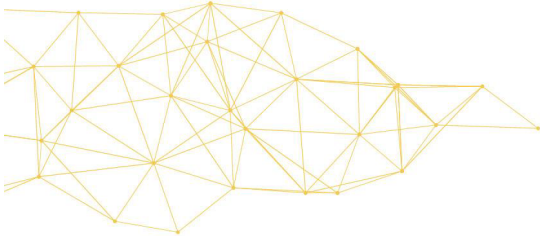


## Protecting young players in the Metaverse

Proceedings of the International Congress Towards a Responsible  
Development of the Metaverse, 13-14 June 2024, Alicante

**Adèle Serio**

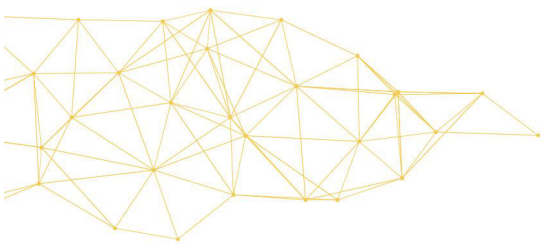
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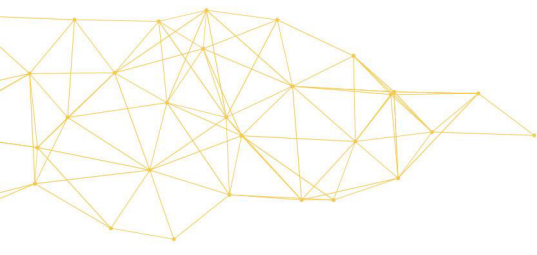
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## Abstract

Protecting young players in the Metaverse is one of the challenges, if not the most important, for the development of a sane and safe Internet with the emergence of new information and communication technologies. VR/AR headsets, sensors for motion recognition and geolocation, crypto-currencies and online gaming are already evidence of a highly demanding environment for personal data, and an overexposed new generation. The first aim of my article is to explain the close link between the evolution of video games and the creation of the Metaverse. Both share a similar audience, young, in search of stimulation and entertainment, whose issues of cybersecurity, privacy and transparency are more topical than ever. The second aim is to warn on an overly speculative environment, gangrened by microtransactions and crypto/*in-game* currencies, and rethinking regulations for the various players involved in the creation of this virtual world.

**Keywords:** Metaverse, Virtual Reality (VR), crypto-currencies, online gaming



## Table of contents

<b>1. Introduction .....</b>	<b>1</b>
<b>2. Protect youth from the speculative environment of the Metaverse .....</b>	<b>3</b>
2.1. The roots of a consumption model on the edge of gambling .....	3
2.2. The Play-to-Earn era .....	6
<b>3. Progressive awareness and regulations for kids' safety within the Metaverse .....</b>	<b>8</b>
3.1. A system based on personal data massive processing and violence risk .....	8
3.2. Regulations concerning minors and parental responsibility .....	10
<b>4. Conclusion .....</b>	<b>13</b>
<b>Bibliography .....</b>	<b>14</b>



## 1. Introduction

"Nothing is true, everything is permitted"<sup>1</sup> pronounces the main character of *Assassin's Creed*, Ezio Auditore, in the second opus of the famous franchise. These few words reflect the true credo of the assassins' plot: to remain vigilant on the fragile foundations by remaining the architect of our choices and assuming the consequences.

Nearly 15 years later, this quote is a reminder of the new direction the audiovisual world intends to pursue: change the foundations established by the crumbling of purely physical borders, redefine the status of simple viewer, and enter a new virtual *Eldorado*... at our own risk.

At the heart of these upheavals lies the encounter between video game publishers and the ambitions of the major social networks in the dematerialized infrastructure of the Web 3. Indeed, the Metaverse is referred to a virtual and augmented reality, in which users can interact with a computer-generated environment and other users. It is generally characterized as an extension of the Internet, the « New Internet », which abolishes all borders between the real and the virtual.<sup>2</sup> The Metaverse could require the use of virtual reality glasses or other sensory combinations, as is the case to benefit from Meta services, while it is intended to be free and accessible not only to video game players, but also to the average citizen who wishes to use this new space as a meeting and work place, an extension of his or her daily life.

The Metaverse embodies this continuity, but video games are its cradle, in their ability to stimulate creativity, synergy and communication between players. The publisher knows well the power of such structure and declines it in various video game categories, in every respect similar to the characteristics of the Metaverse.

First of all, the *Sandbox Games*, meaning "a video game or part of a video game in which the player is not constrained to achieving specific goals and has a large degree of freedom to explore, interact with, or modify the game environment".<sup>3</sup> One of the most iconic Sandbox games could be embodied in *Minecraft*<sup>4</sup>, the five-star licence of Mojang in 2011, where the player builds whatever they could imagine with 3D cubes and pixels in an unlimited environment. Each server created by a single player in *Minecraft* can welcome other collaborators, in which they assign themselves a role or specific settlements. The worlds traveled by the player are randomly generated by computer, offering them infinite possibilities of creation and amazement, not to mention, mini- games or survival modes to try. The recent add of *Oculus Rift headset*, turned it into a VR- compatible game and consistently increased the Metaverse sensation.<sup>5</sup> The Metaverse is similar to Sandbox games in that its scaling criterion enables the size of the Metaverse to be increased as an open world.

Secondly, *MMORPG Games* were, without any doubt, a pioneer by integrating numerous aspects of the Metaverse. *World of Warcraft*<sup>6</sup>, released in 2004, is one of the most popular Massive Multiplayer Online Role-Playing Games in which gamers play together online to succeed quests and collect items (weapons or armors) in a medieval fantasy

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<sup>1</sup> *Assassin's Creed: Revelations* – A Homecoming (2011), developed by Ubisoft Montréal and published by Ubisoft

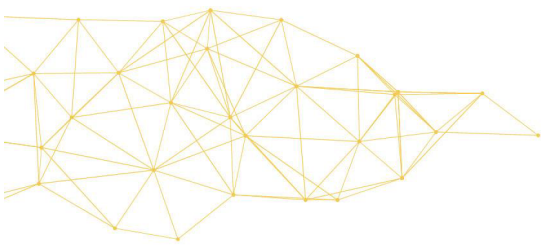
<sup>2</sup> P Sirinelli and S Prévost, *Ready Lawyer One!* (Daloz IP/IT, Daloz, 2020).

<sup>3</sup> Sandbox's definition in Merriam-Webster website: <https://www.merriam-webster.com/dictionary/sandbox>

<sup>4</sup> *Minecraft* is a sandbox game, released in 2009 by the studio behind its development, *Mojang*, it was acquired in 2014 by Microsoft.

<sup>5</sup> L .Ambalina, *Understanding the Minecraft Metaverse* (Hackernoon, September 27, 2022)

<sup>6</sup> *World of Warcraft (WoW)* is a massively multiplayer online role-playing game (MMORPG) developed by the American studio Blizzard Entertainment.



Universe, constantly evolving and accessible 24/7, everyday of the year. Each player creates an “avatar”<sup>7</sup>, a character, in order to represent him in the virtual world. The latter could be subject to change (improve his capacity, changing his role within the society) on the basis of his progression and exploration in the game.<sup>8</sup> Players are stimulated by their close collaboration with the entire community, and are encouraged to create their own guild. However, World of Warcraft was, at the time, more driven by gaming primarily than a social network conception. In short, the Metaverse enables the evolution of current online avatar identities to establish a stronger link with the user.

Finally, *The Battle Royale*, is a new video game mode initially introduced by PlayerUnknown's Battlegrounds (PUBG), released in 2016, and massively popularized by Fortnite one year after. The main idea is to oppose players in the middle of a giant online battlefield, until only one survives. Epic Games, the publisher of Fortnite, perfectly embodies the concept of the Metaverse and distinguished itself through several decision-making. Indeed, Epic develops real-time 3D creation tools, “Unreal Engine”, invest in huge esports competition, “Fortnite World Cup”, introduce the “free-to-play (F2P)” business model and host several non-gaming events in the Battle Royale, such as the concert of Travis Scott watched at the same time by 12.3 million viewers<sup>9</sup>.

Epic Games has laid the foundations for a parallel virtual world craze through its persistence capability, unlocking technical limitations to improve the immersions and calling on multiple contributors, content from all sorts of stakeholders from individuals to commercial organizations. This fresh interest in the Metaverse, not only as a game architecture, but also as a social network and above all as a marketplace, is crucial: it places the individual not only as a player, but first and foremost as a consumer. The confusion of worlds and the public's place are assumed through each player's investment in the game, but unlike other forms of entertainment, the target audience is mainly children.

In the early 2000s, with the arrival of the first mass-marketed video games, children's exposure to screens was already decried by a society not yet open to this new digital phenomenon. The presupposed violence represented in the “First Person Shooters” (FPS) type<sup>10</sup>, provoked indignation among numerous betting associations, especially in the United States<sup>11</sup>. Widespread distrust of video games, and public authorities' concern in this regard, has prompted the industry to comply with certain rules, in particular the introduction of an age limit by Pan European Game Information (“PEGI”), in April 2003. The same applies to the ban on the sale and censorship of certain video games<sup>12</sup> considered too brutal or violent or “cheat code” scandals. A relationship with authority, then, constantly redefined by the enthusiasm and freedom of gamers, who appropriate video games as a space for creation and catharsis in the face of everyday realities<sup>13</sup>. With the

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<sup>7</sup> B. Chester Cheong, *Avatars in the metaverse: potential legal issues and remedies* (3:2 International Cybersecurity Law Review 467-494, 2022)

<sup>8</sup> World of Warcraft proposes PvE (Player versus Environment) and PvP (Player versus Player) dynamics.

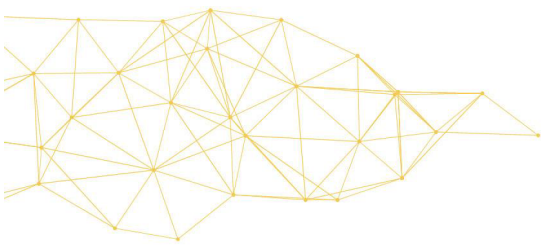
<sup>9</sup> *Fortnite and Travis Scott present: Astronomical*, <https://www.fortnite.com/news/astronomical>

<sup>10</sup> The *First Person Shooters* is a type of video game in which the player incarnates an armed character evolving in a benign environment and avoids his enemies.

<sup>11</sup> P. Markey and C. Ferguson “2”. *Moral Combat: Why the War on Violent Video Games Is Wrong*. (BenBella Books, Inc. 2017) referring in particular to the Columbine mass shootings in 1999, which raised questions about the link between violence and video games.

<sup>12</sup> A Timeline of Video Game Controversies, National Coalition Against Censorship, <https://ncac.org/resource/a-timeline-of-video-game-controversies>

<sup>13</sup> E.J. Lee, H.S. Kim and Choi S. *Violent Video Games and Aggression: Stimulation or Catharsis or Both?* (Cyberpsychol Behav Soc Netw. 2021 Jan;24(1):41-47)



democratization of video games and the more frequent use of new information and communication technologies, video gaming has diversified among new generations of gamers, as young as ever<sup>14</sup>. The Metaverse craze is therefore shared with Gen Z<sup>15</sup> and Gen Alpha<sup>16</sup> players, who are familiar with and sufficiently exposed to the game, but whose protection and moderation are subject to similar, if not greater, issues<sup>17</sup>.

In this regard, how could we explain the transformation from a playful space to a lucrative space with a young and uninformed audience? How can we promote better regulation and protection of the metaverse for young players? A first section will be dedicated to the analysis of the ecosystem in which the young player evolves and the speculative drifts of the Metaverse. The second section will concentrate on directing content towards an ethical and educational Metaverse.

## 2. Protect youth from the speculative environment of the Metaverse

### 2.1. The roots of a consumption model on the edge of gambling

While the video game industry was initially undervalued by investors, it is now capitalizing on several billion dollars in annual revenues. Forecasts are bright, with the global games market revenues of \$183.9 billion in 2023.<sup>18</sup> The profitability of video games has always been a central issue, as shown by the succession of different business models adopted over the years by game publishers.

The classic model is based on the *Business to Consumer* (“B2C”) model, in which the platform offers the game for sale under cover, subject to payment of the agreed price. In this situation, children could not claim payment on their own, and parental control was guaranteed. Meanwhile, marketplaces for dematerialized game sales, such as *Steam*, are selling games at knock-down prices, the ban on minors holding credit cards greatly reduces the likelihood that they will be able to shop freely on the Internet<sup>19</sup>.

However, the shift to mobile games on smartphones has completely changed the way games are enjoyed and the profile of players. It is now possible to play *arcade-style* games like *Candy Crush*, without the need for a complex narrative arc or sophisticated graphics to stimulate the player's attention and interest<sup>20</sup>. Given the player's adulthood and the financial possibilities of owning his own capital, they seem more inclined to spend money to progress rapidly in the game. From now on, the viability of gaming will no longer

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<sup>14</sup> According to Statista, in 2023, 94% of French people aged between 10 and 14 played video games, compared with 47% of those aged 65 and over, <https://fr.statista.com/statistiques/481002/proportion-gamers-francais-age-jeux-video/>

<sup>15</sup> Gen Z represents individuals born 1995-2009, from 13 to 27 years old.

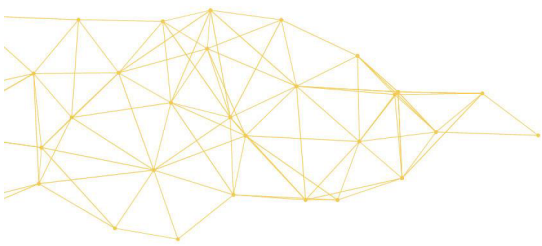
<sup>16</sup> Gen Alpha represents individuals born 2010 or later, from 10 to 12 years old.

<sup>17</sup> Newzoo Gamer Insights, *The Future of Gaming*, (February 2022 – April 2022)

<sup>18</sup> 2023 Global Games Market Report, Newzoo: “The overall growth of the 2023 games market toward 2026. After recovering in 2022, the global games market will generate revenues of \$183.9 billion, with year-on-year growth of +0.5%”, <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>

<sup>19</sup> Steam Support provides a “Family View” mode mentioning: “You can use Family View to limit an account's access to a subset of its content and features. With Family View, access to the Steam Store, Library, Community, Friends content and other features may be gated by the entry of a secret PIN”. <https://help.steampowered.com/en/faqs/view/6B1A-66BE-E911-3D98>

<sup>20</sup> A business model also called Freemium (*Free & Premium*), integrating traditional means of monetizing online content, mainly advertising and the use of personal data from PX. Chomiac, *L'encadrement juridique des nouveaux moyens de monétisation d'un jeu vidéo* (Village Justice, mai 2020)



be based on a high entry price and the need for expensive hardware (console, gaming PC, controller), but rather on the simple possession of a smartphone, no fees, and the ability to pay online for what are known as “microtransactions”<sup>21</sup>.

As defined by Saddique Ansari, a “microtransaction” is a small, optional, one-time payment made within a game or application to purchase virtual items within the game or application, such as upgrades, coins or cosmetic enhancements. Microtransactions are used to enhance players' gaming experience and offer them additional content to the basic game<sup>22</sup>. In the vast majority of microtransactions, fiat currency is exchanged for a virtual currency dedicated exclusively to the game. With rare exceptions, the latter cannot be exchanged or converted back into its original currency, nor can its value change once purchased. An important factor to take into account, for young players whose relationship with money, control and education is still in progress.

In line with this new perspective, the video game environment evolved towards the *free-to-play* formula. Referring to a totally free game, devoid of any entry fee (under condition of registration). They hope to generate revenue from advertising or in-game sales, such as payment for upgrades, “boost or Power-Ups”<sup>23</sup>, “cosmetics”<sup>24</sup> and “expansion packs”<sup>25</sup>.

A successful business model for young gamers, neither constrained by age nor financial liquidity, who can play *Fortnite* completely free of charge by simply signing up for an account on the Epic Games launcher<sup>26</sup>. However, evolving in the *Fortnite* universe means being surrounded and pushed in a cyclical and recurring way to buy micro-transactions, consuming them to benefit from a special skill, an original style or a dance step through “loot box”. It is a virtual container that can be purchased using real money in a video game and contains random rewards. Loot boxes are criticized for being gambling games due to their random nature. Critics of the loot box controversy argue that the uncertain and its random nature can create an experience similar to gambling<sup>27</sup>, especially when real money is involved. Loot boxes can finally encourage players to spend more money in search of powerful rewards in order to gain a competitive edge over other players and increased financial burden for players.<sup>28</sup>

In this respect, several class actions in North America have been brought against Epic Games' titles *Fortnite: Save The World* and *Rocket League*<sup>29</sup>. The class action was certified by the Supreme Court of British Columbia and the settlement also resolves claims in a separate, similar lawsuit in Quebec. The lawsuit originally alleged that Epic's placement of loot boxes in games like “Fortnite” and “Rocket League” constituted unlicensed gambling.

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<sup>21</sup> *Ibid.*

<sup>22</sup> S. Ansari, *The Economics of Microtransactions* (August 03, 2023), <https://www.economicsonline.co.uk/definitions/the-rise-of-microtransactions-in-video-games.html/>

<sup>23</sup> These boosts may include weapons, pets, horse armor, speedy points gain, more powers, enhanced abilities or faster progression.

<sup>24</sup> These cosmetics may include clothes and accessories.

<sup>25</sup> The expansion packs or downloadable content (DLC) expands the base game experience and are often sold as microtransactions. These packs may provide new storylines, areas to explore, missions, or game modes from S. Ansari (*Ibid.*).

<sup>26</sup> We shall see in a few pages that the retention of personal data is in itself a price of entry for processing and adding value to it.

<sup>27</sup> F. de Leeuw, *The Convergence of Gaming and Gambling The Loot Box Conundrum* (Utrecht University, August 2019)

<sup>28</sup> A. Drummond and J. Sauer, *Video game loot boxes are psychologically akin to gambling* (Nature Human Behaviour, 2018)

<sup>29</sup> Quebec Action (S.C.Q. 500-06-001132-212) and the B.C. Action (S.C.B.C. S-220088) against Epic Games Inc. for Canadian players of *Fornite: Save the World* and *Rocket League*



Same applied in Europe where in 2017, Belgium<sup>30</sup>, the Netherlands and Denmark opened investigations into *Overwatch*, the shooter from Activision Blizzard, and *Star Wars Battlefront II*<sup>31</sup>. This video game included a large number of microtransactions that were to have a significant impact on player progress through the game or its online parties: 2,100 dollars would be required to obtain the full content of the game, or 4,528 hours of play for the free version<sup>32</sup>. Unprecedented. As a result, EA has been hit by an avalanche of negative comments on sales platforms in recent days, prompting the publisher to react. This is no longer excesses of a *Free-to-Play* formula (as the entry price was indeed imposed), but rather a *Pay-to-Win*". In this particular model, players who pay have a clear advantage over those who don't pay<sup>33</sup>. A toxic gambling environment that crystallizes frictions between players according to their income, and encourages uninformed and unaware players to resort to gambling more regularly.

Newcastle University's research report<sup>34</sup>, published in 2022, aimed to analyze how children and young people engage with, understand and experience paid reward systems (chance-based mechanisms, in-game currencies, combat passes and direct purchases) in digital games (console, mobile and PC) and how these practices play out in domestic spaces. The research results highlights that it can and does cause harm to children and young people, including forms of financial and emotional harm. Children find it difficult to track their spending in digital games and fail to understand the value of money, creating inadequate conditions for making purchasing decisions. Also, the design of *in-game* paid reward systems borrows techniques from regulated gambling to entice players to engage for longer in digital games and spend more money.

This underlines a crucial point: the importance of a stylistic, aesthetic and accessible approach to the game environment, masking to children the purely economic interests and dangers involved. Indeed, *Fortnite* is slowly moving away from the pure gameplay to a virtual colored world where minors (and not always players) meet each other's, interact, dance and attend cultural events. In order to fully embrace this new type of entertainment, the company launched, in May 2020, *the Royal Party* mode within the game. It allows many players to relax in a session without builds and weapons, but punctuated by side activities. In this way, we might also imagine the great opportunity of a fully-fledged communication tool for Epic or other companies interested in this original advertising space. So, the time has come not just to spend money on video games, but to spend it in a virtual world of exchange and encounters, as in the Metaverse.

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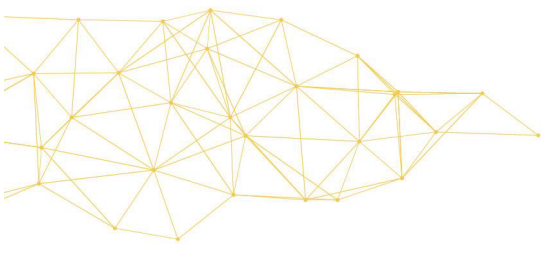
<sup>30</sup> Koen Geens Federaal volksvertegenwoordiger, *Loot boxen in drie videogames in strijd met kansspelwetgeving op*, 25 april 2018, <https://www.koengeens.be/news/2018/04/25/loot-boxen-in-drie-videogames-in-strijd-met-kansspelwetgeving>

<sup>31</sup> I. Taylor, *EA, Activision Blizzard, and Valve found in breach of Belgian gambling laws* (Gamesindustry, April 25, 2018), <https://www.gamesindustry.biz/three-industry-leading-publishers-found-in-breach-of-belgian-gambling-laws>

<sup>32</sup> M. Fernandez, *Star Wars Video Game Microtransactions Ignite Controversy*, (Variety, Nov 23, 2017) <https://variety.com/2017/digital/news/star-wars-video-game-controversy-microtransaction-loot-box-1202621913/>

<sup>33</sup> S. Darakjian, *Online Gaming and the Pay-To-Win Problem: Legal Deterrence or Industry Self-Regulation?*, Spring 2016

<sup>34</sup> J. Ash, R. Gordon and S. Mills, *Between Gaming and Gambling: Children, Young People, and Paid Reward Systems in Games* (Newcastle University, from August 2019 to July 2022).



## 2.2. The Play-to-Earn era

Metaverse is at the crossroads of collaborative, playful and lucrative worlds, offering users of all ages not just a game, but possession in a virtual world devoid of materiality. It means owning both the mobile and the immobile in one and the same world, through the purchase of a defined buy of land<sup>35</sup> and the furniture that will make up the newly acquired residence.

To expand your personal collection of virtual goods and protect against theft and scams, the price of rarity calls for the use of new technology<sup>36</sup>. The emergence of “non-fungible tokens”(hereafter “NFTs”) based on a “smart-contract”<sup>37</sup> is one such device.

Although the qualification of an NFT in European law remains imprecise, since it is not present in the MiCA legislation<sup>38</sup>, some countries have chosen to give it some, such as France, which in its article L.552-2 of the Code des Marchés Financiers designates it as: “(...)any intangible asset representing, in digital form, one or more rights that can be issued, registered, kept or transferred by means of a shared electronic recording device enabling the owner of the asset to be identified, directly or indirectly”. In other words, an NFT is the object of the transaction to which a certificate of authenticity is attached. The latter is not the representation of a value, or a means of exchange, and therefore does not signify ownership of the work, but of a simple digital copy, inspired by it. Its non-fungible nature guarantees that it is not interchangeable and cannot be replaced by something similar in appearance.

Much has already been written about the controversy surrounding NFTs, notably in Intellectual Property infringement concerning the confusion of authorship between the digitized work token and the original work itself<sup>39</sup>. Their highly volatile and speculative value calls for the utmost vigilance on the part of uninformed users such as children and teenagers, and, moreover, in the light of a new economic model called “Play-to-Earn”. Whether by trading accounts or cosmetic items, farming in-game resources to sell other players, or offering bots to automate tasks, underground markets that convert playtime to cash have flourished for a long while now<sup>40</sup>.

The “Play-to-earn” formula aims at monetizing the time playing, in cryptocurrencies or non-fungibles tokens by investing a significant amount of crypto capital at the outset. The objective is to let your investment grow within the framework of a randomized game. One of the popular “Play-to-earn” videogames is *Axie Infinity*<sup>41</sup>. In this case, players interact virtually through digital pets called “Axies”, a non-fungible token, which can be bought or sold on an in-game market, the *Ronin* network. The game develops its own crypto-currency, *Smooth Love Potion* (“SLP”), earned by players and spent on “breeding” new Axies, as well as another crypto-currency, *Axie Infinity Shards* (“AXS”). At its peak, *Axie Infinity* had over 2.7 million daily active users, but as the number of users grew<sup>42</sup>, the number of NFTs

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<sup>35</sup>N. Smaili and de A.Rancourt-Raymond, *Metaverse: welcome to the new fraud marketplace*(Journal of Financial Crime. 31, 2022)

<sup>36</sup> C. Shenghui, *Metaverse : concept, content and context* (Cham, Springer, 2023)

<sup>37</sup> *Ibid.*

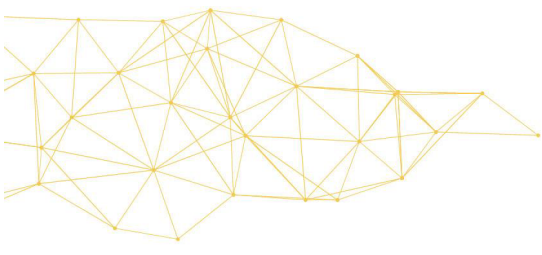
<sup>38</sup> Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets (“MiCA”), and amending Directive (EU) 2019/1937

<sup>39</sup> H. Maclean, *An Infringement Inside an Infringement, How Fortnite Is Exposing Copyright Double Standards*(The Pause Button, October 2, 2020)

<sup>40</sup> E. Ongweso Jr, *The Metaverse Has Bosses Too. Meet the ‘Managers’ of Axie Infinity* (Vice, February 2022) <https://www.vice.com/en/article/88g3ag/the-metaverse-has-bosses-too-meet-the-managers-of-axie-infinity>

<sup>41</sup> *Ibid.*

<sup>42</sup> Consumer Financial Protection Bureau, *Banking in video games and virtual worlds*, (April 2024)



needed to play became very expensive, leading to a hierarchy of players: those who invest, those who manage, and finally workers<sup>43</sup>. A “pyramid of Ponzi” made up of financial arrangements where time is monetized, valued and calculated in such a way that the return on crypto investment is as beneficial as online trading. The ecosystem largely collapsed in 2022 following an intrusion into the game by a state-sponsored hacker group<sup>44</sup>.

We could take a closer look and ask whether a certain “FOMO effect”, designed to encourage product consumption, might also have affected the young public. *Fear of Missing Out* (“FOMO”) is a condition when individuals experience fear if they fall behind by trends or by others<sup>45</sup>. Limited-time events, or seasonal events, where specific characters, skins, cosmetics, etc., provided by chance or money<sup>46</sup>, were already present in Fortnite “Battle Pass” system<sup>47</sup>.

A double phenomenon could apply, both to the loot boxes mentioned above and to the appeal that blockchain technology and fintech have had and continue to have. In this respect, we have already seen the emergence of the *Tezos* blockchain, specialized in crypto-gaming, as well as *Ubisoft's Quartz*. It offers players NFT “digits”, i.e. game objects (vehicles, weapons, equipment, etc.)<sup>48</sup> and further cementing the link between the two industries of the Metaverse and gaming.

The use of cryptocurrencies in a recreational format nonetheless raises suspicions about the very nature of this game, which cannot be perceived as a classic video game. “Play-to-Earn” is mostly trading in disguise, whose optimization, design and quality can quickly be limited in its development. If we consider that NFTs are the cement for structuring the new Metaverse, they (concretely) offer nothing new in the game experience or in the game design, except as a financial tool. This overuse of NFTs has intensified the anger and incomprehension of fans, and pushed some publishers to stop their Metaverse ambition. For instance, GSC Game World which announced NFTs (that allowed the owners to become a “metahuman”) in the video game *S.T.A.L.K.E.R. 2: Heart of Chernobyl* (December 2021), quickly dropped out this addition and apologized to their fans<sup>49</sup>. Let us remember that *Second Life* (considered as a former version of hypothetical Metaverse) was, at the time (2003), a video game based on a Metaverse prototype available without any kind of tokens.

*Second Life* itself offered “in-game currency”<sup>50</sup>, i.e. currency that could be exchanged for in-game items or used to bypass parts of the game. Indeed, digital games generally contain at least two different forms of currency: a premium currency that can be purchased with real money, and a currency that can be earned while playing. Sometimes, different forms of currency can be used to purchase the same in-game items, which can blur the distinction between earned and paid currency.<sup>51</sup> In *Second Life*, “residents”

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<sup>43</sup> E. Ongweso J, *Ibid.*

<sup>44</sup> *Banking in video games and virtual worlds, Ibid.*

<sup>45</sup> B. A. Faron, D Hastuti, Online gaming behavior among junior high school students: the role of parental control, fear of missing out (fomo), and self-control, Januari 2024, p: 65-76.

<sup>46</sup> J. Bycer, *How video games abuse the fear of missing out*, Game Developer, August 27, 2021.

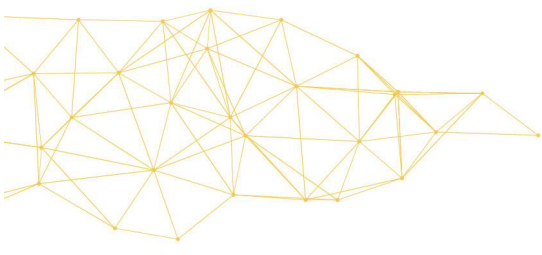
<sup>47</sup> M. Komad, *Product design and psychology: The Exploitation of Fear of Missing Out (FOMO) in Video Game Design*, August 5, 2023.

<sup>48</sup> MP. L'Hopitalier, G. Nadjombe, *NFT, opportunités économiques et défis juridiques* (Revue Lamy Droit de l'Immatériel, No 194, 1er juillet 2022)

<sup>49</sup> J. Peters, *S.T.A.L.K.E.R. 2 developer's deleted explanation for why you're getting NFTs*, (The Verge Dec 17, 2021), <https://www.vice.com/en/article/88g3ag/the-metaverse-has-bosses-too-meet-the-managers-of-axie-infinity>

<sup>50</sup> *Banking in video games and virtual worlds, Ibid.*

<sup>51</sup> *Between Gaming and Gambling, Ibid.*



exchange Linden dollars (L\$), which can be purchased both in-world and at Second Life's official Linden exchange (LindeX) with fiat currency. Linden dollars act like money, since the player can use them to buy and sell virtual objects, tip or pay other residents, and buy original services<sup>52</sup>. All Second Life accounts have a Linden dollar balance and a USD balance, and players can convert Linden dollars back to USD by selling Linden dollars on the Linden Exchange. The USD account balance can be withdrawn or used to pay for Second Life services such as subscriptions or fees.

A video game based on *in-game currency* cannot be designed for a young audience without guarantees of security. This is one of the conditions imposed by the Dutch<sup>53</sup> Consumer Protection Agency has argued that all *in-game* purchases (including loot boxes) must show their price in euros (even if they are not directly purchasable in euros), in addition to their price in terms of premium in-game currency<sup>54</sup>. The aim of this measure is to clearly indicate to players the cost of each in-game purchase in real monetary terms. Indeed, numerous young players have found it difficult to remember how much money they have spent in the game, particularly on loot boxes. There is no standard way of tracking spending in digital games as it is one of the recommendations of the Authority: *"Consumers must be able to make an informed decision. Essential information, such as the price, therefore, must be clear right at the start of every offer. In any case, you must provide other important information before consumers make their purchase. Are consumers required to create an account? In that case too, give all important information on time"*.

### 3. Progressive awareness and regulations for kids' safety within the Metaverse

#### 3.1. A system based on personal data massive processing and violence risk

While speculation and lack of transparency remain a major danger, they also lead to the dissemination of false information, scams, hacking and leakage of important data. A growing number of players are complaining of having been the victims of scams, theft and other losses, yet without the remedies or protections they might expect under federal consumer protection laws. This has led to an influx of phishing attempts and reports of account theft. Attackers often use compromised credentials to break into players' accounts and gain access to in-game currency or virtual items. They then use third-party systems to transfer game assets to another account or sell them for cash<sup>55</sup>. A recent study from 10,000 gamers globally showed that 63 percent of respondents feel their accounts aren't safe enough from attacks, with one in three reporting that their accounts had been hacked in the last two years.<sup>56</sup>

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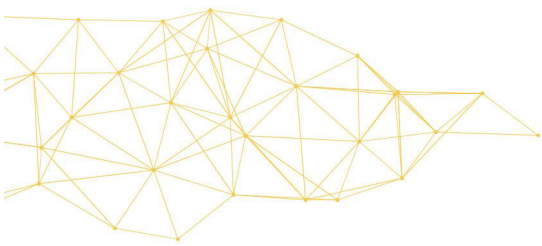
<sup>52</sup> AR. Asadi and R.Hemadi, *Understanding Virtual Currencies in Video Games: A Review* (109-117. 10.1109, 2018).

<sup>53</sup> Authority for Consumers & Markets, *Guidelines on the protection of the online consumer*, (May 2024) <https://www.acm.nl/nl/publicaties/voorlichting-aan-bedrijven/acm-leidraad/leidraad-bescherming-online-consument>

<sup>54</sup> L. Y. Xiao, *Loot box State of Play 2023: A global update on regulation* (GamesIndustry.biz, December 5, 2023)

<sup>55</sup> Mee Lan Han and al., *Cheating and Detection Method in Massively Multiplayer Online Role-Playing Game*, (Systemic Literature Review, 10 EEE Access 49050, May 12, 2022), <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9766355>.

<sup>56</sup> "Kaspersky commissioned Arlington Research to undertake quantitative online research with 10,000 gamers in 21 countries, including eSports athletes, gaming influencers, hardcore gamers, and gadget gamers." *Performance Addicted: Exploring Gamers' Priorities*, Kaspersky Daily (2022), <https://www.kaspersky.com/blog/gamers-report-2022/>.



Young *Roblox* players have been the target of significant hacking incidents. Vulnerabilities or weaknesses in a website's backend, or its content management system, are exploited by attackers who upload malicious PDF files to the website<sup>57</sup>. These “poisoned PDFs” are designed to appear in search engines and promote “free Fortnite skins”, generators of the game's currency Roblox. This misleading advertising entices young players to click on them, ultimately directing them to fraudulent landing pages. Concurrently, clicking will generate a maze of pages and end up downloading an application, entering personal details, or any other action required. Roblox's managing directors deny any liability, pointing out that using third-party services to “buy, sell, trade or give away Robux” is prohibited<sup>58</sup>, and that users should avoid “offers” on websites that promise free game currency or other items.

As a reminder, *Roblox* is an immersive game based on the Metaverse, one of the most popular for its accessibility and the adaptability shown by the publisher to enchant young audiences. Roblox promises a safe place where billions of people can come together with civility and optimism. While some Metaverse require the use of hardware, such as VR (virtual reality) or AR (augmented reality) technology to make the environment more “real”, Roblox has chosen to avoid any accessories that are too expensive or too dangerous, especially for young children and those suffering from certain neurodiverse diseases.<sup>59</sup> So, is Roblox genuinely concerned or simply interested in making money? Far from playing the ethical card, Roblox has been sued by a group of parents for gambling through Roblox (the *in-game* currency). As previously seen, microtransactions make the use of psychological triggers to encourage spending. Through pressure selling techniques such as limited-time offers, in-game rewards, and the promise of exclusivity, developers create a sense of urgency and the Fear Of Missing Out, as previously mentioned<sup>60</sup>. This can result in impulsive buying, leading players to spend more than what they have originally intended<sup>61</sup>.

According to the CFPB report<sup>62</sup>, “gaming companies collect large amounts of data on players, tracking purchase history, spending thresholds and location data. Gaming companies have also become adept at monetizing behavioral, personal and biometric data”.

To give an idea, 20 minutes of virtual reality (“VR”) can generate nearly 2 million data points and unique body language records such as gaze, gestures and facial expressions<sup>63</sup>. Indeed, AR/VR/MR headsets track a player's movements and physical behavior to render a VR scene used to interact with virtual environments. This data includes biometrics such as posture, gaze, gestures, facial expressions, voice, heart rate and interpersonal distance. Eye movement, pupil reaction and gait analysis are considered particularly sensitive<sup>64</sup>.

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<sup>57</sup> M. Burgess, A. *Huge Scam Targeting Kids With Roblox and Fortnite 'Offers' Has Been Hiding in Plain Sight* (Wired, Aug 14, 2023)

<sup>58</sup> *Ibid.*

<sup>59</sup> L.Higgins, *Le rôle de Roblox dans le Metaverse*, (Internet Matters, 5 août, 2022) <https://www.internetmatters.org/fr/hub/news-blogs/the-role-of-roblox-in-the-metaverse/>

<sup>60</sup> S. Ansari (*Ibid.*)

<sup>61</sup> S. Ansari (*Ibid.*)

<sup>62</sup> *Banking in video games and virtual worlds, Ibid.*

<sup>63</sup> J. Jerome and J. Greenberg, *Augmented Reality + Virtual reality: Privacy & Autonomy Considerations in Emerging, Immersive Digital Worlds*, (Future of Privacy, Apr. 2021)

<sup>64</sup> See FTC, Augmented Reality/Virtual Reality Panel moderated by Erik Martin, Office of Policy Planning (Transcript) 58 (Nov. 1, 2022), [https://www.ftc.gov/system/files/ftc\\_gov/pdf/privacycon-2022-transcript.pdf](https://www.ftc.gov/system/files/ftc_gov/pdf/privacycon-2022-transcript.pdf) ; see also Joseph Jerome & Jeremy Greenberg, *Augmented Reality + Virtual Reality: Privacy & Autonomy Considerations in Emerging, Immersive Digital Worlds*, (Future of Privacy, Apr. 2021), <https://fpf.org/wp-content/uploads/2021/04/FPF-ARVR-Report-4.16.21-Digital.pdf>.

Researchers have linked eye movement tracking to symptoms of ADHD<sup>65</sup> and Alzheimer's disease<sup>66</sup> and this data collection therefore presents privacy risks in the medical field.

Unlike traditional social media platforms, in the social Metaverse, users have no guarantee that the data they share is only shared with those they choose to share it with. A social metaverse player is not able to change the virtual properties of the constructed virtual world, According to Mystakidis (2022)<sup>67</sup>. There is a risk that gamers may be harmed when their data is sold, bought, and traded between companies, including for purposes outside of game play<sup>68</sup>.

Raising awareness of personal data protection for young people means knowing how to react to online harassment and reprimanding violent, offensive and dangerous behavior through increased moderation of online forums and communication channels. The Australian Government's eSafety Commissioner notes that "by providing hyper realistic experiences - where virtual sensations feel real - immersive technologies could increase the impact of negative interactions and lead to a rise in online assaults and abuse."<sup>69</sup> The case of child sexual abuse online is manifested by "using technology to produce, buy, sell, possess, distribute, or transmit sexually exploitative content involving children"<sup>70</sup>, such as: child pornography, live-streaming of child sexual abuse, child sex trafficking. The sextortion refers to grooming the engagement and formation of relationships with children, often by posing as another child, a friend or the opposite sex, with the aim of sextortion. This act of coercive violence is illustrated by "obtaining incriminating photos or information of minors and then threatening to expose them if the minors do not perform sex acts via web cameras"<sup>71</sup>. The anonymity of the profiles, the diversity of communication channels and the precise sampling of victims by their precocious age (generally between 10 and 17<sup>72</sup>), turn some video games into a high-risk area, where offenders are particularly active. According to Center for Countering Digital Hate « Users, including minors, are exposed to abusive behavior every seven minutes »<sup>73</sup>.

### 3.2. Regulations concerning minors and parental responsibility

Given the sensitivity of the data collected by private companies within the Metaverse, it is essential to make parents aware of the dangers and challenges to their children's safety and mental health in the Metaverse. It is also essential to contribute to the development of an effective moderation and control system, with the introduction of age verification systems.

First and foremost, we need to know how to seek consent from the parent/person with legal responsibility. It raises the question of consent for health data, which falls into the special category of data referred to as "sensitive data" in Article 9 of the General Data

<sup>65</sup> J Lundin Kleberg, M A Frick and Karin C. Brocki, *Eye-Movement Indices of Arousal Predict ADHD and Comorbid Externalizing Symptoms over a 2-Year Period*, (13 Sci. Reports 6-8, March 23, 2023), <https://doi.org/10.1038/s41598-023-31697-3>.

<sup>66</sup> *Ibid.*

<sup>67</sup> S. Mystakidis, "Metaverse" (Encyclopedia, Vol. 2 No. 1, pp. 486-497 2022, doi: 10.3390/encyclopedia2010031).

<sup>68</sup> N. Smaili and de A Rancourt-Raymond, *Metaverse: welcome to the new fraud marketplace* (Journal of Financial Crime. 31, 2022)

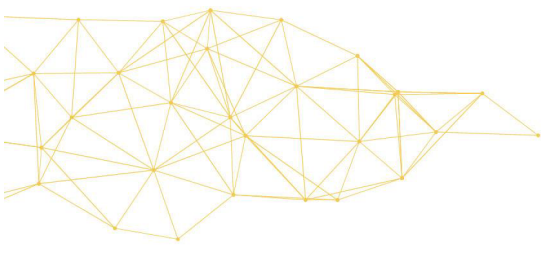
<sup>69</sup> eSafety commissioner, 2020 quoted by *The Metaverse, Extended Reality And Children* (UNICEF, May 2023)

<sup>70</sup> M. Kavenagh, *Child Sexual Exploitation in Online Gaming, Risks and Realities* (UNICEF, November 17, 2023)

<sup>71</sup> The National Strategy for Child Exploitation Prevention and Interdiction, April 2016, US Department of Justice

<sup>72</sup> *Ibid.*

<sup>73</sup> Center for Countering Digital Hate, Research 2021.



Protection Regulation (hereafter “GDPR”). The scope of Article 9 is deliberately broad, using generic terms by defying “biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural person's sex life or sexual orientation”. The GDPR also leaves room for Member States to specify its rules, including the processing of special categories of personal data. In this respect, this Regulation does not preclude the right of Member States to specify the circumstances of certain processing situations, including by establishing more precisely the conditions under which the processing of personal data is lawful (Recital 10, GDPR).

In France, for instance, Article 45 of the Data Protection Act<sup>74</sup> stipulates that under the age of 15, the data controller must obtain “double consent”: that of the minor and that of the person exercising parental authority. This protection applies in particular to processing aimed at children for marketing purposes, or for the creation of user profiles on social networks/online video game platforms<sup>75</sup>. More specifically, this could involve choosing a public or private profile on a social network, or activating geolocation. On the other hand, for data processing resulting from contracts concluded online with the service provider, either the minor can conclude such a contract himself or herself, or the holders of parental authority can conclude it on his or her behalf<sup>76</sup>. The French data protection authority, Commission nationale de l'informatique et des libertés (hereafter “CNIL”), recommended, “taking into account the child's level of maturity. It is not possible to understand the expression of a child's will in the same way, depending on whether he or she is 7 or 14 years old. (...) One answer to this problem can be found in the logic of the principle of association of the minor with decisions that concern him or her, derived from civil law. Asking the parent to consent alongside his or her child not only guarantees the quality of the consent given, but also encourages the parent to seek out and take into account the minor's opinion”.<sup>77</sup>

There are, moreover, justified concerns regarding the transfer of data with the user's consent, as the European Parliament pointed out<sup>78</sup>. In the framework of the Metaverse data protection authorities face difficulties in verifying whether their citizens' data is used across jurisdictions and sectors in compliance with applicable laws. The “borderless” nature of Metaverse means that, while we can assume that the GDPR will apply, clauses dealing with the transfer and processing of data outside the EU may need to be clarified. Article 3(2) of the GDPR states that the legal protection regime could apply “with a controller or processor not established in the Union, where the data processing or activities are related to the provision of goods or services to such persons in the Union”. A broad interpretation that could shelter the European player, as long as the controllers and processors interacting within the immersive Metaverse experience can be clearly identified. A difficulty when various technologies underpin the metaverse, and the greater number of providers of different services that will make the metaverse more distributed. Collectively, this will make it more difficult to determine responsibilities and obligations<sup>79</sup>.

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<sup>74</sup> Loi Informatique et Libertés (January 1978), as amended by decree n° 2019-536 du 29 mai 2019.

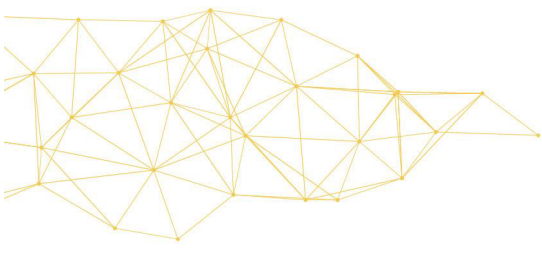
<sup>75</sup> A. Dubarry and A Puig, *RGPD : quelle protection pour les données personnelles des mineurs ?*, Haas Avocat.

<sup>76</sup> CNIL, *Recommandation 4 : rechercher le consentement d'un parent pour les mineurs de moins de 15 ans*, (09 juin 2021) <https://www.cnil.fr/fr/recommandation-4-rechercher-le-consentement-dun-parent-pour-les-mineurs-de-moins-de-15-ans>

<sup>77</sup> *Ibid.*

<sup>78</sup> European Parliament, Resolution of the 5 May 2022 on competition policy, (annual report 2021', 2021/2185 (ini), 2022) [https://www.europarl.europa.eu/doceo/document/ta-9-2022-0202\\_en.html](https://www.europarl.europa.eu/doceo/document/ta-9-2022-0202_en.html)

<sup>79</sup> N. P. Jannuzzi and N. Pappas, *Reed Smith guide to the metaverse*, (2nd edition, reed Smith, 2022) <https://www.reedsmith.com/en/perspectives/metaverse/2022/08/data-protection-and-privacy>



Europe is therefore distinguished by the overlapping protection regime contained in the Digital Service Act. The latter prohibits online platforms (including virtual worlds) from targeting advertising on the basis of minors' personal data. It also strengthens content moderation rules and requires the biggest platforms to deal with systemic risks such as the dissemination of illegal content.<sup>80</sup> In the face of these extremely serious situations, it is important to remember that child protection is regulated internationally by the United Nations Committee on the Rights of the Child (UNCRC). The concept of the "best interest of the child" is therefore internationally recognized, which is to be understood as the main consideration when decisions or actions are taken that affect children, and encourages the interpretation most likely to protect this principle.

An essential and complementary solution would be to impose an age limit on the use of Metaverse-related content. From chat channels to headset use, the diversification of age control methods could contribute to greater protection. Indeed, if "self-declaration" can be easily bypassed by children<sup>81</sup>, a mandatory parental consent as well as Digital ID could surely be more efficient<sup>82</sup>. In this perspective, the European Commission put forward a proposal to update the European digital identity framework<sup>83</sup>. This would allow citizens across the EU to identify and authenticate themselves online (through their European digital identity wallet), share digital documents or prove a specific identity attribute such as age. In addition, the proposal for a regulation to combat child sexual abuse<sup>84</sup> online envisages improved online age verification.

The "credit card method"<sup>85</sup>, on the other hand, might require users to check the validity of their cards, for example, by making a bank or card payment of €0.01. This method is mainly used by e-commerce sites and applications selling adult products such as alcohol or adult content. However, in addition to the inherent risk of phishing, it is not possible to ensure that the person using the card is the legitimate owner, and the age limit for owning a credit card varies from country to country.<sup>86</sup> The balance between privacy and age at entry almost paradoxically calls for a reduction in the use of sophisticated control instruments (biometric control and artificial intelligence) and thus limits the scope for surveillance.

Finally, the question of internal regulation by the platforms would, without doubt, be essential to the implementation of a common code of conduct for the Big Tech (Meta, Microsoft, Apple...) of the Metaverse. Meta, a leader in the field with nearly \$15 billion invested in the industry, is applying what it is currently doing to social networks: various methods to verify the child's age, content moderation, privacy settings, personal boundary, default settings for minors and parental control features<sup>87</sup>, as it is mentioned on the website: "Your teen can change their voice mode, blurred chats, world chat filter and

<sup>80</sup> M. Niestadt, *Protecting children in virtual worlds (the metaverse)* (European Parliamentary Research Service, At a glance, Digital issues in focus, April 2024)

<sup>81</sup> by example, include self-declaring one's date of birth

<sup>82</sup> M. Negreiro, *Online age verification methods for children* (European Parliamentary Research Service, At a glance, Digital issues in focus, February 2023)

<sup>83</sup> Proposal for a European Digital Identity Regulation ("EU eID proposal"), [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity\\_fr](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_fr)

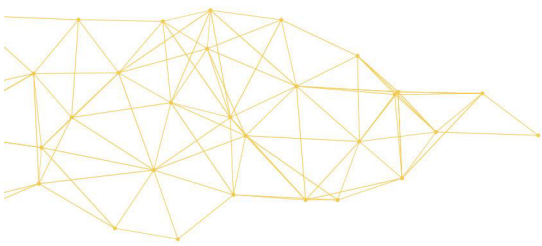
<sup>84</sup> Proposal for a regulation laying down the rules to prevent and combat child, *Complementary impact assessment*, (European Parliamentary Research Service, April 2023)

<sup>85</sup> M. Negreiro, *Online age verification methods for children* (European Parliamentary Research Service, At a glance, Digital issues in focus, February 2023)

<sup>86</sup> M. Niestadt, *Protecting children in virtual worlds (the metaverse)* (European Parliamentary Research Service, At a glance, Digital issues in focus, April 2024)

<sup>87</sup> *Ibid.*





*personal boundary anytime unless you lock those settings. If you lock them, your teen will need to send a request to change their settings to be less restrictive*<sup>88</sup>. However, the conditions of use are by definition at the discretion of the providers, who decide on the control parameters according to their economic objectives: in 2013 Meta lowered its Quest headsets' minimum age from 13 to 10 years and *Horizon World*, the Meta's Metaverse, is accessible at the same age, i.e. 10 years.

#### 4. Conclusion

From Sandbox video games, in which the player is not constrained to achieve specific objectives and has great freedom of exploration, to MMORPGs where players are stimulated by their close collaboration with the wider community, video games are at the origin of the free thinking shared by the Metaverse. As mentioned in my analysis, whereas video games were initially designed to be playful, the Metaverse aims to push back the frontiers of entertainment by building up a genuine digital estate, through the massive acquisition of non-fungible tokens. New marketing strategies are emerging from both worlds to create a business model based on the profitability of game time by transforming it into cryptocurrencies. These crypto-assets take place in a controversial ecosystem already composed of loot-boxes and cosmetics, previously criticized and sometimes prohibited by foreign public authorities for minor players. The Metaverse's infinite imagination cannot be surpassed by its highly speculative environment, which would quickly overwhelm young users and players, as well as their parents. Even if Europe were to embody a more ethical third way in its regulations, the Metaverse remains a private and lucrative domain. Its declining popularity<sup>89</sup>, as evidenced by Meta's billion-dollar losses, is likely to result in either the young public abandoning it, or in a legal void. It is therefore crucial for the development of such an environment to introduce moderation and regulations appropriately and pursue work on controlling the age and consent of young players.

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<sup>88</sup>Set up and access parental supervision in Meta Horizon Worlds, <https://www.meta.com/fr-fr/help/quest/articles/horizon/safety-and-privacy-in-horizon-worlds/set-up-parental-supervision-horizon-worlds/>

<sup>89</sup> High loss of \$76.8 billion, Meta's share price was also divided by 3.



## Bibliography

Ambalina L, *Understanding the Minecraft Metaverse* (Hackernoon, September 27, 2022)

Ansari S, *The Economics of Microtransactions* (August 03, 2023),  
<https://www.economicsonline.co.uk/definitions/the-rise-of-microtransactions-in-video-games.html/>

Ash J, Gordon R and Mills S, *Between Gaming and Gambling: Children, Young People, and Paid Reward Systems in Games* (Newcastle University, from August 2019 to July 2022)

Authority for Consumers & Markets, *Guidelines on the protection of the online consumer* (May 2024) <https://www.acm.nl/nl/publicaties/voorlichting-aan-bedrijven/acm-leidraad/leidraad-bescherming-online-consument>

Assassin's Creed: Revelations – A Homecoming (2011), developed by Ubisoft Montréal and published by Ubisoft

A Timeline of Video Game Controversies, National Coalition Against Censorship,  
<https://ncac.org/resource/a-timeline-of-video-game-controversies>

Burgess M, *A Huge Scam Targeting Kids With Roblox and Fortnite 'Offers' Has Been Hiding in Plain Sight* (Wired, Aug 14, 2023)

Bycer J, *How video games abuse the fear of missing out*, Game Developer, August 27, 2021

Chester Cheong B, *Avatars in the metaverse: potential legal issues and remedies* (3:2 International Cybersecurity Law Review 467 494, 2022)

Chomiac PX, *L'encadrement juridique des nouveaux moyens de monétisation d'un jeu video* (Village Justice, mai 2020)

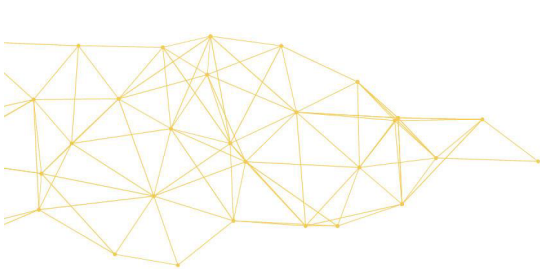
CNIL, *Recommandation 4 : rechercher le consentement d'un parent pour les mineurs de moins de 15 ans*, (09 juin 2021) <https://www.cnil.fr/fr/recommandation-4-rechercher-le-consentement-dun-parent-pour-les-mineurs-de-moins-de-15-ans>

Consumer Financial Protection Bureau, *Banking in video games and virtual worlds* (April 2024)

Darakjian S, *Online Gaming and the Pay-To-Win Problem: Legal Deterrence or Industry Self-Regulation?*, Spring 2016

de Leeuw F, *The Convergence of Gaming and Gambling The Loot Box Conundrum* (Utrecht University, August 2019)

Drummond A and Sauer J, *Video game loot boxes are psychologically akin to gambling* (Nature Human Behaviour, 2018)



Dubarry A and Puig A, *RGPD : quelle protection pour les données personnelles des mineurs?*, Haas Avocat

European Parliament, *Resolution of the 5 may 2022 on competition policy (annual report 2021, 2021/2185 (ini), 2022)* [https://www.europarl.europa.eu/doceo/document/ta-9-2022-0202\\_en.html](https://www.europarl.europa.eu/doceo/document/ta-9-2022-0202_en.html)

EJ Lee, HS Kim and Choi S, *Violent Video Games and Aggression: Stimulation or Catharsis or Both?* (Cyberpsychol Behav Soc Netw. 2021 Jan;24(1):41-47)

eSafety commissioner, 2020 quoted by The Metaverse, *Extended Reality and Children* (UNICEF, May 2023)

Fernandez M, *Star Wars Video Game Microtransactions Ignite Controversy*, (Variety, Nov 23, 2017) <https://variety.com/2017/digital/news/star-wars-video-game-controversy-microtransaction-loot-box-1202621913/>

Fortnite and Travis Scott present: Astronomical, <https://www.fortnite.com/news/astronomical>

FTC, *Augmented Reality/Virtual Reality Panel moderated by Erik Martin, Office of Policy Planning (Transcript)* 58 (Nov. 1, 2022), [https://www.ftc.gov/system/files/ftc\\_gov/pdf/privacycon-2022-transcript.pdf](https://www.ftc.gov/system/files/ftc_gov/pdf/privacycon-2022-transcript.pdf) ; see also

Geens K, *Federaal volksvertegenwoordiger, Loot boxen in drie videogames in strijd met kansspelwetgeving op*, 25 april 2018, <https://www.koengeens.be/news/2018/04/25/loot-boxen-in-drie-videogames-in-strijd-met-kansspelwetgeving>

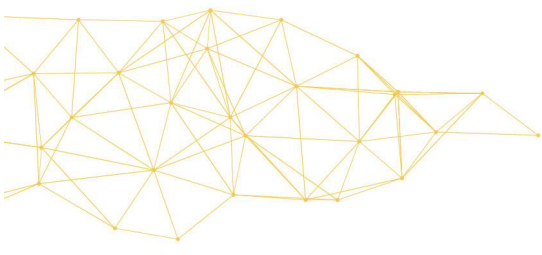
Higgins L, *Le rôle de Roblox dans le Metaverse*, (Internet Matters, 5 août, 2022) <https://www.internetmatters.org/fr/hub/news-blogs/the-role-of-roblox-in-the-metaverse/>

Taylor, EA, Activision Blizzard, and Valve found in breach of Belgian gambling laws (Gamesindustry, April 25, 2018), <https://www.gamesindustry.biz/three-industry-leading-publishers-found-in-breach-of-belgian-gambling-laws>

Jannuzzi N.P and Pappas N, *Reed Smith guide to the metaverse*, (2nd edition, reed Smith, 2022) <https://www.reedsmith.com/en/perspectives/metaverse/2022/08/data-protection-and-privacy>

Jerome J and Greenberg J, *Augmented Reality + Virtual reality: Privacy & Autonomy Considerations in Emerging, Immersive Digital Worlds*, (Future of Privacy, Apr. 2021)

Joseph Jerome & Jeremy Greenberg, *Augmented Reality + Virtual Reality: Privacy & Autonomy Considerations in Emerging, Immersive Digital Worlds*, (Future of Privacy, Apr. 2021), <https://fpf.org/wp-content/uploads/2021/04/FPF-ARVR-Report-4.16.21-Digital.pdf>



Kavenagh M, *Child Sexual Exploitation in Online Gaming, Risks and Realities* (UNICEF, November 17, 2023)

Kaspersky commissioned Arlington Research to undertake quantitative online research with 10,000 gamers in 21 countries, including eSports athletes, gaming influencers, hardcore gamers, and gadget gamers. *Performance Addicted: Exploring Gamers' Priorities*, Kaspersky Daily (2022), <https://www.kaspersky.com/blog/gamers-report-2022/>

Koen Geens Federaal volksvertegenwoordiger, *Loot boxen in drie videogames in strijd met kansspelwetgeving op, 25 april 2018*, <https://www.koengeens.be/news/2018/04/25/loot-boxen-in-drie-videogames-in-strijd-met-kansspelwetgeving>

L'Hopitalier MP, Nadjombe G, *NFT, opportunités économiques et défis juridiques* (Revue Lamy Droit de l'Immatériel, No 194, 1er juillet 2022)

Leeuw F de, *The Convergence of Gaming and Gambling The Loot Box Conundrum* (Utrecht University, August 2019)

Lemmer Webber C, *Mastodon launches their ActivityPub support, and a new CR!* (ActivityPub, 10 September 2017), <https://activitypub.rocks/news/2017-09-10-mastodon-launches-their-activitypub-support-and-a-new-cr/>

Lundin Kleberg J., Frick M.A. and Brocki K.C., *Eye-Movement Indices of Arousal Predict ADHD and Comorbid Externalizing Symptoms over a 2-Year Period*, (13 Sci. Reports 6-8, March 23, 2023), <https://doi.org/10.1038/s41598-023-31697-3>.

Maclean H, *An Infringement Inside an Infringement, How Fortnite Is Exposing Copyright Double Standards* (The Pause Button, October 2, 2020)

Markey P and Ferguson C, *Moral Combat: Why the War on Violent Video Games Is Wrong* (BenBella Books, Inc. 2017) referring in particular to the Columbine mass shootings in 1999, which raised questions about the link between violence and video games.

Mee Lan Han and al., *Cheating and Detection Method in Massively Multiplayer Online Role-Playing Game*, (Systemic Literature Review, 10 EEE Access 49050, May 12, 2022), <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9766355>.

Mystakidis S, "Metaverse" (Encyclopedia, Vol. 2 No. 1, pp. 486-497 2022, doi: 10.3390/encyclopedia2010031).

Negreiro M, *Online age verification methods for children* (European Parliamentary Research Service, At a glance, Digital issues in focus, February 2023)

Newzoo Gamer Insights, *The Future of Gaming*, (February 2022 – April 2022)

Niestadt M, *Protecting children in virtual worlds (the metaverse)* (European Parliamentary Research Service, At a glance, Digital issues in focus, April 2024)



Ongweso Jr E, *The Metaverse Has Bosses Too. Meet the 'Managers' of Axie Infinity* (Vice, February 2022) <https://www.vice.com/en/article/88g3ag/the-metaverse-has-bosses-too-meet-the-managers-of-axie-infinity>

Proposal for a European Digital Identity Regulation ("EU eID proposal"), [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity\\_fr](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_fr)

Proposal for a Regulation of the European Parliament and of the Council on Markets in Crypto-assets ("MiCA"), and amending Directive (EU) 2019/1937

Proposal for a regulation laying down the rules to prevent and combat child, *Complementary impact assessment* (European Parliamentary Research Service, April 2023)

Quebec Action (S.C.Q. 500-06-001132-212) and the B.C. Action (S.C.B.C. S-220088) against Epic Games Inc. for Canadian players of Fortnite: Save the World and Rocket League

Smaili N and de A Rancourt-Raymond, *Metaverse: welcome to the new fraud marketplace* (Journal of Financial Crime. 31, 2022)

Sirinelli P and Prévost S, *Ready Lawyer One !* (Daloz IP/IT, Daloz, 2020)  
Set up and access parental supervision in Meta Horizon Worlds, <https://www.meta.com/fr-fr/help/quest/articles/horizon/safety-and-privacy-in-horizon-worlds/set-up-parental-supervision-horizon-worlds/>

Shenghui C, *Metaverse: concept, content and context* (Cham, Springer, 2023)

Steam Support, *Family View mode mentioning: "You can use Family View to limit an account's access to a subset of its content and features. With Family View, access to the Steam Store, Library, Community, Friends content and other features may be gated by the entry of a secret PIN"*. <https://help.steampowered.com/en/faqs/view/6B1A-66BE-E911-3D98>

Taylor I, *EA, Activision Blizzard, and Valve found in breach of Belgian gambling laws* (Gamesindustry, April 25, 2018), <https://www.gamesindustry.biz/three-industry-leading-publishers-found-in-breach-of-belgian-gambling-laws>

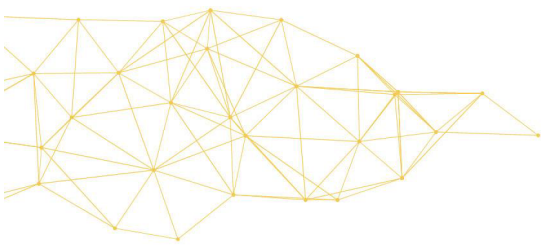
The National Strategy for Child Exploitation Prevention and Interdiction, April 2016, US Department of Justice

Understanding Virtual Currencies in Video Games: A Review (AR Asadi and R Hemadi, 109-117. 10.1109, 2018).

UNICEF, *Child Sexual Exploitation in Online Gaming, Risks and Realities* (UNICEF, November 17, 2023)

UNICEF, *The Metaverse, Extended Reality and Children* (UNICEF, May 2023)

Violent Video Games and Aggression, *Stimulation or Catharsis or Both?* (EJ Lee, HS Kim and Choi S. Cyberpsychol Behav Soc Netw. 2021 Jan;24(1):41-47)



Y. Xiao L, *Loot box State of Play 2023: A global update on regulation* (GamesIndustry.biz, December 5, 2023)

2023 Global Games Market Report, Newzoo: "The overall growth of the 2023 games market toward 2026. After recovering in 2022, the global games market will generate revenues of \$183.9 billion, with year-on-year growth of +0.5%", <https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version>



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