directive, the presence and overwhelming expansion of platforms as major players in the contemporary digital economy (a "platform economy")¹⁸⁵, have put this cornerstone of the European regulatory framework to the test. The profound transformation of the digital economy to today's platform economy, and a truly explosive expansion of artificial intelligence, needed to recalibrate the foundations on which the European Union had solidly anchored the growth of digital services and markets. It is our understanding that this evolution is a prelude to an emerging next evolutionary stage driven by immersive technologies and virtual worlds.

While the DSA and the DMA, their rationale, concepts, and rules, have been conceived, drafted, and adopted to face the challenges of the platform economy, absent

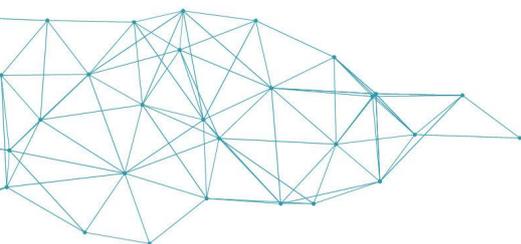
¹⁸¹ Art. 2(2) P2B Regulation: "online intermediation services' means services which meet all of the following requirements: (a) they constitute information society services within the meaning of point (b) of Article 1(1) of Directive (EU) 2015/1535 of the European Parliament and of the Council; (b) they allow business users to offer goods or services to consumers, with a view to facilitating the initiating of direct transactions between those business users and consumers, irrespective of where those transactions are ultimately concluded; (c) they are provided to business users on the basis of contractual relationships between the provider of those services and business users which offer goods or services to consumers".

¹⁸² European Commission, 'A Strategy for Europe's Digital Single Market' (2015) COM(2015) 192 FINAL.

¹⁸³ European Commission, 'Online Platforms and the Digital Single Market. Challenges and opportunities for Europe' (2016) COM(2016) 288 FINAL.

¹⁸⁴ Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market [2000] OJ L 178.

¹⁸⁵ As we have argued in previous works, for example, among the most recent and precisely on the occasion of the DSA proposal: Teresa Rodríguez de las Heras Ballell, 'The Background of the Digital Services Act: Looking Towards a Platform Economy', (2021) 22(1) ERA Forum 75-86.



or poorly addressed in the ECD and subsequent legislation, the virtual worlds and immersive technologies have gained popularity and stormed in the global regulatory scene when the policy debate had already crystalized in the solutions embedded in these two instruments.

Thus, it is reasonable to assume that, even if they have not gone totally unnoticed for the European regulator, the DSA and the DMA have not been purportedly designed for a digital society of virtual worlds and immersive technologies¹⁸⁶. Nonetheless, that does not suffice to deny the potential applicability of such rules. On the contrary, to the extent that sufficient and convincing similarities among actors, services, legal transactions, or market structure can be spotted, the new Digital Acts should naturally extend their applicability thereto¹⁸⁷. The features of virtual worlds, some of them of particularly distinctive character, might invite a warier and reluctant stance though. Therefore, we propose a two-fold analysis: firstly, at a policy level; and secondly, in terms of scope, concepts, and rules.

As anticipated above, at the current state, the development of the metaverse seems to depart from an idealized model of an interoperable decentralized medium. On the contrary, the metaverse is expanding thrust by multiple autonomous platforms, virtual worlds, and providers representing different governance and business models. Although decentralized and centralized models coexist, the presence of centralized platforms is undeniable and their role in the construction of the emerging world is paramount.

The policy behind the DSA (and the DMA) can, to that extent, naturally be extended over the main actors of the metaverse: the IVWP. This extended applicability can be supported from three angles. Functionally, IVWP acts as “online platforms” that set the environment where metaverse experiences will take place, define the rules for creating, accessing or interacting in the available virtual worlds (although some virtual worlds can operate as separate self-regulated environments as well, they need to fit into and comply with the platform policies), provide services and tools for creators and developers, and supervise and moderate users’ activity and content as per the applicable policies (a). Contractually, the communities of users and developers join the virtual worlds by concluding a contract with the IVWP (b). Conceptually, IVWP fits into the legal definition of online platforms and, in some cases, specifically, online intermediation service providers (c).

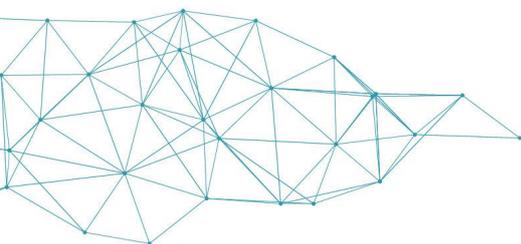
4.1.1. Private ordering and IVWP

Beyond enhancing the provision of digital services by leveraging their network efficiencies, economies of scale and value creation benefits, platforms aspire to create contract-based “private orders”¹⁸⁸. Within a huge variety of business models, platform operators act as (contractual) regulators by adopting platform rules and policies, monitoring compliance and sanctioning infringements (under a centralized model to monitor or, more often,

¹⁸⁶ Cristina Poncibò and Luigi Cantisani, 'E-commerce in Virtual Worlds: Digital Service Act', in Larry DiMatteo and Michel Cannarsa (eds), *Research Handbook on the Metaverse and Law* (Edward Elgar 2024) 245-261.

¹⁸⁷ “In relation to the protection and enforcement of the rights of individuals and companies operating in virtual worlds, the Digital Services Act (DSA)15 and the Digital Markets Act (DMA) introduce a comprehensive system of accountability and obligations for online platforms” [European Commission (n 43), p. 5].

¹⁸⁸ This thesis has been defended and reiterated in previous works by the co-author. We refer, for example, to one of the most recent ones: Teresa Rodríguez de las Heras Ballell, 'Las Plataformas: Nuevos Actores (y Reguladores) de la Actividad Económica' in *Derecho y Política ante la Pandemia: Reacciones y Transformaciones. Tomo II. Reacciones y Transformaciones en el Derecho Privado* (Anuario de la Facultad de Derecho de la Universidad Autónoma de Madrid, 2021) 403-417.



applying a decentralized P2P monitoring mechanisms, such as reputational mechanisms, user's report system, or flagging models, and adopting sanction policies), facilitating dispute resolution and providing systems to create and preserve reputation.

Therefore, it is argued that platforms are contract-based self-regulated digital environments that aims to emulate a "private legal system". On the basis of the membership agreement (concluded between the platform operator and the users), the platform operator is entitled to act as a (contractual) regulator, a (contractual) supervisor, and even to facilitate dispute resolution among users.

The DSA, unlike the minimalistic ECD, acknowledges, at least indirectly, that online platforms are self-regulated environments where users abide by the terms and conditions, policies, procedures, and community rules produced by the platform operator. Article 14(1)¹⁸⁹ DSA is revealing of that legal assumption. Even more, by recognizing that providers shall include in their terms and conditions details on content moderation and internal complaint-handling, the DSA is accepting, and indeed elaborating in the subsequent provisions as due diligence obligations of such providers, that platforms (platform operators) are (contractual) supervisors and facilitators of dispute resolution.

Platform models differ amply and vary significantly.¹⁹⁰ Therefore, some platforms correspond to mere intermediaries enabling the interaction among users while others intensively perform their contractual functions as regulators, supervisors and trust generators.

Functionally, IVWP create and govern a "space" where users interact, work, create, produce, buy and sell, and "live". Access criteria, conduct rules, functionalities, performance standards, and infringement policies are defined by the IVWP and accepted by users upon the conclusion of the membership agreement – opening an account, creating an avatar, joining a community, "creating" a virtual world. Hence, users' activities are to abide by the rules of the platform (IVWP), in general, and the virtual worlds, in particular (when adding specific rules) they belong to.

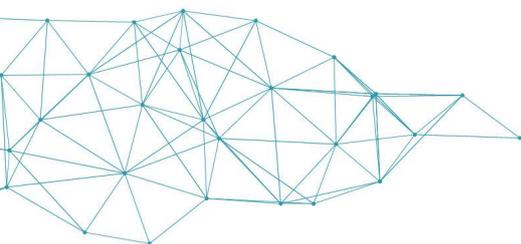
Diving into the profuse terms and conditions of any of the most popular IVWP, users find clear and detailed rules governing their prospective membership to the virtual worlds.¹⁹¹ IVWP can build up one virtual world or host several virtual worlds or metaverse experiences, created by the own IVWP or developed by developers (users) and hosted by the platform.

4.1.2. Membership agreement to join virtual worlds as platforms: B2C and P2B relationships

¹⁸⁹ Article 14(1) DSA: "Providers of intermediary services shall include information on any restrictions that they impose in relation to the use of their service in respect of information provided by the recipients of the service, in their terms and conditions. That information shall include information on any policies, procedures, measures and tools used for the purpose of content moderation, including algorithmic decision-making and human review, as well as the rules of procedure of their internal complaint handling system. It shall be set out in clear, plain, intelligible, user-friendly and unambiguous language, and shall be publicly available in an easily accessible and machine-readable format".

¹⁹⁰ In detail: Teresa Rodríguez de las Heras Ballell, *El Régimen Jurídico de los Mercados Electrónicos Cerrados (e-marketplaces)* (Marcial Pons, 2006).

¹⁹¹ Roblox's terms and conditions provide illustrative examples [Roblox Team, 'Terms of Use' (Roblox, 2024) <<https://en.help.roblox.com/hc/es/articles/203313410-T%C3%A9rminos-de-uso-de-Roblox>> accessed 12 November 2024].



Like users joining an online platform, users and developers consent to join the environment provided by the IVWP and/or some of their functionalities, experiences, or services. As familiar as creating an account to join a social network today, users create their account, upgraded or embodied in an avatar, to interact, play, create, contribute or socialize in the virtual world. Both professional and non-professional profile are in principle possible. Then, some users can simply enjoy the experience and consume products and services, others can be involved more actively in creative and generative activities, and others can primarily be acting as developers who produce digital assets or services, create virtual worlds, and develop metaverse experiences.

The interaction among metaverse participants resemble B2B, B2C or P2P relationships, as well as G2C relations in those State-based metaverses. A growing use of AI-driven avatars (emulating NCP models) will render M2M more frequent and widespread. Nonetheless, the activity of users in the metaverse seems to be more active, creative, and generative. Thus, we might be facing a situation similar to the emergence of *prosumers* in the sharing-economy models¹⁹², as users are rarely passive participants and more often active creators.

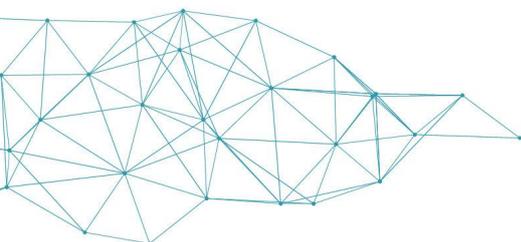
Considering the foregone, the relationship between the IVWP and the users (membership agreements) would be categorized as a B2C contract – with those users acting for purposes which are outside their business, trade or profession – or as a B2B one when the user is a developer or to the extent that the user act for business or professional purposes. In fact, and more precisely, the latter may be described as a P2B (Platform-to-Business) relationship. As explained in Section III, the P2B Regulation may be applicable to IVWP in their relationship with developers and professional users.

This P2B Regulation stems from the acknowledgment of the importance of platforms for innovation, entrepreneurship, social welfare and access to new markets, from which stems the concern about the intense, growing and ever-increasing economic dependence of companies ('professional users') established in the EU on the platforms they use to offer their products and services to consumers ('located in the Union')(Art. 1.2). It is thus an effort to iron out the frictions of the platform economy without compromising the advantages of its take-off and consolidation in the common market.

As per the P2B Regulation, some IVWP may be deemed "online intermediation service providers" and fall under its personal scope of application. Although the P2B Regulation eludes the use of the term "platform", it defines the providers of "online intermediation services" as providers of information society services that allow business users to offer goods and services to consumers "with the objective of facilitating the initiation of direct transactions" and "on the basis of contractual relations between the service provider and the professional users". As explained before, that makes up the anatomy of platforms¹⁹³.

¹⁹² Oksana Mont and others, 'A Decade of the Sharing Economy: Concepts, Users, Business and Governance Perspectives' (2020) 269 *Journal of Cleaner Production*.

¹⁹³ Sharing very obvious legislative policy purposes with the P2B Regulation, the ELI (European Law Institute) *Model Rules on Online Intermediary Platforms* choose to standardize the use of the term "platform" in the body of the legislative proposal and to determine the scope of application of the instrument. The ELI Project for Model Rules on Online Intermediary Platforms was approved by the ELI Council on 7 September 2019. Teresa Rodríguez de las Heras joined the ELI Project Team in 2016. The rapporteurs of the Project are Christoph Busch, Gerhard Dannemann, Hans Schulte-Nölke, Aneta Wiewiorowska-Domagalska, Fryderyk Zoll. The views expressed in this paper are solely those of the authors and do not necessarily represent the position or opinion of the Project team [Σ]. In particular, the efforts to proceed to a proper conceptualization, delimitation and definition of platforms in the project represent an important milestone in the terminological alignment of the European regulatory framework [Teresa Rodríguez de las Heras Ballell, 'Article 2. Definitions', in Christoph



Business users are defined in the P2B Regulation as “any private individual acting in a commercial or professional capacity who, or any legal person which, through online intermediation services offers goods or services to consumers for purposes relating to its trade, business, craft or profession”. So, it uses the traditional distinction between those acting for purposes relating to their business, trade or profession (traders) and those acting for purposes outside these spheres and, therefore, for non-commercial, personal, or household purposes.

Those IVWP providing virtual worlds and/or metaverse experiences where business users (developers and other traders) offer goods and services (including experiences, digital assets, skins, metaverse assets, services of any kind) to consumers (metaverse participants who qualify as consumers) fall under the category of online intermediation service providers. The P2B Regulation applies, provided that other connecting factors are met.

Certainly, it can be argued that in the Metaverse the determination whether a IVWP is a business user can raise complexities. Criteria developed by CJEU in the light of all relevant circumstances of each individual case shall be taken into due consideration¹⁹⁴, however they clearly need an adaptation to the new technology framework.

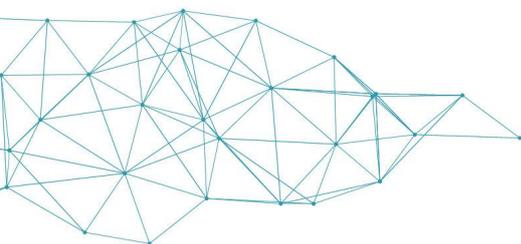
The application of the P2B Regulation implies that the terms of use of the platform and of the marketplace must comply with the requirements of the Regulation on terms and conditions, restriction and suspension, ranking, ancillary goods and services, differentiated treatment, access to data, and, among others, complaint-handling mechanisms and dispute resolution. A quick review of the terms of use of popular virtual worlds platforms suggests that this is a pending issue for emerging businesses in the metaverse¹⁹⁵.

In assessing the full applicability of the P2B Regulation to the IVWP, the territorial scope may be more challenging. Pursuant to Article 1(2), it shall apply to “online intermediation services and online search engines provided, or offered to be provided, to business users and corporate website users, respectively, that have their place of establishment or residence in the Union and that, through those online intermediation services or online search engines, offer goods or services to consumers located in the Union, irrespective of the place of establishment or residence of the providers of those services and irrespective of the law otherwise applicable”.

Busch and others (coord.) *Discussion Draft of a Directive on Online Intermediary Platforms. Commentary* (Jagiellonian University Press, Krakow 2019) 41-53].

¹⁹⁴ Namely and among others, the *Kamenova* case [Case C-105/17, *Kamenova* [2018] ECLI:EU:C:2018:808]. In particular, par. 38 identifies the following criteria to determine whether a person is acting as a trader: “[...] whether the sale on the online platform was carried out in an organised manner, whether that sale was intended to generate profit, whether the seller had technical information and expertise relating to the products which she offered for sale which the consumer did not necessarily have, with the result that she was placed in a more advantageous position than the consumer, whether the seller had a legal status which enabled her to engage in commercial activities and to what extent the online sale was connected to the seller’s commercial or professional activity, whether the seller was subject to VAT, whether the seller, acting on behalf of a particular trader or on her own behalf or through another person acting in her name and on her behalf, received remuneration or an incentive; whether the seller purchased new or second-hand goods in order to resell them, thus making that a regular, frequent and/or simultaneous activity in comparison with her usual commercial or business activity, whether the goods for sale were all of the same type or of the same value, and, in particular, whether the offer was concentrated on a small number of goods”.

¹⁹⁵ Terms of use of Decentraland can be consulted here: Decentraland Team, ‘Terms of Use’ (*Decentraland*, 2024) <<https://decentraland.org/terms/>> accessed 12 November 2024. Compliance with EU legal standards is doubtful. To start with, general information requested in art. 5 ECD, and about the entity behind Decentraland cannot be found anywhere. A similar assessment can be made of The Sandbox [The Sandbox Team, ‘Terms of Use’ (*The Sandbox*, 2024) <<https://www.sandboxdao.com/terms-of-use>> accessed 12 November 2024].



While the establishment or residence of the IVWP is irrelevant for the application, the place of establishment or residence of the business user as well as the location of the consumers are relevant connecting factors.

As in the DSA, and with a diverse wording in the GDPR, the key problem in determining the territorial scope is the meaning of “offer services to” recipients in the Union. In the DSA though, the notion of “offering to” is more elaborate and two additional definitions are included in the Act (Art. 3.d and e DSA). Having in mind the coincidental objectives pursued by both instruments, it is our opinion that these definitions should be applied by analogy to the P2B Regulation. This would ensure that both instruments are applied in the same situations.

First, “to offer services in the Union” means enabling natural or legal persons in one or more Member States to use the services of a provider of intermediary services that has a substantial connection to the Union.

That leads to the second definition describing what a substantial connection to the Union means. So, second, “substantial connection to the Union” means a connection of a provider of intermediary services with the Union resulting either from its establishment in the Union or from specific factual criteria, such as: a significant number of recipients of the service in one or more Member States in relation to its or their population; or the targeting of activities towards one or more Member States. None of these criteria are definitive and conclusive.

Hence, the approach based on a list of relevant indicia and factors that courts used to employ to establish territorial connection in digital activities seems to be still pertinent. In this regard, traditional case law on the application of the “targeting criteria” to international consumer contracts is a starting point¹⁹⁶, but needs to be updated to the new medium: at present, differently from (anonymously) transacting in a website (browsing or navigating subject to terms of use accepted by browse-wrap agreements)¹⁹⁷, visiting a virtual world necessarily requires users to previously register in the platform. Thus, for the P2B Regulation and the DSA to be applicable to an IVWP, residents in the EU must be able to open an account. This however might not be the exclusive requirement: the thematic and language of the virtual world, other indicia such as currency, contact details, targeted advertisement or other territorial references may lead to considered that it is not directed to European residents.

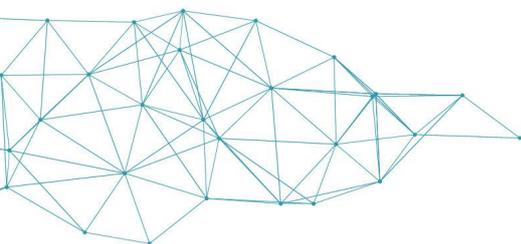
IVWP also fall, as “online intermediation service providers”, under the DSA provisions applicable, in particular, to online platforms allowing consumers to conclude distance contracts with traders¹⁹⁸. Both instruments are made compatible each other: Article 2(3) explicitly acknowledges that the DSA applies without prejudice of the P2B Regulation. And, with the same formula (“without prejudice”), Article 30(4) of the DSA (on the traceability of traders) refers to the P2B Regulation¹⁹⁹.

¹⁹⁶ Case C-585/08 and C-144/09, *Pammer and Hotel Alpenhof*, ECLI:EU:C:2010:740, para. 83-84.

¹⁹⁷ Teresa Rodríguez de las Heras Ballell, 'Terms of Use, Browse-Wrap Agreements and Technological Architecture: Spotting Possible Sources of Unconscionability in the Digital Era' (2009) 2 *Contratto e Impresa*. Europa 841-861.

¹⁹⁸ Art. 29-32 DSA.

¹⁹⁹ While the interplay is evident it raises some complexities that may be addressed and smoothed out. In fact, the Commission, according to art. 18 P2B Regulation, is to evaluate the P2B Regulation and report to the European Parliament, the Council and the European Economic and Social Committee. To that end and in its evolution, the Commission shall take into account inter alia, the opinions and reports presented to it by the group of experts for the Observatory on the Online Platform Economy. The opinions and views expressed in the paper are exclusively of their co-authors. Teresa Rodríguez de las Heras Ballell, member of the Expert Group to the Observatory on the Online Economy and leader of the Work Stream 8 on the P2B Regulation evaluation is



According to Article 30 DSA (traceability of traders), IVWP should implement KYBU (Know-Your-Business-Users) mechanisms. Consequently, they should ensure that traders can only use those platforms if, prior to the use of their services for those purposes, they have obtained certain information, where applicable to the trader. This information includes the address of the trader. Hence, the establishment or the residence of the trader can be traced and known.

Again, the controversy over the categorization of CVWD as professional users (traders) as discussed above emerges and obscures the applicability of these instruments in the metaverse. Besides the obligation to provide the requested information by platforms for the purposes of enabling their compliance with Article 30 DSA, CVWD acting as traders have the obligation to provide these identification data as well in the context of their interaction with consumers (for example in distance and off-premises contracts)²⁰⁰. In fact, "a failure to provide information on the trader's identity, or the provision of incorrect data, would constitute a breach of Directive 2011/83 on consumer rights. It could also constitute a misleading practice under Directive 2005/29 on unfair commercial practices, to the extent that it affects the consumer's transactional decision"²⁰¹.

As previously mentioned, compliance of these requirements should require decentralized platforms to amend their currently in-force practices concerning registration of developers (CVWD) in their platform. To our knowledge, opening of a crypto wallet with an e-mail address is enough to obtain a user account in the most popular decentralized virtual world platforms. This practice does not ensure the identification of the person behind such e-mail address. It is doubtful that this practice is in line with the KYBU requirement and could enable traceability.

Equally challenging seems to be the determination of the "location" of the consumer. Complexities arise from two factors.

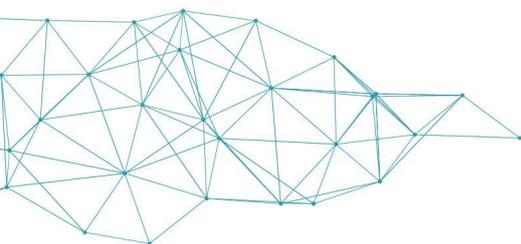
On the one hand, the "digitality" factor²⁰² that is indeed common to the expansion of the digital economy in general and the platform economy in particular. Despite the

not expressing the opinion of the Commission or the Expert Group members but her personal views [Teresa Rodríguez de las Heras Ballell, 'Work Stream 8 Contribution to Evaluation of P2B Regulation: Concept Note' (Observatory on the Online Platform Economy, 2022) <https://platformobservatory.eu/app/uploads/2022/02/Work_stream_8_Contribution_to_Evaluation_of_P2B_Regulation_concept-note.pdf>].

²⁰⁰ Art. 6 Directive 2011/83 [Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights (Consumer Rights Directive)[2011] OJ L304/64] lists the information to be provided to the consumer in off premises and distance contracts. Additional specific information requirements for contract concluded on online marketplaces are set out in Article 6a that was added to the CRD by Directive (EU) 2019/2161 [Directive (EU) 2019/2161 of the European Parliament and of the Council of 27 November 2019 as regards the better enforcement and modernization of Union consumer protection rules [2019] OJ L328/7]: "(b) the identity of the trader, such as his trading name; (c) the geographical address at which the trader is established and the trader's telephone number, fax number and e-mail address, where available, to enable the consumer to contact the trader quickly and communicate with him efficiently and, where applicable, the geographical address and identity of the trader on whose behalf he is acting; (d) if different from the address provided in accordance with point (c), the geographical address of the place of business of the trader, and, where applicable, that of the trader on whose behalf he is acting, where the consumer can address any complaints".

²⁰¹ European Commission, 'Commission Notice: Guidance on the interpretation and application of Directive 2011/83/EU of the European Parliament and of the Council on consumer rights (Text with EEA relevance)' (2021) C 525/1 <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021XC1229%2804%29>>, p. 28.

²⁰² Beyond the concept of globality or universality, intended to describe the expansion of international trade and the nature of cross-border transactions, the authors argue for the coining of a new concept that better reflects the genuine nature of digital activities, this is, "digitality" [Teresa Rodríguez de las Heras Ballell, 'The Emergence of Digital Communities: Generating Trust, Managing Conflicts, and Regulating Globality... Digitality' in Carol J Greenhouse and Christina L Davis (eds), *Landscapes of Law: Practicing Sovereignty in Transnational Terrain* (University of Pennsylvania Press 2020) 250-277].



difficulties to connect delocalized activities with territorial elements, that has not been an unsurmountable obstacle to apply and enforce European digital rules. Solutions to define territoriality in the digital economy have been developed. As previously mentioned, the DSA (Arts. 2(1) and 3) defines two key criteria to demarcate its sphere of application: “to offer services in the Union” and “substantial connection to the Union”. Beyond the complexities to apply these criteria, there is a background discussion on the risk of potential extraterritoriality of the Digital Acts given the policy options adopted to demarcate the sphere of application²⁰³.

On the other hand, the “spatiality” or “re-localizing” factor²⁰⁴ that distinctively and uniquely characterizes virtual worlds. Unlike the delocalizing effect of the digital economy to date, immersive technologies reverse this trend and stir a “sense of presence”. The metaverse seems to return to “places”, virtually recreated but profoundly sensed by participants as “places” where they “are”. The actual location of the users/consumers joining a metaverse experience may be less relevant if what becomes really significant and meaningful for the participants is the virtual “place”. Conceptually, this return to “spatiality” or “re-localization” trend is one of the most fascinating distinctive features of metaverse that may entail a radical transformation in our perception of virtual worlds and potentially in the regulatory strategy. That spatial-based approach does also lead to other intriguing consequences, such as dispute resolution systems adequate to virtual worlds (with settlement systems in the virtual worlds equating courts in State-based models), or self-regulation linked to “spatial” connecting factors. As previously explained, this would reduce the need to apply the poorly suited traditional private international law provisions to disputes in virtual worlds.

Given the two above-described complexities, it can be envisioned that the factor of “substantial connection to the Union” will play a decisive role in determining the applicability of European Digital Acts. As it happened in the initial stages of the digital economy (with the advent of internet in its infancy), factual criteria (other than a proven location of users) revealing connection with the EU shall likely be developed to provide certainty and predictability.

4.2. The DSA and virtual worlds

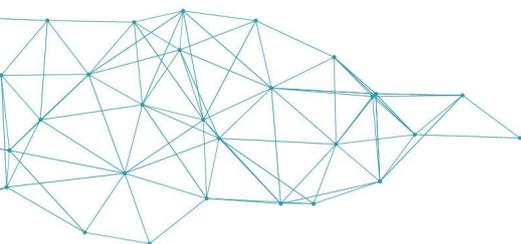
4.2.1. IVWP as online platforms under the DSA

Services provided by IVWP amount to be “information society services”, in so far as they are provided normally for remuneration, by electronic means, at the individual request of the recipient²⁰⁵; although certain distinctive features, such as the highly visual character, the experiential component, and the immersiveness goal, may require further consideration. Under the DSA, IVWP seem to fall under the scope of intermediary service providers (as hosting service providers) and “online platforms” because they store and

²⁰³ See, in relation to the AI Act: Aurelio López-Tarruella Martínez, ‘El futuro Reglamento de inteligencia artificial y las relaciones con terceros Estados’ (2023) 45 *REEI*.

²⁰⁴ This factor is described in Spanish as the factor of ‘relocalización’ in: Teresa Rodríguez de las Heras Ballell, ‘Unas primeras reflexiones jurídicas sobre el/los metaverso/s’ (FIDE, 2022) <<https://thinkfide.com/informe-fide-21-22/>>, p. 64.

²⁰⁵ Recital 5 DSA, recalling the definition of information society service in Directive 2015/1535.



disseminate information to the public²⁰⁶. Platforms such as Horizon Worlds or Roblox clearly meet these requirements.

That means that the set of provisions applicable to each category (due diligence obligations in Chapter III, Sections 1, 2 and 3) will stack on accordingly. This implies, firstly, that IVWP are to comply with all the basic due diligence obligations applicable to all provider of intermediary services (Section 1): to designate points of contact, and legal representatives in the Union; to include in the terms and conditions in clear, plain, intelligible, user-friendly, and ambiguous language (in machine-readable format) detailed information on content moderation and to act diligently in applying and enforcing such moderating restrictions; and to make publicly available reports on content moderation with the required information. Secondly, IVWP shall comply with the additional obligations applicable to hosting service providers, including online platforms (Section 2). These are particularly focused on content moderation functions: to put in place notice and action mechanisms; to provide statement of reasons to any user affected by a restriction adopted on the basis that the content was illegal or incompatible with the terms and conditions; to inform authorities of suspicions of criminal offences. Thirdly, unless they qualify as micro or small enterprises (a qualification that can nowadays meet many of the emerging metaverse-related companies²⁰⁷), IVWP shall comply with the additional due diligence obligations of online platforms,: to implement internal complaint-handling systems; to inform users and engage in good faith, if applicable, with the selected certified out-of-court dispute settlement body to resolve disputes arising from or not resolved by the complaint-handling system; to take the necessary measures to give priority to and decide with no delay notices submitted by trusted flaggers, to adopt measures of protection against misuse of notice mechanisms; to comply with reporting obligations in the terms required by the law; to avoid misleading or decision-distorting interface design; to apply certain obligations relating to online advertising as well as to recommender systems; and to provide high level of protection for minors.

As explained in the previous section, should IVWP enable transactions between professional users and consumers in their eMarketplaces, due diligence obligations in Section 4 will apply together with the P2B Regulation.

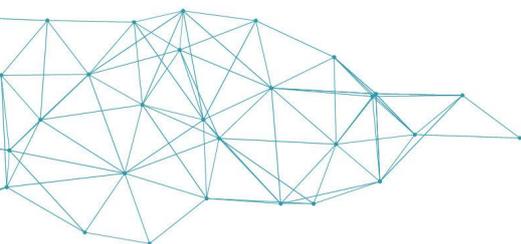
Finally, it is doubtful that the provisions in Section 5 DSA would apply to all existing IVWP nowadays. This is so because none of them is so popular and solidly entrenched in Europe as to meet the requirements in art. 33 (1) to be designated a very large online platform: “a number of average monthly active [users] in the Union equal to or higher than 45 million”²⁰⁸. However, according to the information available in various sources, certain of them may meet this threshold: Roblox, Fortnite and Minecraft²⁰⁹.

²⁰⁶ Art. 3(i) DSA: “online platform’ means a hosting service that, at the request of a recipient of the service, stores and disseminates information to the public, unless that activity is a minor and purely ancillary feature of another service or a minor functionality of the principal service and, for objective and technical reasons, cannot be used without that other service, and the integration of the feature or functionality into the other service is not a means to circumvent the applicability of this Regulation”.

²⁰⁷ According to the information provided in LinkedIn, Decentraland has between 51 and 200 employees, and the Sandbox between 200 and 500.

²⁰⁸ While some of the services provided by Meta has been designated as VLOP (Facebook, Instagram, WhatsApp), Meta Horizon Worlds is not covered. In fact, it was reported to have less than 200.000 users in October 2022, so it is still far away from reaching the required number of European users. [Ashley Capoot, ‘Meta Horizon Worlds Metaverse Losing Users, Falling Short of Goals’ (CNBC, 2022) <<https://www.cnbc.com/2022/10/15/meta-horizon-worlds-metaverse-losing-users-falling-short-of-goals.html>> accessed 12 November 2024].

²⁰⁹ According to *Subscribed.fyi*, Roblox has 214 millions, Minecraft has 166 millions and Fortnite has 326 million users monthly worldwide in 2024 [Subscribed.fyi, ‘Shaping Our World: 52 Metaverse Statistics for 2024’



4.2.2. Content moderation in the Metaverse: the adequacy of the DSA provisions

As previously mentioned, the DSA crystallizes the regulatory essence of the platforms as contract-based legal systems, which define their conditions, policies, procedures and internal mechanisms (Art. 14 DSA). And it is on the basis of the acceptance of this regulatory and supervisory autonomy that the DSA specifies the rules aimed at ensuring reasoned decisions, transparency, the effective management of complaints, conflict resolution, measures to limit misuse or report suspected offences, the traceability of traders or even efforts to verify the reliability of information. These are not mere obligations capriciously imposed on a service provider, but a recognition of its capacity to regulate, manage conflicts, prevent and resolve offences, limit the exercise of fundamental rights and freedoms in its space of interaction²¹⁰. In short, they are tailor-made obligations to subject the functions of true regulators, supervisors and generators of trust to certain rules.

Among these stacked due diligence obligations, Chapter III, Section 2 provides for some obligations related to content moderation applicable to online platforms, as hosting service providers. These mechanisms play a central role in obtaining actual knowledge or awareness for the purposes of the intermediary liability exemption²¹¹ (in particular, Art. 6 DSA).

IVWP, as online platforms, are subject, as per the DSA, to the content moderation due diligence obligations laid down in Articles 16 to 18 (Section 2): notice and action mechanisms, statement of reasons, and notification of suspicions of criminal offences.

Content moderation shall play a critical role in the responsible development of the Metaverse. It will play even a more relevant role than in the current platform economy as the distinctive features of immersive experience and virtual worlds may increase the exposure of users to risks²¹², increase vulnerabilities²¹³, stoke the pernicious effects of

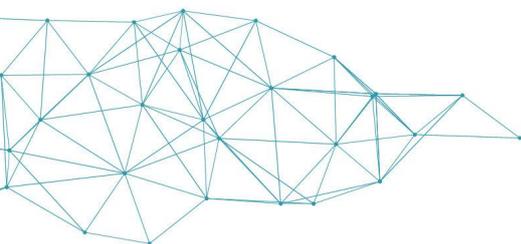
(*Suscribed.fyi*, 2024) <<https://suscribed.fyi/blog/shaping-our-world-52-metaverse-statistics-for-2024/>> accessed 12 November 2024]. Information of the percentage of those users who are residing in the EU has not been possible to find.

²¹⁰ As we have previously advocated, understanding this (multifaceted) functional profile of platforms and their contractually based anatomy is essential to design an appropriate regulatory strategy and to design an adequate formula to address and largely resolve the dilemma of platform liability [Rodríguez de las Heras Ballell (n 177)].

²¹¹ The core of the liability exemption regime is retained and placed at the center of the DSA, at the first level of a tiered model of obligations, but accompanied by several innovations, some of them subtle, others much more forceful and visible, which refine, refine and even update the liability rules on the basis of accrued market experience, case law and the enhanced interpretation of the regulatory framework. Thus, the 'good Samaritan' provision (art. 7); the tantalising solution, with as yet uncertain effects and scope, hidden in art. 6(3); and the range of rules governing notification and action mechanisms and the statement of reasons (Arts. 16 and 17) are the main novelties.

²¹² Brittan Heller and Avi Bar-Zeev, 'The Problems with Immersive Advertising: In AR/VR, Nobody Knows You Are an Ad' (2021) 1(1) *Journal of Online Trust and Safety*.

²¹³ Runze Hu, 'Understanding Children's Vulnerabilities in the Metaverse: The Role of the Online Community' (*London School of Economics and Political Science*, 2022) <<https://blogs.lse.ac.uk/parenting4digitalfuture/2022/06/15/metaverse-vrchat/>> accessed 12 November 2024.



illegal content or misinformation²¹⁴, or aggravate the misleading potential impact on users' decisions²¹⁵.

While the common complexities²¹⁶ of content moderation²¹⁷ in obtaining actual knowledge, assessing illegality or incompatibility with terms and conditions of content, or avoiding undue affecting freedom of expression, persist in virtual worlds; there are new challenges to tackle. The metaverse pose special challenges that may question or at least heavily stress out content moderation mechanisms, procedures, and rules as they are conceived and are working in the platform economy.

The logic underlying content moderation is strongly depending upon the operational, behavioral, and technological features of the current platform economy. Content is, if not exclusively, mainly in writing (posts, comments, reviews) or in audiovisual form (videos, podcast, music, pictures).

The first challenge of content moderation in the metaverse arises from the behavioral and multisensorial components of the user experience. Illegal activities or incompatible content can extensively be carried out in form of conversations and voice interactions, or simply as inappropriate behaviors of the avatars. The definition of content moderation in the DSA refers to 'specific item of information' considered illegal or incompatible with the platform's policies. Voice interactions or simple behavioral actions will be frequent sources of inappropriate conduct. Even more, they will very likely prevail over written communications considering the aspiration of the metaverse to replicate life spaces and real-time interaction analogous to those in our physical world. That raises two questions.

First, whether technologically virtual worlds will be designed, be programmed, and operate to enable the traceability of actions, the logged of all interactions, and therefore the review of past actions. Otherwise, the ephemeral character of a voice comment or behavior will render useless or, at least, unfeasible the implementation of content moderation. Besides, assessing the inappropriateness of actions, comments and behaviors in virtual worlds may be more dependent upon contextualization, or private perception given the surrounding circumstances of the metaverse experience.

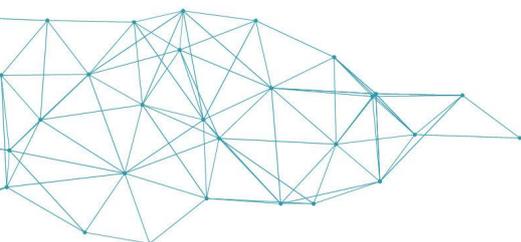
Second, even if all actions, comments, and interactions could be traced back and saved (both as a technological option and a strategical decision), the ex-post logic of content moderation is profoundly questioned. Content moderation measures are aimed to affect availability, visibility, and accessibility of the detected content upon obtaining actual knowledge or awareness. Should actions and comments in virtual worlds be not persistent,

²¹⁴ Allcott Hunt, Matthew Gentzkow, and Chuan Yu, 'Trends in the Diffusion of Misinformation on Social Media' (2019) 6(2) Research & Politics; Atlantic Council, 'What Happens When Toxic Online Behavior Enters the Metaverse?' (Atlantic Council, 2022) <<https://www.atlanticcouncil.org/news/transcripts/what-happens-when-toxic-online-behavior-enters-the-metaverse/>> accessed 12 November 2024.

²¹⁵ Inga K Trauthig and Samuel C Woolley, 'Addressing Hateful and Misleading Content in the Metaverse' (2023) 1 Journal of Online Trust and Safety, 1-20.

²¹⁶ Tarleton Gillespie and others, 'Expanding the Debate about Content Moderation: Scholarly Research Agendas for the Coming Policy Debates' (2020) 9(4) Internet Policy Review.

²¹⁷ Art. 3(t) Regulation DSA: "*content moderation*' means the activities, whether automated or not, undertaken by providers of intermediary services, that are aimed, in particular, at detecting, identifying and addressing illegal content or information incompatible with their terms and conditions, provided by recipients of the service, including measures taken that affect the availability, visibility, and accessibility of that illegal content or that information, such as demotion, demonetisation, disabling of access to, or removal thereof, or that affect the ability of the recipients of the service to provide that information, such as the termination or suspension of a recipient's account".



ex-post measures become unnecessary. That may diminish the effectiveness of content moderation and/or undermine the confidence perception of users.

Naturally, many other pieces of content in the metaverse can be easily addressed with the tools and under the logic of content moderation – such as an illegal advertising posted in a virtual building, an illegal activity carried out in a villa, an infringing digital object, or a wrongdoing avatar.

If the traditional measures of content moderation become less effective or advisable, IPVW may require reinforcing, on the one hand, preventive measures to be imposed and, on the other, to focus moderation efforts on ex-post deterring sanctions.

Focusing content moderation on preventive measures, especially if they start to be more intensely driven by predictive analysis of potential future behaviors, significantly rises the risk of over-moderation, censorship, and discrimination. Striking a balance between the damage to be prevented and the rights or freedoms to be affected by the measures will be more delicate and instable.

Besides, implementing a preventive content moderation model could force too much and too far the voluntary measures encouraged by Article 7 DSA and turn into a *de facto* general monitoring obligation (Art. 8 DSA).

Yet, given the verbal, behavioral, sensorial character of content to be moderated in the metaverse, providers may need to implement other kinds of measures to ensure effectiveness. Limiting accessibility, visibility or accessibility may entail the adoption in virtual worlds of innovative measures such as restraining orders, limitation of movements for infringing avatars, closure of virtual premises, seizure of digital objects, or even, as in the most dystopian imaginaries, rendering the avatar “invisible” for others (as a sanction modern version of “ostracism”) or “digitally incapacitating” him/her for virtual life.

Such kinds of measures might intensify, due to the characteristics of the metaverse experience, the impact on fundamental rights and freedoms of users by encroaching upon their right to honor, reputation, private life, non-discrimination, free speech or social rights.

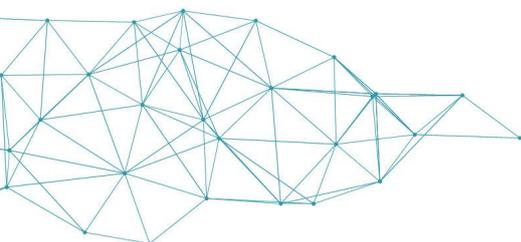
The need to prompt reaction against highly invasive actions or irreversible damages does also justify the deployment of self-protection measures for users. Besides the well-known user-blocking function in videogames, other fit-for-purpose and context-specific measures are developed for the metaverse. Meta has introduced the ‘personal boundary’ to prevent avatars from coming too close and to give control to user in limiting unwanted interactions²¹⁸.

On top of the above-described challenges, content moderation in the metaverse will also have to face the intricacies of the applicable legislation in virtual worlds.

As discussed above, the governance model of the metaverse/s is still undecided. Should a trend towards a model of centralized (or decentralized) platforms (IVWP and/or virtual worlds) as self-regulated environments be confirmed, the “Law of Metaverse (or of each virtual world)”²¹⁹ – users are to abide by on the basis of the membership agreement –

²¹⁸ Vivek Sharma, ‘Introducing a Personal Boundary for Horizon Worlds and Venues’ (*Meta*, 2 February 2022) <<https://about.fb.com/news/2022/02/personal-boundary-horizon/>> accessed 12 November 2024.

²¹⁹ Teresa Rodríguez de las Heras Ballell, ‘Rules for a Platform Economy: A Case for Harmonization to Counter “Platform Shopping” in the Digital Economy’ in Ilaria Pretelli (ed), *Conflict of Laws in the Maze of Digital Platforms – Le droit international privé dans le labyrinthe des plateformes digitales – Actes de la 30e Journée de droit international privé du 28 juin 2018 à Lausanne* (Schulthess, Zurich 2018) 55-79. In the aforementioned work (p. 62) the author coined the term “platform shopping”, a new variant of regulatory arbitrage, “to describe the intentional search for those platforms that offer a more favorable climate or friendlier regulation for a specific activity”. In a non-harmonized regulatory environment, platforms compete with each other as private ordering systems to attract users to join their community and operate in their “private jurisdiction”. Thus, in the absence



will be the first legal anchor in the assessment as well as the appeal for users to join those virtual worlds that are perceived as friendlier, safer, or with which users feel closer or more attached (even ideologically if virtual worlds' policies and rules materialize clear stances on relevant social debates). From this perspective, immersiveness would reinforce the idea of belonging to a community and, therefore, the compliance of the self-regulation set of rules may be naturally intensified.

Nonetheless, as explained earlier, the EU has articulated connecting solutions to bridge platforms' operation managed by non-EU established providers with European Digital Acts. These solutions would essentially work if actions in virtual worlds and their effects "overflow" the virtual borders and have an impact on the physical world. If so, the applicability of the EU *acquis* gains particular reasonableness as well as predictability (e. g. the place where the damage occurred²²⁰ or the place where the center of interests of the victim is located²²¹). In the absence of such "overflowing" impact, it may be argued whether a non-jurisdiction self-regulation solution is justifiable and, in practice, advisable. As a matter of fact, whether effects are limited to the metaverse and no impact or effect materializes in an out-metaverse scenario, it may be argued that there is no conflict of laws, no justified application of existing rules, or simply no need to overcome self-regulation.

As the evolution of the metaverse governance may also head towards the proliferation of State-created virtual worlds, the territorial borders would be then transferred to the virtual worlds. Thus, such metaverses would be governed by the law of the founding State.

4.3. Interoperability and openness of virtual worlds: the solutions of the DMA

As explained in Section 2, the Commission aspires to achieve a Web 4.0 "that is powered by open and highly distributed technologies and standards that enable interoperability between platforms and networks and freedom of choice for users"²²². However, despite the relative success of certain decentralized platforms such as Decentraland or The Sandbox, there is a risk that tech giants (e. g. Meta or Apple) will try to expand their dominant positions in Web 2.0 based on centralized platforms to the metaverse²²³. In parallel, new

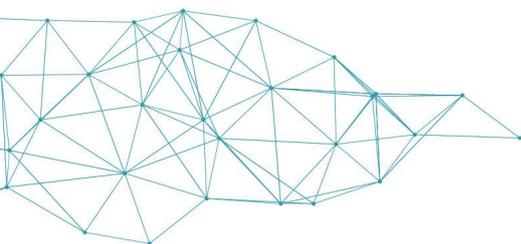
of harmonized platform rules, regulatory competition would allow digital market players to deploy strategic actions and search for the most suitable platform. While these efforts could be a natural response by private actors to healthy competition between platforms, platform shopping rather describes the risks of the lack of a harmonized legal framework, setting out the duties, obligations and responsibilities of platform operators, leading to the proliferation of illegal content, hate speech, fake news, illicit activities within platforms subject to less stringent applicable laws and exploiting the non-harmonized legal background.

²²⁰ It is relevant in this regard, the case law of the CJUE on jurisdiction to hear actions related to torts committed in the Internet in art. 7 (2) Regulation (EU) 1215/2012: Case C-618/15 *Concurrence* [2016] EU:C:2016:984; Case C-228/11 *Melzer* [2013] EU:C:2013:305; Case C-170/12 *Pinckney* [2013] EU:C:2013:635; Case C-387/12 *Hi Hotel* [2014] EU:C:2014:2124.

²²¹ It is relevant in this regard, the case law of the CJUE on jurisdiction to hear actions related to infringements of personality rights committed in the Internet in art. 7 (2) Regulation (EU) 1215/2012: Case C-509/09 *eDate Advertising* [2011] EU:C:2011:685; Case C-161/10 *Martinez* [2011] EU:C:2011:764; Case C-194/16 *Bolagsupplysningen* [2017] EU:C:2017:771.

²²² European Commission (n 43), p. 5.

²²³ Take Apple and Google as an example. They have a dominant position in app stores of mobile devices thanks to Google Play (in the case of Android devices) or the AppStore (in the case of iOS devices). This means that, in practice, apps cannot be directly downloaded from the Internet, but through the app stores. As a consequence, access to metaverse-related apps with mobile devices is thus, dependent on them. This gives the two big techs a privilege position to control access to the Metaverse and to impose their standards.



platforms of virtual worlds are emerging based on closed formats and controlled economies (e. g. Roblox or Fortnite).

There is thus a risk of having a small number of big players becoming gatekeepers of virtual worlds. Such a closed ecosystem with the prevalence of proprietary systems may translate to the metaverse the problems digital platforms have caused to businesses (in particular start-ups and SMEs), consumers, and society in the digital economy. In order to avoid this outcome, virtual worlds should be designed as open as interoperable from the outset²²⁴.

Openness and interoperability require the adoption of measures coming both from the main players of the metaverse (e. g. standards) and regulators. The DMA is one of the instruments that can foster both requisites. It is thus relevant to briefly analyze the impact that its provisions may have on the development of the new medium. Besides, and in addition to the *ex-ante* tools provided for by the DMA, Competition Law shall play a key role in addressing eventual anticompetitive and abusive practices in and in relation to IVWP or metaverse infrastructure providers²²⁵.

For the DMA to be applicable to an undertaking, it must be designated as a gatekeeper. This requires the undertaking to provide a “core platform service” as defined in art. 2 (2), and to meet the thresholds in art. 3²²⁶.

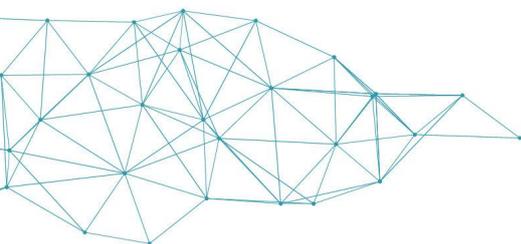
At present, six companies (all of them established in third countries) have been designated as gatekeepers in relation to some of their services. While these services are not specifically related to the metaverse, they may have an impact on its development. For instance, the dominant position that Google or Apple have in relation to their operating systems, their web browsers or software application markets may affect the possibility of other businesses to offer applications to end users to connect, to interact or to pay in virtual worlds. Therefore, compliance of the DMA provisions by these services should have positive effects in the openness and interoperability of the metaverse.

None of the existing metaverse infrastructure providers and IVWP meet the threshold in art. 3 to be designated as gatekeepers. The choice of a granular listing of “core platform services” in the DMA instead of a broad, comprehensive and functional definition

²²⁴ European Commission (n 43), p. 13.

²²⁵ A reference to the consultation opened by the European Commission in January has already been made [Kowalski, Volpin, and Zombori (n 122)]. At the other side of the Atlantic, it is worth recalling that the Federal Trade Commission sought to block virtual reality giant Meta and its controlling shareholder from acquiring Within Unlimited and its popular virtual reality dedicated fitness app, Supernatural. FTC argues that Meta is already a key player at each level of the virtual reality sector including the top-selling device, a leading app store, seven of the most successful developers, and one of the best-selling apps of all time. The agency alleges that Meta and Zuckerberg are planning to expand Meta’s virtual reality empire with this attempt to illegally acquire a dedicated fitness app that proves the value of virtual reality to users. “*Instead of competing on the merits, Meta is trying to buy its way to the top,*” said FTC Bureau of Competition Deputy Director John Newman. “*Meta already owns a best-selling virtual reality fitness app, and it had the capabilities to compete even more closely with Within’s popular Supernatural app. But Meta chose to buy market position instead of earning it on the merits. This is an illegal acquisition, and we will pursue all appropriate relief*” [Federal Trade Commission, ‘FTC Seeks to Block Virtual Reality Giant Meta’s Acquisition of Popular App Creator Within’ (Federal Trade Commission, 2022) <<https://www.ftc.gov/news-events/news/press-releases/2022/07/ftc-seeks-block-virtual-reality-giant-metas-acquisition-popular-app-creator-within>> accessed 12 November 2024].

²²⁶ Art. 3(1) DMA: “(a) it has a significant impact on the internal market; (b) it provides a core platform service which is an important gateway for business users to reach end users; and (c) it enjoys an entrenched and durable position, in its operations, or it is foreseeable that it will enjoy such a position in the near future. These requirements are further developed in the following paragraphs of the provision”.



of such services²²⁷, complicates the assessment about whether certain metaverse-related services can qualify as such and, thus, be designated as gatekeepers in the future.

On the socializing angle, virtual worlds can be seen as “online social networking services” that the DMA defines as “a platform that enables end users to connect and communicate with each other, share content and discover other users and content across multiple devices”. This is the case of VRChat, Horizon Worlds, or Roblox.

On the most commercial angle, virtual worlds are transactional environments, markets, enabling the offering of digital assets and facilitating transactions as “online intermediation service providers” are described with the referral to the P2B Regulation. This is the case of Decentraland, where users can transact with virtual properties; or Roblox, where users can transact with digital goods. In both cases, the platforms have their own digital currency: Mana and Robux.

Less convincing may be the proposal that IVWP are (solely) “video-sharing platforms”²²⁸ insofar as the definitions of programme²²⁹ and user-generated video²³⁰ appear to be far from grasping the sophistication, the experiential component, the interactive and immersive goal, and the visuality of the building blocks of virtual worlds. Neither be convincing the possible categorization as “online content-sharing service providers” pursuant to the Directive 2019/790. As per the definition of Article 2(6) Directive 2019/790, these are information society service providers whose main purpose, or one of their main purposes is to store and give the public access to a large amount of copyright-protected works or other protected subject matters uploaded by users, that the providers organize and promote for purpose-making purposes. Certainly, the main purpose of online content-sharing service provider can embrace various functions performed by IVWP. Virtual worlds generated by users and deployed within the IVWP can be copyright-protected worlds. But restricting the role of IVWP to “store and give access” seems reductionistic and barely grasping the extent and the sophistication of IVWP.

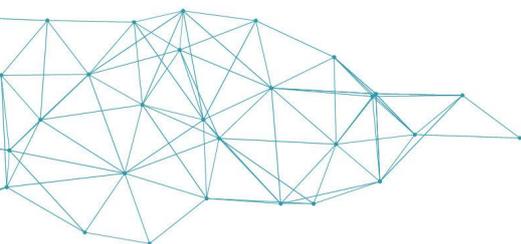
Needless to say, the applicability of the DMA can be more evident and straightforward to actors of the metaverse other than the IVWP, to whom our attention is primarily focused. Thus, “operating systems”, or “virtual assistants” are eligible candidates. In relation to the first category, it should be recalled that each provider of VR headsets uses its own operating systems (e. g. Meta Horizon OS, Pico]OS, or VisionOS). In relation to virtual assistants, these artifacts can be embedded in assistant avatars that interact with

²²⁷ As defended by part of the doctrine, “the list-based definition of core platform services is not optimal for guaranteeing a technology-neutral, structure-agnostic adaptability of the DMA to future challenges. A list of selected services may instill rigidity in the proposal in the face of new emerging models. Simultaneously, the current list of selected services does not succeed in ensuring terminological consistency and conceptual coherence with other Union acts. The risk of overlaps, gaps, or conflicts among applicable rules should be prevented and minimized. Therefore, I propose an alternative option for definitions, based on a functional description of core platform services” [Teresa Rodríguez de las Heras Ballell, ‘The Scope of the DMA: Pivotal for Success, Critically Assessed’ (2021) 21-25 Max Planck Institute for Innovation & Competition Research Papers, pp. 72-73].

²²⁸ Directive 2018/1808 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive)[2018] OJ L 303/69.

²²⁹ Article 1(1) Directive 2018/1808: “programme’ means a set of moving images with or without sound constituting an individual item, irrespective of its length, within a schedule or a catalogue established by a media service provider, including feature-length films, video clips, sports events, situation comedies, documentaries, children’s programmes and original drama”.

²³⁰ Article 1(1), Directive 2018/1808: “user-generated video’ means a set of moving images with or without sound constituting an individual item, irrespective of its length, that is created by a user and uploaded to a video-sharing platform by that user or any other user”.



participants in virtual worlds or operate as interfaces in the interaction between prospective or current users and the IVWP.

Looking at the future, once some of the main players of the metaverse reach the thresholds in art. 3 to be designated as gatekeepers, they shall comply with certain DMA provisions aimed at fostering openness of virtual worlds. Particular attention should be paid to paragraphs 4, 6 and 12 of art. 6.

The first one obliges providers of operating systems (at present iOS, Android or Windows; in the future, Meta Horizon OS, Pico OS, or VisionOS if they reach the threshold in art. 3) to enable the installation and effective use of third-party software applications or software application stores. So, hypothetically, Apple should allow Decentraland to develop an app compatible with the VisionOS and that can be downloaded by users of the Apple VisionPro headsets. The provider of the operating system can only adopt restrictions to ensure the integrity of the hardware or operating system provided by the gatekeeper, provided that such measures are duly justified by the gatekeeper.

The second prohibits providers of any core platform service to restrict the ability of users to switch between different software applications and services. Hypothetically, a user of Meta Quest should be able to switch from Horizon Worlds to Decentraland.

The third obliges gatekeepers to apply fair, reasonable, and non-discriminatory general conditions of access for business users to its software application stores, online search engines and online social networking services. Coming back to a previous example, Decentraland should be allowed to offer its app in Apple app store for the Vision Pro headsets under FRAND conditions.

The DMA includes two provisions specifically dealing with interoperability. The first is art. 7, but it is not applicable to providers of metaverse-related services²³¹. More relevant is the obligation in art. 6(7).

According to this provision, providers of operating systems and virtual assistants designated as gatekeepers shall provide third parties, free of charge, with the necessary information to ensure interoperability with their hardware or services²³². The gatekeeper can only ban access to this information or impose obligations as far as this is strictly necessary and proportionate to ensure that interoperability does not compromise the integrity of the operating system, virtual assistant, hardware or software features provided by the gatekeeper.

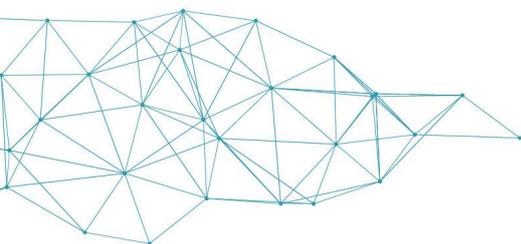
Following this provision, if designated as gatekeepers due to the operating systems of their devices, Meta and Apple will be forced to provide the necessary information so that IVWP and developers of VR experiences can develop apps compatible with these operating systems and available in their software application markets.

As per Article 6(9) DMA 'the gatekeeper shall provide end users and third parties authorized by an end user, at their request and free of charge, with effective portability of data provided by the end user or generated through the activity of the end user in the context of the use of the relevant core platform service, including by providing, free of charge, tools to facilitate the effective exercise of such data portability, and including by the provision of continuous and real-time access to such data'. On the other hand, Article 20 GDPR regulates the right to (personal) data portability by the data subject.

Portability in the Metaverse has a singular dimension. Users and professional users may wish to port their avatars and/or their "community of users' data from one virtual world to another. Is that sophisticated 'embodied' portability addressed by existing

²³¹ It exclusively affects "number-independent interpersonal communication services".

²³² This requires a designation decision pursuant to art. 3(9) DMA.



provisions? Data generated in metaverse experiences are incredibly diverse, numerous, and heterogenous, may be static or dynamic, persistent or ephemeral, behavioral, transactional, sensorial, social or conversational. The current understanding of portability may fail to embrace such a complex process of 'migration' of virtual 'personas' among virtual world.

Will the non-personal data portability provisions in the Data Act apply as well?²³³ Could the contract-based scheme underpinning the Data Act be to a certain extent relevant in metaverse-related devices? As explained in the introduction, we are not diving into the Data Act considerations as they are not emerging necessarily from the metaverse experience but from the devices employed to access the virtual worlds. Therefore, the issues are not essentially singular and metaverse-specific.

5. AI and automation in the metaverse: the AI Act

AI systems have the potential to penetrate all corners of the metaverse from fully AI-driven avatars, to supervision, surveillance, scoring, recommendation, planning, advertising, or algorithmic management.

The main actors of the metaverse – IVWP and active users (developers) – can be “providers” (importers or distributors)²³⁴, or “deployers”²³⁵ falling under the personal scope of the AI Act, provided that the territorial connecting factors are met.

The AI Act has an ambitious territorial scope of application anchored not only by active actions of putting into service or placing on the market, but also, independently of the place of establishment or location, where either Member State law applies by virtue of public international law, or the output produced by the system is intended to be used in the Union²³⁶.

Again, we face the challenge of linking the effects of metaverse experiences or practices with territorial connecting points for the purposes of applying EU Digital Acts. The outputs of an AI system implemented in the metaverse for e. g. screening and evaluating eligible candidates for a job in, a solely in, the metaverse, do they have any effect in a State jurisdiction (in the Union) outside the metaverse?²³⁷

The life-like aspiration of metaverse experiences tends to presume that many uses and applications of AI systems will be classified as high-risk systems or even be prohibited by the AI Act as they can easily cover areas of social and economic interaction that the AI Act have designated as high risks AI systems in Annex III or prohibited practices in art. 5.

It is easy to imagine the use of AI systems to recreate avatars that turn to be deep fakes which interact with users with the purpose of distort their ability to make an informed decision; or the use of AI systems by IVWP to evaluate the behavior of users in their virtual

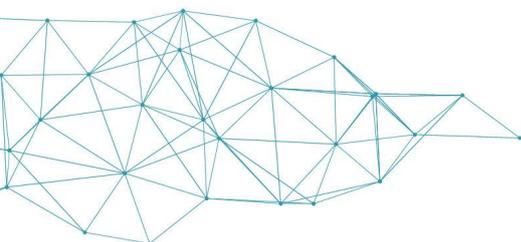
²³³ Arts. 23-31 DMA regulate the obligation of data processing services to allow their users to switch to other providers.

²³⁴ Art. 3(3) AI Act: “provider’ means a natural or legal person, public authority, agency or other body that develops an AI system or a general-purpose AI model or that has an AI system or a general-purpose AI model developed and places it on the market or puts the AI system into service under its own name or trademark, whether for payment or free of charge”.

²³⁵ Art. 3(4) AI Act: “deployer’ means a natural or legal person, public authority, agency or other body using an AI system under its authority except where the AI system is used in the course of a personal non-professional activity”.

²³⁶ Art. 2(1) AI Act.

²³⁷ Some of the connecting factors adopted to determine the applicability of the AI Act are highly problematic. In this regard: López-Tarruella Martínez (n 203), p. 31.



worlds in order to classify them in other contexts (*social scoring*). As far as they meet the requirements in arts. 5(1)(a) and (c) these are prohibited AI practices.

Similarly, other AI systems that might be used by IVWP can qualify as high-risk, thus they would need to meet the requirements and obligations in arts. 8 and ff. This would be the case of AI-powered avatars whose behavior is based on recognition of emotions of users of a virtual worlds (point 1(c) Annex III) in areas other than education institutions and workplace. IVWP using these kind of AI systems are obliged to inform their users of the operation of the system and shall process the personal data in accordance with the GDPR²³⁸.

AI systems used in metaverse-like experiences for education and vocational purposes may also qualify as high risk if they meet the requirements in point 3 Annex III. Similarly, the use of AI systems in virtual worlds for law enforcement purposes would also be considered high-risk as far as the requirements of point 6 Annex III are met.

But are these uses high-risk applications in the metaverse if they do not have any impact on 'real' rights and interests? Should an avatar and/or a user represented by his/her avatar be protected from discrimination in the metaverse even if that does not have any effect in the physical world? Is there a right to be admitted in certain 'public services' in the metaverse even if solely provided by a private IVWP? Wouldn't it be a reasonable expectation for metaverse users that everything around them is indeed 'fake'? Are users really misled? Indeed, are the protection goals of the AI Act – safety, security and human rights – intimately linked to the physical world or are they pervading the metaverse as well?

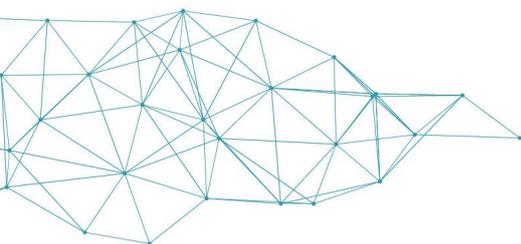
If the answer to the above-listed questions is in affirmative and, therefore, the rationale behind the AI Act is equally reasonable and legit in the metaverse, then a more granular analysis of the adequacy of certain requirements and obligations.

An example of a provision that deserves a deeper study is art. 50. This provision establishes transparency obligations to any certain AI systems, regardless of their classification or not as a high-risk. For instance, in accordance with paragraph 1, AI-powered avatars intended to interact directly with a natural person's avatar should be designed in such a way that the natural person is informed that she is interacting with an IA system. How can this result be ensured: should the AI-driven avatar introduce itself every time as a non-human avatar? According to the provision, this would not be necessary if "this is obvious from the point of view of a natural person who is reasonably well-informed, observant and circumspect, taking into account the circumstances and the context of use". Would it be enough to provide AI-powered avatar a different appearance? Should certain types of avatars be compulsory used as non-human avatars to enable recognition?

According to paragraph 2, content automatically generated by AI systems (synthetic audio, video or text) should be marked in a machine-readable format and detectable as artificially generated or manipulated. Additionally, the provision states that "providers shall ensure their technical solutions are effective, interoperable, robust and reliable as far as this is technically feasible". Is not everything in the metaverse synthetic and artificially generated *per se*? Probably not, as it can be created by humans and by human avatars. But is equally impactful artificially-generated content in the metaverse where the perception is that everything around is "virtual or non-real"?

Finally, IVWP manipulating image, audio or video content constituting a deep fake that is used in their virtual worlds (e. g. someone acting as a representative of a company)

²³⁸ Art. 50(3) AI Act.



are obliged to inform that the content has been artificially generated or manipulated²³⁹. This information “shall be provided to the natural persons concerned in a clear and distinguishable manner at the latest at the time of the first interaction or exposure”.

Some of these obligations may significantly impact how virtual worlds are configured, are created and develop. We wondered how the disclosure and information duties provided in this provision will be effectively articulated in the Metaverse and whether it will be so decisive to protect users’ rights and other interests considering the nature itself of virtual worlds and users’ expectations.

6. Conclusions

This Paper aims to explore whether and to which extent the current legal and regulatory framework adopted in the European Union to address the new challenges of a well-developed, still in expansion, and increasingly sophisticated digital economy apply and, if so, are suited to metaverse-related activities, markets, and actors. The analysis is focused on the scope of application and the issues addressed by the three European Digital Acts under study: the DSA (together with the P2B Regulation), the DMA, and the AI Act.

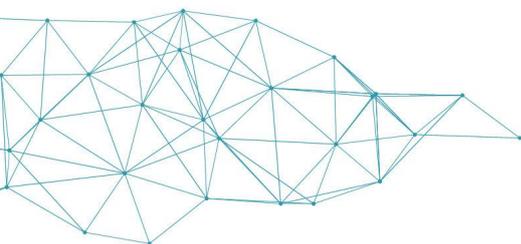
The metaverse is a world “under construction”. That is crucial and decisive, on the one hand, in assimilating or formulating a definition of metaverse, and, on the other hand, in assessing the extent to which the European Digital Acts does not only apply but succeed in ensuring a responsible development of metaverse models. First, a definition of metaverse or metaverse-related situations is a prerequisite to deploy the legal analysis. As it is still an evolving and unfinished phenomenon, the proposed or selected definition is instrumental to provide a realistic and accurate description and understanding of the problems and the challenges. There are several definitions with diverse scope, and with varying degrees of generality. Some definitions are based on technical specifications, while others are rather based on its main features, either of organization, functional, or operational character. Second, as the metaverse is in evolution, the potential applicability of the European Digital Acts does not entail necessarily that its development will accommodate to their policy goals and primary legal requirements. Indeed, the market reaction might be otherwise, departing from the model or models enshrined in the Digital Acts if no adequate incentives are provided. Such a strategical discussion is necessary and cannot be ignored.

Among the possible definitions, the Paper identifies two main ones: a narrow definition (purely describing virtual worlds or metaverses) and a broad definition (Web 4.0). The Paper aligns with the narrow definition as it is underpinned by main features instead of describing technologies involved or being dependent upon specific governance or organization models.

On the basis of the narrow definition (proposed by M. Ball), four key attributes are identified to genuinely define metaverse and explained accordingly: immersiveness, interoperability, synchronicity and persistence. These attributes are functional enough so as to embrace different governance models, to assimilate new technological solutions under a technology-neutral or technology-agnostic vision, and to single out the emerging legal challenges that these distinctive features pose.

In order to test the applicability of the European Digital Acts to the Metaverse, the primary players in metaverse-related activities, markets and experiences must be

²³⁹ Art. 50(4) AI Act.

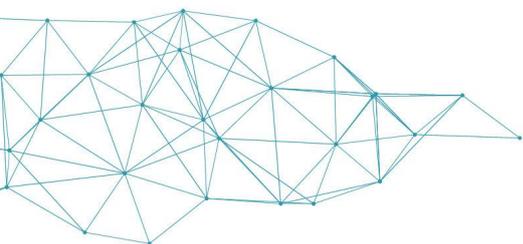


identified. So, it can be then discussed whether they potentially fall under the personal scope of application of such pieces of legislation. The primary players in the metaverse are classified in four groups: infrastructure providers, virtual world platforms (IVWP), content and virtual worlds developers (CVWD), and users. Although the organizational model of the Metaverse is not clearly established yet, and centralized and decentralized models coexist, the leading role of IVWP builds a rather robust bridge to the DSA (and along similar lines, the DMA) that is precisely designed for the platform economy.

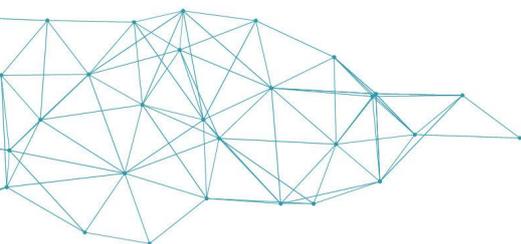
Thus, it is concluded that the DSA (and the DMA) can, to that extent, be naturally extended over one of the main actors in the construction of the metaverse: the IVWP. Functionally, these platforms are created, operated, and managed as “online platforms”. The IVWP enacts the rules for creating, accessing or interacting in the hosted virtual worlds, provides services and render tools available for creators and developers, supervises and moderates users’ activity and content as per the applicable policies. As any other platform, IVWP are based on the idea of contract-based private ordering. In fact, the communities of users (professional and non-professional users) and developers (CVWD) join the virtual worlds by concluding a contract with the IVWP. Conceptually, IVWP fits into the legal definition of online platforms and, in some cases, specifically, online intermediation service providers. Relevant consequences in affirming the applicability of the DSA and the DMA would follow.

The application of the DSA, that is closely discussed with the (rather limited) application of the preceding P2B Regulation, have multiple implications for IVWPs. Among them, special attention is paid in the Paper, given its centrality in the DSA, to the adequacy of the provisions on content moderation in virtual worlds. Section 4.2 provides for some obligations related to content moderation applicable to online platforms, as hosting service providers. These mechanisms play a central role in obtaining actual knowledge or awareness for the purposes of the intermediary liability exemption (in particular, Art. 6 DSA). It is concluded that IVWP, as online platforms, are subject, as per the DSA, to the content moderation due diligence obligations laid down in Articles 16 to 18: notice and action mechanisms, statement of reasons, and notification of suspicions of criminal offences. Even more, it is affirmed that content moderation plays a critical, and significantly more fundamental, role for the responsible development of the Metaverse: increased exposure of users to risks, aggravated vulnerabilities, pernicious effects of illegal content or misinformation, or higher interference on users’ decision-making. Despite its criticality, the metaverse poses special and additional challenges that may question or at least heavily stress out content moderation mechanisms, procedures, and rules as they are conceived and are working in the platform economy. Given the verbal, behavioral, sensorial character of content to be moderated in the metaverse, providers may need to implement other kinds of measures to ensure effectiveness. Such kinds of measures might intensify the impact on fundamental rights and encroach upon users’ right to honor, reputation, private life, non-discrimination, free speech or social rights. Besides, along with other complexities, content moderation in virtual worlds need to cope with the difficulties in determining the applicable law and in settling and solving disputes.

While the application of the DMA and the DSA seems straightforward and frontal in the metaverse, without ignoring the identified complexities and inadequacies, the AI Act appears more incidental and less central. However, there are several relevant provisions that may apply to metaverse-related experiences. As the metaverse evolves as a “virtual world”, multiple areas covered by Annex III as high-risk uses and even some prohibited practices as per art. 5 AI Act can be naturally deployed in the metaverse. Hence, the AI Act would govern the development of numerous activities in the Metaverse. The generation of



artificial content (*deep fakes*) could be even less perceptible and become more silent and pervasive in metaverse experiences. Yet, non-human AI-drive avatars (NCP-like avatars) would activate the transparency and disclosure obligations provided for art. 50 AI Act, even if its implementation in virtual worlds may require some further considerations.



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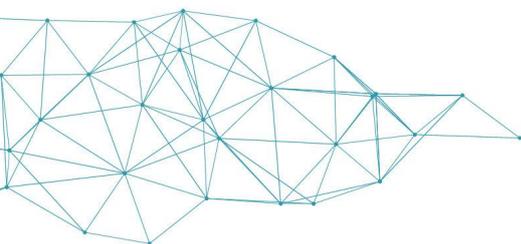
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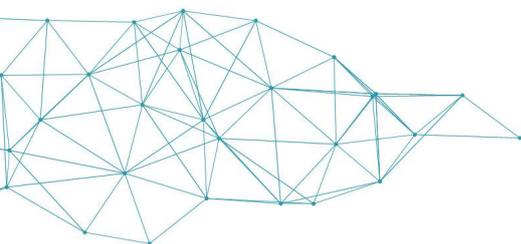
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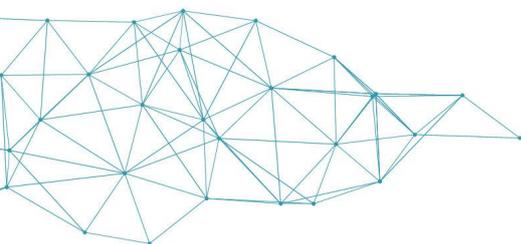
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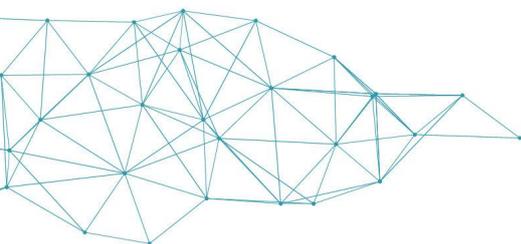
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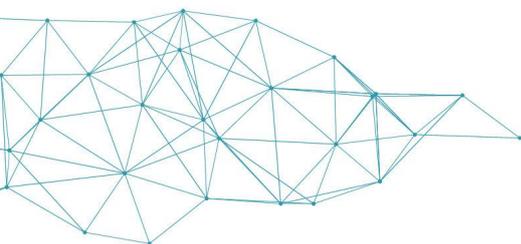
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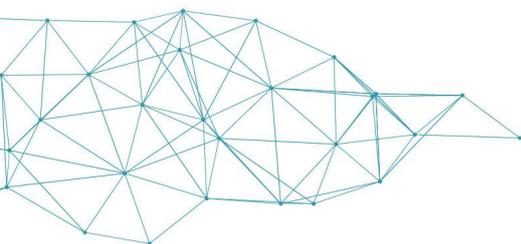
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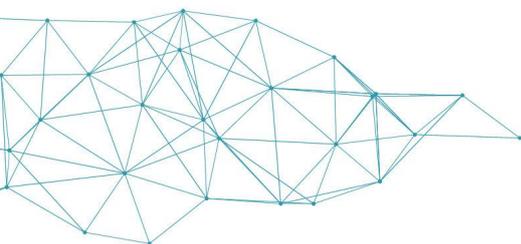
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