Selling LAND in Decentraland: The Regime of Non-fungible Tokens on the Ethereum Blockchain Under the Digital Content Directive

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Abstract Rewind to the early 1990s: an infant World Wide Web recently created by Tim Berners-Lee was starting to redefine the way people were connected globally. First came communication services (e.g. e-mail) and a shift from physical to digital marketplaces (e.g. ecommerce). Then came the rise of Internet platforms, in what is now deemed to be Web 2.0. The critics of Web 2.0 claim it is a spoiled version of early Internet promises: freedom from surveillance, online safety (even through anonymity)—in a nutshell, more control and power for the user. The answer to the problems of Web 2.0 is thought to be the third era of the Internet, namely the Decentralized Internet, based on (among others) blockchain technology. While a lot of literature has focused on the legal implications of blockchain assets such as cryptocurrencies from a banking perspective, not the same can be said about the consumer protection angle necessary in tackling the hype that has affected users who spent valuable financial resources on investing, playing on or using blockchain-based platforms. This chapter aims to make a contribution to fill this research gap, and focus on Decentraland, a virtual world where LAND, a non-fungible token is traded in order to allow users to build their own spaces on these plots. In doing so, the chapter elaborates on the notion of Internet of Value, and looks at the inner workins of Decentraland from the perspective of European law, more specifically the Digital Content Directive.

Keywords Decentraland · Blockchain · Digital Content Directive · Consumer protection · Tokens · Internet of value

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1 Introduction

Rewind to the early 1990s: an infant World Wide Web recently created by Tim Berners-Lee was starting to redefine the way people were connected globally. First came communication services (e.g. e-mail) and a shift from physical to digital marketplaces (e.g. ecommerce). Then came the rise of Internet platforms, in what is now deemed to be Web 2.0—prosumers generate content on social media platforms such as Youtube, Facebook, Instagram (e.g. social media), or offer their individual services on peer-to-peer or gig platforms such as Uber, AirBnB or Taskrabbit. These developments have been both lauded and criticized. On the one hand, the Internet as we know it dissolved geographic distances, created new industries, facilitated the distribution of goods of services and empowered individual employment. On the other hand, it gave rise to new questions about what is real and what is fake: what to do if someone posts fake reviews; who to hold accountable for fake news; how to prevent a new wave of labour exploitation, etc. The critics of Web 2.0 claim it is a spoiled version of early Internet promises: freedom from surveillance, online safety (even through anonymity)—in a nutshell, more control and power for the user. Painful public scandals like the sort of Equifax or Cambridge Analytica make it easy to argue that with the rise of data as a commodity, Internet users have indeed lost a lot of this control to data brokers, surveillance agencies and hackers.

The answer to the problems of Web 2.0 is thought to be the third era of the Internet, namely the Decentralized Internet. Blockchain platforms like Steem are used to make decentralized equivalents of a lot of apps we have grown accustomed to: DTube instead of Youtube (DTube, n.d.), Graphite Docs instead of Google Docs (Graphite, n.d.), or Storj instead of iCloud (Decentralized Cloud Storage—Storj, n.d.). The main benefit of decentralization—beyond privacy—is said to be the freedom from monopolies held by centralized platforms that now determine, through their own intransparent algorithms, who gets to see what information on the web. In addition, decentralization proposes a new, trustless constellation of behavioural incentives (e.g. Smart Media Tokens, etc.) and communication infrastructure devoid of intermediaries.

However, while there might be strong market opportunities to embrace in a new Internet era, the law does not move into new ages with the same speed. Decentralization has already been occurring, not in terms of communication infrastructure, but human infrastructures, in the form of individual accessibility: citizen reporters are disrupting press, entertainment and advertising services, and gig drivers are replacing taxis. Emerging practical issues are under-regulated, and challenge legal systems to determine if their classical paradigms are still fitting: is posting fake negative reviews a crime? Are Youtubers professionals or individuals? Do Internet platforms have a duty of care towards their users? Moreover, not just public institutions, but platforms themselves face a problem of scale, and struggle with enforcing legal standards. These are problems that have yet to be solved, which a new Internet version might very well inherit. In spite of such concerns, increased attention is paid to the technology conjured as the game-changer of Internet

architecture: blockchain. Expected to hit over $12 billion in investment by 2022 (Mearian, 2019), the blockchain-based array of products has significantly expanded in the past decade. Since Satoshi Nakamoto's famous white paper on Bitcoin back in 2008 (Nakamoto, 2009), blockchain has matured into an ideology that currently fuels more than cryptocurrencies. Or does it?

This chapter focuses on Decentraland as a virtual world where LAND, a non-fungible token is traded in order to allow users to build their own spaces on these plots. This inquiry into Decentraland classifies LAND as digital content, and thus asks the question of what compliance issues may arise out of the application of Directive 2019/770 (the Digital Content Directive) to Decentraland in general, and LAND in particular. While a lot of literature has focused on the legal implications of cryptocurrencies from a banking perspective, not the same can be said about the consumer protection angle necessary in tackling the hype that has affected users who spent valuable financial resources on investing, playing on or using blockchain-based platforms. This chapter aims to make a contribution to fill this research gap, and shed light on some of the considerations which platforms such as Decentraland ought to pay close attention to when creating consumer content or services. To this end, the chapter is structured as follows. Section 2 addresses the development of blockchain products beyond cryptocurrencies and as digital content, under the moniker of Internet of Value. Section 3 describes Decentraland in detail, and explains the role of LAND in the platform's constellation of tools and content. Lastly, Section 4 explores some of the core tenets of the Digital Content Directive and applies specific articles to Decentraland's architecture. Section 5 concludes.

2 The Internet of Value

The Internet facilitated the creation of virtual communities (Abrahams, 2007; Chesney, Chuah, & Hoffmann, 2009; Decentraland, a Virtual World on Open Standards, n.d.; Manning, 2019; Sundquist, 2012), from message boards (Hansen, Shneiderman, & Smith, 2011b; Lidsky, 2009; Wein, 2001) to gaming (Berger, Jucker, & Locher, 2016; Boellstorff, 2015; Karniell & Bates, 2010; Klastrup, 2009; Krzywinska, 2006; Malaby, 2011; Pearce, 2011; Taylor, 2009) and social media (Garofalo, 2013; Hansen, Shneiderman, & Smith, 2011a, c). The appeal of virtual worlds is said to draw on a so-called property of 'worldness', which according to Klastrup emerges out of 'the complex interplay between (a) the aesthetics of the gameworld as both an actualised explorable and mentally imagined universe; (b) the experiences and means of expression the world as a game system and tool allows and affords; (c) the social interaction in and about the world' (Klastrup, 2009). A lot of these communities evolved in plain sight, albeit in designated spaces, such as game worlds. However, a lot of other communities chose to be more protective of their identity and activities, due to a plethora of reasons, such as engaging in illegal trade (e.g. the Silk Road marketplace), (Chen, 2011) or supporting social movements against surveillance (e.g. Riseup.net). Cryptography facilitated the veiling of

online activities, and communities deploying it for various functions (e.g. identity; communication), while building an ideology around the importance of cryptography are referred to as cryptocommunities.[1]

Early on, during the rise of personal computing in the 1980s, when cypherpunks like Tim May became public proponents of cryptolibertarianism (Hughes, 1993; Popper, 2018), cryptocommunities were mainly using digital technologies for communication purposes. It was during this period that David Chaum tried, albeit unsuccessfully, to create digital cash which would allow secure and private currency transfers to take place without surveillance from state or commercial entities such as banks (Khan, 2016; McCullagh, 2001; Mowbray, 2006). This changed for the second generation cryptocommunities, as dark marketplaces such as the Silk Road had already started using cryptocurrencies (e.g. Bitcoin) as of early 2011. While the Bitcoin White Paper acknowledged the role of the original cryptocurrency as 'online cash' (Nakamoto, 2009), labelling cryptocurrencies as money is no easy task (Adimi, 2018; Alvarez, 2018; Gikay, 2018; Liedel, 2018). For instance, in 2014, the Dutch Court of Overijssel analysed the nature of the Bitcoin cryptocurrency, to determine whether it may be categorized as 'money' under Article 6:112 of the Dutch Civil Code.[2] The court found that even though in principle this article allowed for payment in currencies not originating directly from the state, to be considered 'money', the currency in question must be a legal tender, which was not the case for Bitcoin.[3]

In more recent iterations, cryptocommunities are becoming even more sophisticated in their use of cryptography. With over 1200 types of cryptocurrencies listed on Coinmarketcap in 2019, the concept of digital currencies as tech alternatives to national currencies designed to eliminate financial intermediation gradually morphed into a more general expression of value. This is known as the 'Internet of Value' (The Internet of Value, 2017; Consultant, 2019) where value is 'to be exchanged as quickly as information' (The Internet of Value, 2017). IoV entails the digitalization of assets such as 'intellectual and digital properties, equity and wealth', as well as their transfer in an 'automated, secure, and convenient manner' (Truong, Um, Zhou, & Lee, 2018). Other views expand the asset category also to 'likes' and 'favourites', beyond the exchange of money and currencies (Skinner, 2016), which is made possible due to the creation of an ecosystem of

[1] Catalina Goanta and Marieke Hopman, 'Cryptocommunities as Legal Orders' (2020) Internet Policy Review, 9(2), retrieved from https://policyreview.info/articles/analysis/crypto-communities-legal-orders. For an expression of the cryptolibertarian ideology on the Silk Road, see for instance a forum post by Dread Pirate Roberts, the administrator of the first iteration of the Silk Road, about the platform's goal: 'Money is a tool, a means to an end. Our end here at Silk Road is not the accumulation of money, or the comfort and security it brings (not that there's anything wrong with that). Our end is freedom from tyranny, and secured basic human rights for the people of the world. As awesome as it is, Silk Road is just the beginning in what will likely be a long journey', <https://antilop.cc/sr/users/dpr/messages/20110727-0707-625-Re_SilkRoad_Fees.txt>, accessed 26 October 2019.

[2] Rechtbank Overijssel, 14 May 2014, ECLI:NL:RBOVE:2014:2667.

[3] Ibid.

blockchain-based applications and services facilitated by platforms such as Ethereum (Davidson, De Filippi, & Potts, 2018).

Illustrating the wide array of this ecosystem are decentralized applications such as Cryptokitties and Decentraland (Ducuing, 2019; Lee, Yoo, & Jang, 2019). In the case of a cryptocurrency like Bitcoin, 'the global log of transactions is jointly maintained by users' computers; distributed cryptography substitutes for centralized anti-forgery controls. The supply of Bitcoins is controlled by a function embedded in the cryptographic protocols, not by a single authority with the power to confiscate them or to make more' (Grimmelmann, 2014). In the case of both Cryptokitties and Decentraland, there is an underlying cryptocurrency (e.g. Ether or 'MANA'), but there is also something more, namely breeding and collecting digital cats as a non-fungible token (NFT), and buying 'LAND' in a virtual world. As the central example in this chapter, the latter is elaborated upon in the following section.

3 Decentraland

This section aims to give the reader an overview of what Decentraland is, how it works, and how the law categorizes the various transactions on which this platform rests.

As mentioned above, Decentraland is a virtual world built on the Ethereum blockchain. According to the platform, it is 'owned by its users', who can '[b]uild, explore, and earn money from [their] creations' Decentraland, a Virtual World on Open Standards, n.d.). Users can buy LAND (virtual content) using MANA, an ERC-20 token designed and used exclusively on Ethereum Decentraland, a Virtual World on Open Standards, n.d.), in this case to power the economy of the virtual world as a currency (Casper, 2018; Song, Chang, & Song, 2019; William, 2018). MANA was generated through an 'initial coin offering in August of 2017 and raised approximately $24 million worth of ETH, BTC, and other cryptocurrencies' (Buchko, 2018). Forty percent of the initial supply of MANA (a total of 2,644,403,343) was sold in the initial coin offering, with an additional 20% distributed to the community and partners, 20% to the founding team and 20% to the Decentraland foundation (Buchko, 2018). Users were then able to purchase LAND during two auctions, in December 2018 and December 2018, and once the purchases were made, the MANA spent on them 'was burned, meaning that the tokens were either deleted or sent to an empty, irretrievable address' (Buchko, 2018). In addition, users may sell LAND at their discretion. But what exactly is LAND? The present section tackles this question by looking into the Terms of Service and the Content Policy of Decentraland.

According to the Terms of Service, LAND parcels 'are intangible digital assets that exist only by virtue of the ownership record maintained in the Ethereum network. All smart contracts are conducted and occur on the decentralized ledger within the Ethereum platform. The Curator has no control over and makes no

guarantees or promises with respect to the ownership record or smart contracts'.[4] The Curator is Metaverse Holdings Ltd., the company behind Decentraland, that provides platform users with the following 'Tools': the DCL (Decentraland) Client, the SDK (Software Development Kit) 5.0, the Marketplace, the Land Manager, the Command Line Interface, Agora, 'as well as any other features, tools and/or materials offered' by the Curator.[5] More technically, LAND is an ERC-721 token that associates 'each LANd parcel's x and y coordinates with a definition of a parcel's 3D scene that makes up the larger metaverse',[6] and LAND parcels 'exist only by virtue of the ownership record maintained on the Tools's supporting blockchain in the Ethereum network'.[7] Moreover, as 'any transfer of LAND parcel occurs within the supporting blockchain in the Ethereum network, and not within the Tools' Decentraland, a Virtual World on Open Standards, n.d.), the Tools mentioned above do not 'store, send, or receive LAND parcels' (Decentraland, a Virtual World on Open Standards, n.d.).

Metaverse Holdings Ltd. claims to not hold any ownership over Decentraland, as 'ownership is decentralized on the community', and the company's role is only to 'make available the Tools and the Site free of charge in order to allow different interactions with the Decentraland platform.[8] However, according to Article 12.1 of the Terms of Service, 'all title, ownership and Intellectual Property Rights in and to the Site and the Tools are owned exclusively by the Curator or its licensors', and the Curator's exclusive ownership shall include all elements of the Site and Tools, and all Intellectual Property Rights therein'.[9] These two statements, on the one hand that the company behind Decentraland does not own the decentralized virtual world, and on the other hand that it safeguards its intellectual property with respect to all the possible elements on the platform, including its architecture, are contradictory and

[4] Terms of Service, Article 10.6, (Decentraland, a Virtual World on Open Standards, n.d.). All terms of service cited in this chapter were in force in October 2019.

[5] (Decentraland, a Virtual World on Open Standards, n.d.), Terms of Service, Article 1.

[6] (Decentraland, a Virtual World on Open Standards, n.d.), Terms of Service, Article 5.2.

[7] (Decentraland, a Virtual World on Open Standards, n.d.), Terms of Service, Article 5.9.

[8] (Decentraland, a Virtual World on Open Standards, n.d.)Terms of Service, Article 1.

[9] (Decentraland, a Virtual World on Open Standards, n.d.) The elements of the site are further described in Article 12.1 as follows: 'The visual interfaces, graphics (including, without limitation, all art and drawings associated with Tools), design, systems, methods, information, computer code, software, 'look and feel', organization, compilation of the content, code, data, and all other elements of the Site and the Tools (collectively, the 'Curator Materials') are owned by the Curator, and are protected by copyright, trade dress, patent, and trademark laws, international conventions, other relevant intellectual property and proprietary rights, and applicable laws.'

add confusion to the perceived versus real set of rights that users ought to derive out of their transactions on Decentraland.[10]

In addition, the Content Policy is a 1279 word-long framework that details the rules applicable to content created by users who contribute to the development of the world. By definition, users cannot create LAND, as it is solely generated by the Curator, but they can, however, make additional content build on the LAND parcel.

The idea behind the (business) model of world-building is that, just as with the case of the Second Life game (Berger et al., 2016; Boellstorff, 2015; Gallego, Bueno, & Noyes, 2016; Locher, Jucker, & Berger, 2015; Malaby, 2011; Marshall, 2014; Partala, 2011; Shelton, 2010), users would increasingly take control of the world. In the case of Decentraland, this would occur not only through user-generated content, but also through the fact that this content is not created under the supervision of the Curator, but rather on the Ethereum blockchain, which entails that the Curator does not have any control over the validity of these transactions. The intention of the Curator is to give users a 'social experience with an economy driven by the existing layers of land ownership and content distribution', where 'developers will be able to create applications on top of Decentraland, distribute them to other users, and monetize them'.[11]

The development of the platform was created by the Curator in the image of human history: it began in 2015 with a so-called 'Stone Age', Decentraland was nothing more than a 2D grid of pixels running exclusively on web browsers that had metadata describing the properties as well as the owner of the pixels. After that came the 'Bronze Age', launched in 2017, and instead of pixel metadata it started storing the full content description (e.g. models and textures for given plots of land) in the blockchains themselves. The next steps have been the 'Iron Age' and the 'Silicon Age', which users are to experience on the Ethereum blockchain, allowing the virtual world to nurture a more sophisticated ecosystem of decentralized apps (Dapps) which in-game developers would be able build on Ethereum as well. At the moment of writing, the 'Iron Age' is still in beta version, and access to the world is based on an invitation system R/Decentraland—ETA on Iron Age?, n.d.), with the company hosting various events to stimulate developers to generate interesting content for the world.[12]

[10] Additional conflicts exist between the articles of the Terms of Service and mandatory European consumer protection, such as the unfairness of consumer arbitration clauses, like the one in Article 18.1: 'If the parties do not reach an agreed upon solution within a period of 30 days from the time informal dispute resolution under the Initial Dispute Resolution provision begins, then either party may initiate binding arbitration as the sole means to resolve claims, subject to the terms set forth below'. See (Engelmann, 2017). The same can be said for the limitation of liability included in e.g. Article 4 of the Terms of Service: 'You and the third party private key manager you select are entirely responsible for security related to access of the Tools. The Curator bears no responsibility for any breach of security or unauthorized access to your account'.

[11] Decentraland, 'White Paper' <https://decentraland.org/whitepaper.pdf>.

[12] See for instance the Game Jam that took place between 16 and 30 September 2019, a 'two-week online competition to create awesome interactive content that will form part of Decentraland' <https://gamejam.decentraland.org>.

4 LAND Under the Digital Content Directive

After understanding how Decentraland works, as well as going through the company's perceptions of its rights and obligations, time has come to assess some of the features of this virtual world by looking into the applicable law. As a virtual world claiming to engage in and facilitate the sale of virtual property, Decentraland poses a lot of fascinating questions which have at their core property and intellectual property laws. Who owns what in Decentraland? Can the platform claim not to own its own world, so that it can propagate the idea that the world is owned by its users? Is that claim accurate, namely can individuals or businesses even hold real rights in virtual assets? If the answer to this question is in the negative, what is the scope of the intellectual property rights held by the Curator, and how do they affect the rights users may exercise in the long run on the platform? How are these rights affected by the fact that the transactions generating them are based on the Ethereum blockchain? These are all questions that make Decentraland an interesting case study which ought to be given more academic attention. However, the main question this chapter endeavors to answer is: is LAND digital content in the meaning of the Digital Content Directive, and if so, what are the main features of the legal regime applicable to LAND from this perspective?

4.1 LAND as Digital Content?

The Digital Content Directive was adopted in May 2019 to enhance consumer cross-border purchases on the Digital Single Market and to safeguard a high level of consumer protection in the process (Hoekstra & Diker-Vanberg, 2019; Lehmann, 2016; Sein, 2017; Warburton, 2016). The scope of the Directive is laid down in Article 1 to include issues dealing with the conformity of digital content or digital services; remedies for the lack of conformity; and modifications occurring to digital content. The definitions used by the Directive are outlined in the following Article, which specifies that digital content is 'data which are produced and supplied in digital form' (Article 2(1)), and digital services are services 'that allow the consumer to create, process store or access data in digital form', or services that 'allow the sharing of or any other interaction with data in digital form uploaded or created by the consumer or other users of that service' (Article 2(2)). Illustrations regarding what may be considered as digital content are offered in Recital 19 of the Directive's Preamble, and include: 'computer programmes, applications, video files, audio files, music files, digital games, e-books or other e-publications, and also digital services which allow the creation of, processing of, accessing or storage of data in digital form, including software-as-a-service, such as video and audio sharing and other file hosting, word processing or games offered in the cloud computing

environment and social media'.[13] Just like Second Life, whose developers insist it is an open-ended world with no set objective (Kalning, 2007), Decentraland does not refer to itself as a game. However, there can be no doubt that Decentraland, as a virtual world, is based on digital content (Hoekstra & Diker-Vanberg, 2019; Lehmann, 2016; Sein, 2017; Warburton, 2016).[14]

Decentraland's sophisticated setup most likely combines digital content as output with digital services offered through its tools (Buchko, 2018), such as Agora, where the Curator hosts public consultations where users can vote on questions regarding whether parcel sizes should be increased or whether MANA inflation should be removed. Another example of a digital service offered by the Curator is the Builder, an interactive platform that users can employ to create content on their parcels, very much in the fashion of the Sims game series (Kayser, 2006; Lastowka & Hunter, 2004; Mistry, 2018). As a digital asset/token generated by the Curator, LAND most certainly fulfills the criteria described in the Directive's definitional scope, and can thus be considered as digital content to this end.

The Preamble to the Directive mentions that 'the legal nature of contracts for the supply of digital content or a digital service, and the question of whether such contracts constitute, for instance, a sales, service, rental or sui generis contract, should be left to national law' (Recital 12). In other words, understanding exactly how Decentraland functions in the eyes of the law is a matter which can only be thoroughly analyzed by looking at a particular jurisdiction. This is important to determine when and under which circumstances consumers enter into contracts with the Curator. Still, to the extent of establishing the applicability of the Digital Content Directive to transactions concluded between the Curator and users who act outside their craft, trade, business or profession, namely consumers, Decentraland certainly falls under the scope of the Directive.

4.2 What Are the Main Features of the Directive's Legal Regime Applicable to LAND?

This answer will be tackled from three perspectives: (1) the timeliness of the provision of digital content; (2) the conformity requirements; and (3) the modification of the digital content.

Regarding the timeliness of the provision of the contract, Article 5 of the Digital Content Directive states that '[u]nless the parties have agreed otherwise, the trader shall supply the digital content or digital service without undue delay after the

[13] See also Inge Graef, 'Blurring Boundaries of Consumer Welfare' in (Bakhoum, Gallego, Mackenrodt, & Surblytė-Namavičienė, 2018).

[14] In addition, there are considerable questions relating to private international law and the applicability of European consumer protection to international services. However, it is generally accepted that if providers of digital content or services target European consumers, they must abide by European consumer protection standards.

conclusion of the contract.' This is a highly relevant point for virtual projects which require an extensive time for development. As it has been shown above, Decentraland was launched in 2015, and has undergone significant changes ever since. As they become more sophisticated, these changes bring with them the uncertainty of when the world will be a finished product, or at least when it will reach a development stage where all LAND acquirers from the initial auctions will be able to exercise the rights attached to their purchase of this digital content, such as the transfer or further development of the plots of LAND. Threads on the Decentraland Reddit show that users report still not having access to the world, even years after purchasing LAND through the ICO R/Decentraland—ETA on Iron Age?, n.d.). A more specific illustration of delays which can appear in this industry is the virtual reality promise made by developers (Sergeenkov, 2019). If consumers create avatars, invest money in 'claiming names', or in other words spend real-life money to buy MANA and customize their avatars under the belief they will be able, at some point to use this avatar in virtual reality, yet the company is not ready to roll out its virtual reality platform, this can be an issue from the perspective of Article 5. Whether additional development time can be considered undue delay is uncertain. However, what is certain is that a lot of platforms, especially deploying technology which has not matured enough, may promise consumers products or services which they consider feasible to build, but may not accurately estimate the necessary time. In this case, consumers could end up investing real money in digital content which they would not have access to for a long time after the conclusion of the contract.

Moving on to conformity requirements, Article 6 of the Directive sets out a general obligation for the digital contract provided under the contract to be in conformity with the said contract. Articles 7–9 further explain how conformity is defined and applied to contracts for digital content. Article 7 specifies four cumulative conditions which ought to be met as subjective requirements for conformity: (a) that the digital content or service be of the description, quantity and quality, and possess the functionality, compatibility, interoperability and other features, as required by the contract; (b) that it be fit for the purposes required by the consumer and made known by the latter before or at the time of the conclusion of the contract, and which the trader agreed with; (c) be supplied with all accessories and instructions (including regarding installation and customer assistance) as agreed upon in the contract; and (d) be updated as agreed upon in the contract. In some cases, not all conditions may be applicable (e.g. (b)). Article 8 builds on these requirements to define the objective requirements for conformity. For example, Article 8(1)(a) refers to fitness for purpose through benchmarking, by referring to digital content or services of the same type; whereas Article 8(1)(d) speaks about compliance with potential trial versions or previews of the digital content or service. In addition, Article 9 covers integration issues arising under the trader's responsibility or due to faulty instructions given by the trader.

Taking the description as a central tenet of the hype around Decentraland, the company behind the project has gained a lot of traction and initial investment in the project due to its label of decentralization, which is supposed to be the core difference between Decentraland and other virtual worlds like Second Life or Eve Online.

However, while LAND ownership runs on blockchain and thus entails that each transaction needs to be validated on Ethereum and outside of the grasp of Decentraland developers, not the same can be said about a lot of the other elements on which Decentraland runs. For instance, as it was revealed in the Terms of Service, there is nothing decentralized about Metaverse Holdings Ltd. holding all the intellectual property rights for the architecture of Decentraland, including the tools it is being built with. The same goes for the storage of data, as all the data stored in relation to a parcel of LAND is currently stored on a centralized server (Schultz, 2019). This can lead to the very danger justifying the existence of Decentraland: that centralization is a risk for when virtual worlds shut down shop and leave their consumers without the fruits of their time, effort or financial resources spent in those worlds (Schultz, 2019). Under the current setup, Metaverse Holdings Ltd. has not hedged this risk, as without the infrastructure that it has clearly retained rights for, and currently operates centrally, there simply is no Decentraland.

Lastly, regarding the modification of the digital content or service, Article 19(1) specifies that such content may be modified under certain conditions: (a) if the contract allows and provides a valid reason for such a modification; (b) such a modification is made without additional cost to the consumer; (c) the consumer is informed in a clear and comprehensible manner about the modification; and (d) the consumer is informed reasonably in advance, of the modification as well as the right to terminate the contract, or the possibility to maintain the digital content or service without such a modification.

This is likely one of the crucial contributions of the Directive on Digital Content with respect to policing new business models which entail subsequent iterations and constant change. Decentraland set itself on a pathway of various historical 'ages' to map its transformation. Its earliest age consisted of a 2D map, similar to the Million Dollar Page The Million Dollar Homepage—Own a Piece of Internet History!, n.d.), where users were attributed pixels on the grid according to a proof of work algorithm Decentraland/Stoneage-Browser, n.d.). The subsequent ages marked fundamental changes not only in its 'touch and feel', or its functions, but more importantly in the business model used by the company, which aims to become an intermediary for peer-to-peer Dapps, exchanges, etc.

It is unclear if and how the company communicates with its consumers about these fundamental changes. Article 2 of its Terms of Service indicates that 'the Curator reserves the right, at its sole discretion, to modify or replace the Terms of Use at any time. The most current version of these Terms will be posted on our Site. You shall be responsible for reviewing and becoming familiar with any such modifications. Use of the Tools by you after any modification to the Terms constitutes your acceptance of the Terms of Use as modified'. Put differently, the Curator places the information duty for becoming aware of changes made in the Terms of Service on the customers, and does not acknowledge a need to disclose such changes. Should Decentraland fundamentally upon transitioning into the 'Silicon Age', Article 19(1) of the Digital Content Directive will become pivotal for the protection of consumer interests.

5 Conclusion

This chapter focused on closing a research gap regarding consumer protection and blockchain-based content and services targeted at consumers. It labeled how Decentraland uses non-fungible tokens such as LAND which may be considered as digital content, and looked into compliance issues arising out of the application of the Digital Content Directive to Decentraland in general, and LAND in particular.

Launched in 2008, the Bitcoin blockchain was the first distributed ledger technology to be officially called a cryptocurrency, namely a type of digital money sent via a series of computer-enabled actions based on sophisticated cryptographic protocols. With the rise of blockchain ecosystems like the Ethereum platform, which considers itself a virtual machine for Dapps, a lot of new meaning has been given to blockchain products. Both MANA and LAND, the tokes referred to in this chapter, are ERCs (Ethereum Request for Comments), namely 'technical documents used by smart contract developers at Ethereum', that 'define a set of rules required to implement tokens for the Ethereum ecosystem' (Agrawal, 2019). The fast pace at which these developments take place, and new meanings found for the tokenization system (Lee, 2019; Nadler & Guo, 2019; Savelyev, 2018) can be seen by merely looking at the standardization of known tokens, which can be divided into 'draft (opened for consideration, such as the ERC721 Non-fungible Token Standard), accepted (planned for immediate adoption), final (implemented, as the ERC20 Token Standard), and deferred (dismissed for now and may be considered in the future)' (de la Rocha, 2018). Non-fungible token standards such as those used for Cryptokitties or Decentraland are illustrations of the moniker 'Internet of Value', where it is not just cryptocurrencies that are traded online, but new forms of informational value.

However, this value can be stripped down to a more familiar concept, namely that of digital content. As data created by a platform and destined to be transacted to a user/consumer of that platform, parcels of LAND in Decentraland are nothing more than digital content, to which users may attach subjective forms of value, as well as objective financial expressions (e.g. when reselling). From this perspective, LAND parcels make up a fascinating case study for the application of the Digital Content Directive to a more sophisticated form of digital content.

After briefly examining some of the Directive's main tenets, namely the timeliness of the provision of digital content; the conformity requirements; and the modification of the digital content, it becomes increasingly clear that the Directive can play a central role in protecting consumer interests in the blockchain market, in more concrete situations not facing excessive legal uncertainty, as has been the case of, for instance, smart contracts, but in very specific transactions that are undoubtedly governed by European consumer protection rules. Absent market research to shed light on more factual details, such as how many European consumers have purchased LAND parcels, and out of those, how many are still waiting for their access to the Decentraland client, it remains to be seen whether there will be a practical need for consumer protection in these cases. However, it must be stressed that

the Directive on Digital Content amply covers problematic situations which may arise out of consumer contracts for digital content such as non-fungible tokens, and its application to such circumstances will mark a momentous opportunity to bring more legal certainty to the space of blockchain governance.

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