How Do Base Rules Constitute a Virtual World?

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Abstract
The classic theory of rules and norms rooted in John Searle’s theory of institutional facts makes it impossible to treat directives encoded in information and communication technologies (ICT) as rules. In the age of increasing dependence on ICTs, it is important to develop a proper ontological framework for discussing previously unknown issues. The aim of the paper is to characterize the rules constituted by the language of the code and show how they differ from purely social institutional rules. The analysis is based mostly on Jaap Hage’s theory of rules as constraints on possible worlds. Hage’s understanding makes it possible to explain how rules embedded in the code regulate the functioning of a non-intentional computer system. As a useful representation of relations between base rules and institutional rules, the author presents an example of virtual worlds of massive multiplayer online games, which are spaces that facilitate the emergence of complex, normative social orders. They are very illustrative when it comes to the distinction between digital and social dimensions, thus showing how human culture is able to flourish on top of the digital facts that function as observer-independent, physical brute facts. It is possible, because the base rules constrain the system that processes them, by which they constitute digital facts rather than directly guide users’ behavior. The analysis aims to provide tools for the future development of an appropriate legal framework to analyze the digital layer of reality.

Keywords Rules · Norms · Code · Infosphere · Massive multiplayer online games · Institutions

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1 Introduction

Claims about strict intertwinement of the ordinary life with information and communication technologies (ICTs) are already not controversial and no longer treated as a display of sci-fi inclinations of more hot-headed scholars. As Ihde and Malfouris pointed out in [21], humans do not just create technology but also stay in constant interaction with it. We not only act, but also think embodied and so technologies influence our actions, possessing affordances that shape our thinking, which makes them part of our mind. One of the examples is presented by Bergen and Verbeek, who in [4] study the case of Habitica—software that motivates the user to work on their habits through gamification. The goals set by the user are represented as fantasy monsters to defeat, and the user is portrayed as a hero avatar that fights them (also alongside friends) in exchange for experience and loot, similar to the systems adopted in role-playing games (RPGs).

Further immersion of humanity into the virtual was recently announced by Mark Zuckerberg, when he informed about the rebranding of Facebook to Meta, which signified the launch of the company’s work on creating the ‘metaverse’, allegedly a completely new way of interacting with others through the Web. Meta is not the only company that sees the future in the metaverse; it is accompanied by the other big tech giants, like Microsoft or Google. They all seem to have a similar aim, developing VR and AR technologies to make it easier and more pleasant to experience the world through technology [18].

The above should not be treated as another technological revolution, but rather as a consequence of the process begun with creation of the Internet. However, it does again prompt the question of relations between virtual and real, their mutual relationship and ontological construction. The question is more important than ever, because the development of the metaverse heralds even stronger impact of technology on our everyday lives. This will inevitably lead to emergence of various legal problems, not only most obvious ones, concerning intellectual property infringement, but also those connected with personal harm of the metaverse users. Needless to say that those problems would not be of new quality, unknown earlier. It seems, however, that there might be more of them in the future.

The most advertised features of the metaverse resemble those of the so-called virtual worlds. For now, I understand them as software designed to simulate a fictional reality while encouraging social interactions between thousands of players. The most notable example of such a virtual world are massive multiplayer online games (MMOGs). During their ‘golden age’, around 2010, they sparked a vivid interest in social sciences. Many of the scholars back then were so excited with the possibility of ‘inhabiting’ virtual spaces that they wrote about them as if they were indeed worlds distinct from the physical one. Although today it may be quite amusing to read the works that presented virtual worlds as realities independent of the physical one, they stated important questions about relations between physical and virtual. Like no other software, virtual worlds give the user a sense of being inside them. The projected metaverse also aims to provide an immersive experience of being somewhere else. It is then worth looking back
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to the discussion on virtual worlds, as they are able to create new environments for building social normative orders on top of them. Presenting a fiction of an alternative reality, they help us to clearly perceive how their communities build their own cultures within—including complex normative orders. Virtual worlds’ extraordinary potential for this aim was recently pointed out by Jason Grant Allen:

MMORPGs offer a rich and challenging context for working out the structure of systems of rules and pose some important questions about the formalisation of modes of action and deontic modes, as well as the interaction between rule sets that nest within each other [1, p. 20].

The legal concepts that we currently possess, however, seem to be unfitting the purpose of properly regulating relations mediated by the digital environment. In the paper I aim to present usefulness of Jaap Hage’s theory of rules as constraints on possible worlds in describing digital reality, which could help in working out the proper legal framework. First, I will briefly present the characteristics of virtual worlds and the shortcomings of the legal discussion on them. Then, I will try to establish philosophical basis for further discussion, comparing two approaches to building the ontology of virtual environments (and virtual worlds among them)—a post phenomenological one and the second one rooted in the theory of institutional facts by John Searle. After identifying the shortcomings of the second one in describing the digital realm, I propose the notion of base rules based on the theory of Jaap Hage. These are the rules imposed on the virtual world as an effect of running the software. As Hage’s theory does not treat rules as speech acts, lack of intentionality of the computer does not stand in a way of explaining how it is possible for it to generate a comprehensible virtual architecture. This shows that a wider application of Hage’s theory would lead to a better adjustment of existing legal notions to the new, digital contexts.

2 Virtual Worlds

From today’s perspective, addressing the problem of virtual worlds may seem irrelevant. Most of the literature on this topic was published between 2006 and 2009, when virtual worlds\(^1\) were at the peak of their popularity (the crowning example being World of Warcraft (“WoW”) [5], which had around 12 million subscribers at the peak of its popularity in 2010) [33]. Excitement with new forms of leisure in cyberspace, allowing users to play the role of fantasy or sci-fi heroes, was also reflected in the academic work of the time. The growing popularity of virtual worlds also initiated a series of publications in law journals that tried to solve potential legal difficulties that could arise or had actually arisen within their communities. Most of them focused on private law and their subject was, above all, the problem of the existence of virtual property.\(^2\)

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1 In most cases in the form of massive multiplayer online games (MMOGs).

2 Two articles that are fundamental for the debate are [16 25].
Above all, its popularity has greatly diminished. The fate of *World of Warcraft* ("WoW"), the most famous example of this genre, is a good illustration. 6 years ago, the last time Blizzard Entertainment published information about its subscription numbers, it was found to be almost half compared to 2010 [37]. Commenting on the existing literature on relations between the world of law and virtual worlds, Przemysław Pałka aptly points out that the optimistic predictions about the increasing role of virtual worlds made by some scholars turned out to be thoroughly wrong. More importantly, he identified a fundamental error made by the pioneers of legal research in virtual worlds. Namely, they tried to solve the normative problems related with ‘virtual property’ without first engaging in proper conceptual work [30, p. 104].

However, only because something is not popular and has not become a part of everyday life of people does not mean that it does not deserve a deeper reflection. Virtual worlds still possess qualities they possessed 15 years ago, as they are still platforms for vivid human interaction. They can provide us with even more data if we consider that most of the most popular MMOGs are almost 20 years old. Because of their persistence, they can be said to possess their own history, like *EVE Online*. The game in question was an arena of many political, economic, and military events that shaped *EVE* itself for future users. Groen [18] recorded the first years of virtual world history, describing people, interests, and geopolitics that eventually shaped the environment for everyone else in the game. The impact of clashes between player-driven organizations mattered for the experience of every user. An example could be a victory of an alliance called Band of Brothers over the Jericho Faction, which was at the same time the victory of aggressive, military gameplay over peaceful vision of the game founded on trade. The dominance of BoB in the following years defined the gameplay standards for everyone [18, p. 79].

The immersive power of virtual world creation enchanted some of the researchers from different areas of humanities: sociology, economy, law. Even despite this interest, the concept of a virtual world still does not have a universally accepted definition as of today. It is necessary to accurately map which digital environments have seen the emergence of complex normative orders on top of their base rules.

Edward Castronova understood the term virtual world very broadly (using the phrase ‘synthetic world’). According to him, a virtual world can be any virtual space that allows interaction between humans in a digitally created space. He presents a ‘taxonomy’ of virtual worlds that takes into account three dimensions: number of players in a virtual world, its genre, and the presence of an AI. He distinguishes three main types of virtual world that differ in terms of the levels of advancement of the dimensions mentioned above. First person shooters (FPSs) have small player populations, almost non-existent or simple AI, and their gameplay resolves around shooting for points. They leave little space for social interaction, as they last for the

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3 For example, Edward Castronova dedicated his book to describing a process of migration from real life to virtual worlds, as places that could offer an escape from crude reality [11].

4 Castronova uses the term AI used in the gaming context, namely the set of rules according to which the virtual world reacts on changes in itself introduced by the users or different elements of the virtual world.
duration of a single match that takes place on a small map that plays the role of an arena. Social worlds are persistent spaces designed to let people socialize in a digitally generated environment, which the community can creatively modify, e.g. through creation of new objects. Because they exist independently of users, they offer much more space for the evolution of complex social institutions. The third type of Castronova virtual worlds are MMORPGs that are persistent and enable constant interaction of large groups of players, just like social worlds. However, they have more content than virtual worlds: coded missions, complex AI patterns, background information on the history and lore of the virtual world. They contain vast territories to explore for the user who interacts with them through an avatar, the visual representation of the player through which they interact with virtual objects and other avatars. Continuous interactions between users lead to the creation of a virtual world economy and a specific culture, based on complex sets of institutions that emerge. Users are assigned with statutes connected with particular roles they have to play in a virtual society [12, pp. 103–125].

I adopt a narrower understanding of a virtual world, limiting it only to those environments that meet the conditions of an MMORPG virtual world, as defined by Castronova. Virtual worlds like MMOGs are created rather as spaces for the activities undertaken by the players and leave much space for creation of their own culture, not antecedently designed by the developer. Users constantly provide new content for the game, simultaneously developing it and negotiating its shape with the platform owners [38, pp. 145–150]. For this reason, activities undertaken within a virtual world are not necessarily games as such. The loose design of virtual worlds lets users decide how to utilize the tools provided. It depends on the intention of the people involved. This is why I adhere to the term user when mentioning those who participate in the functioning of a virtual world.

Boelstroff et al. [7] proposed four traits that, taken together, highlight the characteristics of virtual worlds. In principle, virtual worlds: (1) have to be spaces within virtual reality, with possibilities for exploration, filled with objects to interact with; (2) should afford exploration and interaction mediated by a visual representation of a user, who is a part of the world (an avatar); (3) should possess multi-user nature—every virtual world is a social space gathering thousands of users that enables them to engage in various social activities; (4) are persistent, which means that they exist even if some of the participants are logged off at any given time, which opens a possibility for the development of sophisticated institutional orders that shape the virtual world itself.

Before moving on, two caveats should be noted about the above list. First, virtual worlds are obviously not spaces in physical terms. They are graphical representations of spaces—which are observed by the user from an individual point of view—so that they can experience them as distinct spaces. Second, the persistence of virtual worlds is relative to the functioning of the servers they are hosted on. If a

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5 The ontological status of virtual objects will be described in section V. For now understanding them as the elements of virtual world that are perceived as separate and afford some kind of an individual interaction should suffice.
server becomes disconnected, the relevant virtual worlds cease to exist (even if only temporarily). Therefore, what ultimately is constitutive to virtual worlds is not their ontological status, which is no different from other programs, but rather the way users are meant to experience them: as if they were persistently existing spaces.

The last two of the above-mentioned traits of virtual worlds are decisive in terms of establishing their distinctiveness from other digital environments. Avatars allow highly immersive, embodied interactions with other users. This makes the experience more direct. The avatar begins to function as a part of the user’s identity. Due to the dominating social aspect, entering a designed fictional reality does not mean that actions of players are without real impact on their lives—the social reality of virtual worlds is "closely interwoven" with the reality outside [6, p. 7]. In other words, when entering a fictional space—a creation of the authors of the game—one is simultaneously situated in a social reality that can be hardly called fictional. The persistence of virtual worlds grant that actions taken inside them matter and their consequences are visible for a long time.

Such an experience is possible thanks to the specific rule design of virtual worlds. Only because coded rules are constructed in a certain way, virtual worlds can be distinguished from other digital environments. However, this most basic structure of virtual worlds has not been shown to be one of the factors that decides their worldliness. Before analyzing other aspects of virtual worlds, it is important to focus on the fundamental rules that constitute the framework for these social interactions. This paper aims to provide a reliable description of their character. From these interactions, new normative social orders emerge. They are the effects of the engagement of users in the life of a virtual world, improving the realness of the latter, being a natural result of its vivid social life. Therefore, proper rule design, together with higher-level social rules constituted on top of it, is one of the necessary conditions for the functioning of virtual worlds.

Even if virtual worlds are fundamentally constructed in the same way as other types of software, only they afford such a deep immersion in digital reality that comes not only from graphical representation and implementation of responsive, interactive environment. This immersion comes at most from their social dimensions, only amplified by the factors described above. They differ from other digital environments in that they allow for frequent and reinforced interaction due to the users being creators of their own content, and not only in simple, obvious way of creating new digital objects. The content they create is of social nature. During the first World of Warcraft Classic premiere in 2019, users formed lines waiting for their turn to kill the mobs, which is required for making progress in the game. The problem existed because thousands of people showed at once at the starting location of the game and had to complete exactly the same quests, requiring killing said mobs. As an effect, the mobs did respawn too slowly for everyone to kill them at once. Therefore, just like in MacCormick’s example [27, p. 14], an emergent social order—the line—was created, shaping the user experience.

6 ‘Mob’ is a short form for a ‘mobile object’ and is typically used in various MMOGs to designate hostile characters or monsters within a virtual world controlled by the computer.
The description of boundaries between virtual worlds and physical reality was traditionally based on the notion of a *magic circle*: an area within which the play takes place, isolated from outside influence. This area can be limited by physical signs (such as a fence or a wall), although what really separates it from the outside world is the intentional status given to it by the community. Ivan Mosca describes the magic circle as a *fiat* boundary, "constituted by the human interpretation and the social ontology" [27, p. 612].

However, many ethnographers noticed that there is no separation between the two areas. Both digital and physical worlds influence each other, pointing out that the boundaries between worlds are not impenetrable. T.L. Taylor described how work and play merge in the case of power gamers, who often engage in tedious and repetitive tasks to achieve complex goals within a virtual world [36, pp. 88–90]. Boelstroff presented a detailed description of how *Second Life* communities function both inside and outside the virtual world [6]. Castronova identified 3 ‘punctures in the membrane’: markets, politics, and law. When virtual items started to gain real-world value, they quickly became commodities, bought and sold with real currencies. The economic interests of parties involved in real money trading ("RMT"), as well as those of developers, who in most cases do not allow such practices, began to be potential sources of conflict [11, pp. 151–158].

The rich literature on the subject shows that following the path set by the magic circle analogy makes it impossible to fully understand the complexity of the relations between the virtual and real worlds. Assuming a single boundary between the two realities seems even more simplistic when it comes to analyzing relations between the different normative orders that regulate the actions of virtual worlds users. All actions of the users are subject to regulation by many discrete normative orders [1, pp. 7–8]. In many cases, they conflict with each other in ways that lack an easy resolution. These conflicts are best seen in the widely discussed area of so-called ‘virtual property’. The practice of RMT mentioned earlier is a good example of how official legal systems may be ineffective when applied to relations mediated by a virtual world. Most End-User License Agreements (“EULAs”) forbid transferring virtual items in exchange for real money. However, the market for virtual goods is still very common. After the economic breakdown in Venezuela, many families began earning for a living by killing green dragons in a classic MMORPG, *RuneScape*. Income that can be generated by selling items dropped by dragons may even reach $400 a month [28]. It is a widespread practice, even though *RuneScape’s* EULA also forbids RMT.

The example of *RuneScape* shows why virtual worlds have such a potential for the emergence of unique social orders. Developers could effectively enforce compliance with EULAs by changing the game code, making transfer of ‘virtual property’ impossible. However, in principle, they maintain the possibility for virtual items to be transferred between users through avatars, although it forces developers to seek individual cases of RMT, instead of fighting the phenomenon itself. They do so because without the means to transfer items, one of the most important social aspects of virtual worlds, the virtual economy created by the users would become impaired. Because of this, virtual worlds will retain the potential for the creation of discrete social orders. Otherwise, if developers were to limit the social aspects of
virtual worlds—not only the one mentioned above—this would inevitably lead to a decrease in popularity and a fall in profits for the company. To build a successful community, people need a large measure of freedom.

Interactions between users, as in the case of RMT, are regulated concurrently by different discrete orders, making it impossible to classify them as being taken ’inside’ or ’outside’ a virtual world. Leaving the magic circle analogy behind, I opt to treat all actions as real, because dividing them between ’virtual’ and ’real’ creates the illusion that some of them should not be treated as having an impact on the lives of users. Every action taken in the virtual world, such as the transfer of a virtual item, is not indifferent in guiding users’ behavior. In this context, applying the analogy of a magic circle seems to not correspond to reality.

Thus, when analyzing the landscape of various orders that regulate the virtual worlds, I leave behind the magic circle analogy. Exponential development of Floridi’s infosphere [17] (see Section 4 below) shows that in fact virtual worlds were maybe the first example of merging realities on such a great scale. They are not separate realities; they are extensions of our reality, mediating our interactions with others and thus forming them in particular way. Virtual worlds are very close to blended spaces described by David Benyon, namely, the spaces that merge physical reality with digital reality, such as VR googles or QR codes [3]. Both types of environments, blended spaces and virtual worlds, immerse the user and give them an impression of being present within them. Like no other ICTs, virtual worlds have the possibility of shape their users, thanks to embodiment through an avatar and immersive design. Ihde’s and Malfouris’ homo faber create virtual worlds in the same way they create them. According to Nick Yee [39], MMORPGs became a part of ordinary life for many users, being closer to ”second jobs” rather than places detached from reality. They shape them in ways they did not expect.

To acknowledge the above remarks in the normative sphere, it is better to replace an obsolete notion of the magic circle with that of a regulative environment created by Roger Brownsword. In his own words: ”the regulatory environment is one in which regulators seek to channel the conduct of their regulatees through various action-guiding signals” [10, p. 302]. In a certain regulative environment, rules can come from different regulators and solve various problems in conflicting ways. Particular users are, however, subjects to all of these rules at the same time, and it is up to them how they will react. Perceiving virtual worlds as regulative environments also broadens our perspective. Because we aim to identify all possible ways that regulators aim to guide behavior, we have to notice more than just those systems that guide the behavior of users through direct norms aimed to be executed by conscious agents: official law, EULA, or norms generated by a community. The base rules are placed at the most basic level, which has a much more direct impact on user behavior than the sources mentioned above. Within this layer are the rules belonging to

7 Joshua Fairfield also rejects dividing actions taken in virtual words between ’real’ and ’virtual’. He proposes to apply rule of consent to assess if normative orders external to virtual worlds should be applicable. One should primarily check if a person being a subject of certain behavior consented to its consequences (similarly as in sports). [15, pp. 830–832].
the virtual world’s code, which constitute its architecture (in Lessig’s terms, see [23], also later in section 6 of the paper) and regulate the possible actions that can be taken within the particular virtual world. The rest of the paper will show how it is possible to build complex institutional systems on top of the digital environments constituted by base rules.

It is not a coincidence that those were the virtual worlds that ignited visions about living in a digital reality, as they are constructed in such a way that seems to promise an escape from the reality into a maybe more fun, interesting, better world. Later work on the subject of relations between the real and the virtual showed, however, that there is no separation, rather a constant merging of two realities. It does not change the fact that the debate about virtual worlds motivated us to ask important questions about the character of relations between physical and digital reality. The next section presents how relations between ‘real’ world and virtual ones should be understood after acknowledgment of the infosphere shaping our lives.

3 Lawyers and Virtual Worlds

Fading of the boundaries between the digital and real is also an issue of traditional understanding of rules. As our world is being shaped by the digital technology, we are also bound to follow digital rules, however they are unlike any type of rules humanity encountered throughout history. In the field of private law theory, Pałka underlines that since Roman times, reality described by civil law has been divided into two layers, natural and legal. However, the methods we apply to describing certain objects in each of these frameworks are insufficient to properly render the status of digital objects to one of those layers. This is because those objects at the same time possess attributes of entities from both the natural and the legal realm [30, pp. 147–148]. For example, we can talk about a pen as a physical object, having its shape, mass, color, etc. Apart from that, we can talk about a pen as an object with a certain legal status—a property—subject to various legal actions. But what if the pen would be digital? The physical substrate of its existence is the hardware that processes it, thanks to the software that is an intellectual property of the developer. However, it is not the object itself, the digital pen, that is owned by the developer. Between the software and the effect of its execution by the computer, there exists an intermediary layer of the hardware. Applying legal concepts in the traditionally accepted meaning results in treating the digital pen as the sole property of the developer, who owns the software. It works until another subject of legal rights causes the hardware to generate changes in a virtual world, using provider’s software. The tension is probably best seen in the case of the avatars—digital representations of the users. If they—being digital objects as well—are also subject of IP rights of the developer, to what extent are they possible to be executed? Avatars in many cases serve as an alternative identity of the user, consistent with the way she wants to be perceived by others. Moreover, she can use the virtual image in other contexts than the virtual world itself. As the avatar was generated thanks to the software, should the user possess a specific license to use it outside of the virtual world? If so, would it not infringe her personal goods, including the right to build her positive
image? I claim that similar problems would be easier to solve if the law recognized the additional layer of reality, created by the base rules, to which I come back in the conclusion.

The lack of appropriate legal concepts to describe the rights of virtual worlds users could be seen mostly during the discussion about virtual property, which took place around two papers, namely [15, 24]. One of the aims of Dan Lastowka and Greg Hunter was to establish if digital objects should be subject to the property rights. They, however, assumed that virtual worlds should be treated as places distinct from our world, just without the material substrate. Users were assigned rights to virtual objects within the virtual worlds. The authors posed the question of whether these property rights should also be recognized in the ’real’ world. They answered the question positively, making analogies to immaterial rights, like usufruct, ignoring the fact that they confuse the digital object with the right itself. They treated virtual items as chattels, skipping many differences between the two. Needless to say, the authors completely ignored important ontological differences between the physical world and the virtual worlds, with the most important being that the software that a virtual world consists of is intellectual property of the service provider. They focused on how the objects functioned within the virtual world, not asking if they in fact possess the traits of real-world chattels.

Joshua Fairfield in [15] also argued for granting the users property rights to virtual objects, however he approached the problem from a different angle. He acknowledged that the virtual items are not existing in a parallel reality, but are a part of computer code. However, he argued that if some parts of the code resemble and function similarly to real-life places and objects, they should be granted protection by the property rights. He projected that virtual worlds would become the main way of experiencing the Web and so would become a universal, important part of social life. Granting the users proprietary rights to the digital objects would make it possible to protect them from the monopoly of the service providers. He, however, did not explain how it would be possible to grant proprietary rights to the code and what benefit would it exactly bring for the users.

In his thesis, Pałka criticized the above accounts and indicated that it is necessary to offer an appropriate conceptual framework to address the problem of virtual property. One of the most important results of his research for legal theory is the claim about the distinctiveness of the digital layer of reality, to which notions such as ‘property’ cannot be meaningfully applied and which should be recognized by law.

It is worth to note that Hunter, Lastowka, and Fairfield seem to had accurate intuitions on how virtual worlds are not like other kinds of software because of the social role they were playing and due to the active role of users in building them (that was signified in section 2 above). In fact, developers are not the sole authors of the content created in virtual worlds. Of course, without their substantial input, functioning of virtual worlds would be impossible. However, users constantly develop this work further, creating unique cultures on top of the given architecture.

The following two sections aim to present possible approaches to the virtual reality and its relations to the physical one in order to propose an ontology explaining how the users build on top of the software provided to them.
4 Action Based Approach to the Virtual

During last decades, it has been possible to distinguish two different approaches to describing the ontology of virtual worlds and their relation to physical reality. First of them, inspired mostly by Philip Brey [see esp. [8] and [9]], focused on static relations between different elements of virtual and real, is rooted in the theory of social facts. It was often used to describe the construction of so-called virtual worlds during the discussion approximately 15 years ago. The argument presented draws mainly from this approach, and thus it will be summarized in the following sections.

The second perspective, inspired most notably by the works of Don Ihde and Luciano Floridi, is rooted in post-phenomenology and focuses on an iterative process of interaction between human and technology rather than particular parts of the system. This approach seems to be more popular in recent years. Although it does not fit the purpose of creating a proper framework for a future legal debate, it signifies some important features of relations between virtual and real that should be underlined.

According to Floridi [17, pp. 40–41], modernity of the most developed societies is shaped by information and communication technologies (ICT) to such an extent that it fundamentally changes our perception of the world. Boundaries between 'real' and 'digital' are fading away, and what emerges is the infosphere, an environment shaped and organized by data. Our daily life depends on the constant processing of big data by the third-order ICTs,\(^8\) without us being aware of those processes. Massimo Durante draws on this conception to describe how we should describe the virtual [14]. He argues that although virtuality was always present in human culture, digitalization materialized it, creating new types of agents, the artificial ones. This shows, more than ever, that what is virtual is, in fact, matter of perspective—digital reality is virtual just for us. For digital agents—the digital is the only reality available.

Thus, according to Durante, ontological questions about virtual reality should not focus on 'what', but rather on 'what for'. It is futile to attempt to define the virtual, as it is, in fact, indistinguishable from the real. We should focus on how the digitalization changes our perspective on the world—as the ontological questions focus not just on what is material but on what is intelligible. Our epistemic limits also set the boundaries for ontology. Following this path, Durante points out that today, to exist means to be interactable. He distinguishes five constitutive elements of virtual reality: (1) agents; (2) modes of reality; (3) entities; (4) experience; (5) consequences. In [14] the author focuses on experience, distinguishing "three ways of experiencing reality by means of the virtual: (1) augmentation/enhancement; (2) re-engineering; (3) evaluation/judgment" [14, p. 323]. For the evaluation of the influence of the change on law, the first two are the most important.

The first way is to enhance our experience of reality, however, not qualitatively different from the experience already known to us. According to this approach,

\(^8\) [16, pp. 29–30] describes third order technologies as those which mediate between other technologies, without any human interference.
interacting through virtual worlds is the way in which we extend our experience of
digital spaces by offering "a three-dimensional, computer-generated environment
that can be explored and interacted with" that enables free "evolution and propaga-
tion" of virtual reproductions, leading to creation of "endogenously produced econo-
 mies and social orders" [14, p. 324]. It is this affordance of virtual worlds, that they
enable a creation of complex communities, that makes them so interesting for the
legal study. As the users build on top of the architecture provided by the developers,
they find themselves in new social situations that are distinctive to virtual worlds.

In such context, they start to experience the virtual worlds in the second way—
through re-engineering of some concepts. From the legal perspective, an example
of 'virtual intrusion,' given by Mark A. Lemley and Eugene Volokh, is especially
interesting as it touches the core of what is meant by being "present" [25, p. 1080].
If we would treat intrusion into private meeting as an example of hacking the soft-
ware, would it exhaust whole content of the wrongdoing’s unlawfulness? Changing
the meaning of 'presence' would not be limited to just a single case; it would have to
influence many cases and other spheres of social life.

Analyzing the merging of 'virtual' with 'physical' with focus on agent’s perspec-
tive and existence through affording interactions well reflects how we constantly
function in a reality constructed both from the digital and physical entities that we
relate to in various ways—sometimes qualitatively new. This approach rejects the
object-oriented ontology of virtual environments, taking an epistemic angle and
focusing on how different agents perceive reality available to them.

The presented position very accurately grasps the irremovable connection
between the virtual and non-virtual world. We reached the time where the digital
realm shapes our everyday life and the way we perceive the world. Durante points
to the important point that the digital objects do not belong to another reality, but
should be treated as part of the one reality we live in.

However, the approach described above does not seem to be applicable for legal
purposes. As the law operates on defining relations between objects, a theory that
can describe certain phenomena as static systems is needed. It is also currently
impossible to legally recognize the 'machine agents'. We should not confuse the abil-
ity to shape reality we live in with being a subject of legal rights.

5 Object Oriented Approach to the Virtual

In the following sections I aim to present how institutional theory of John Searle can
be adjusted to response for the challenges of legal description of virtual reality.

Searle develops his theory based on the fact that humans possess intentionality,
which is the ability of the mind to represent objects and states of affairs other than
itself.9 He distinguishes between brute facts and institutional facts. Brute facts exist
independently of human institutions, whether or not there is anyone to observe or
experience them. Institutional facts, on the other hand, exist only within a system

9 The following description will be based on [32].
of adequate constitutive rules that create human institutions. All constitutive rules have the form: "X counts as Y in the context C". In other words, the constitutive rule assigns a new function on the object if all necessary conditions of C are met. This happens not through physical alteration of an object, but through imposing a special status by collective acceptance by a group of people, thanks to their collective intentionality.

Searle’s theory is only applicable when we also accept external realism, which assumes that there is a reality beyond our own perception. Otherwise, the distinction between brute facts and institutional facts would be a nonsense, as there would be, in fact, no brute facts. What follows from this assumption is that there are brute facts which can be described as epistemically objective—whether they are true or false does not depend on those who perceive them, as well as them being observer-independent—their existence does not depend on their creation by people acting intentionally. On the contrary, institutional facts are social facts and are, therefore, observer-relative, as their existence depends on their creation by people acting intentionally. Interestingly, they are, similarly to brute facts, epistemically objective, and from the moment of their creation, their existence is independent from an individual observer. It happens that imposition of base rules leads to creation of environments that behave as if they were distinct realities, consisting of digital brute facts.

From the moment of the application of a constitutive rule, an object is recognized as something more than its mere physical features would indicate. Its status is assigned as long as there is sustained collective acceptance of its existence. Imposing a status through the use of the formula "X counts as Y in the context C" becomes a constitutive rule when the imposition of the status function becomes a matter of general policy. Next to constitutive rules that create the possibility of certain activities, Searle also introduces regulative rules that "regulate antecedently existing activities" [34, 35, p. 27].

One of the most notable distinctions presented by Searle, who developed the thought of [2, p. 56], was the one between the word-to-world direction of fit and the word-to-word direction of fit. This distinction applies both to speech acts and to intentional states. The word-to-world direction of fit characterizes those speech acts of intentional states, which are successful when they match the reality, in other words, they are true when they correspond to the actual state of affairs. The world-to-word direction of fit means that an illocutionary act is successful if the world changes accordingly [35, p. 10]. The distinction is especially important when talking about constitutive rules, which are examples of entities with the world-to-word direction of fit.

The most famous attempt to use Searle’s methodology to explain the mode of existence of virtual worlds was made by Philip Brey. He provides a scheme according to which virtual worlds can be experienced by the users as intended. He presents a notion of digital objects as symbolic representations of processes on the level of hardware.10 What makes them objects is the fact that "they are persistent, unified, stable structures with attributes and relations to other objects, and agents can

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10 The following description is based on [9, pp. 42–45].
interact with them" [9, p. 44]. Virtual objects are those of digital objects that are graphically represented in the second or third dimensions and can be interacted with through the use of a computer interface. Virtual objects are artifacts that exist physically as processes of the hardware, not only on the basis of mutual acceptance. What can be added to Brey’s claim is that digital objects (hence, also virtual objects) are created by the processing of the base rules by the system.

To be treated as objects, the symbolic representations described above have to be invested with specific status functions. This is done by applying constitutive rules. Without meeting this condition, even if there is a physical substrate to their existence, there could be no virtual objects, just fragments of code.

As Brey shows, virtual objects gain their virtual identity only through the acquisition of a status function. As Allen would put it, they require the addition of a status function onto a digital brute fact [1, p. 6]. There are two conditions for such recognition: first, acceptance of a constitutive rule for an entity, and second, recognition of an entity as satisfying the constitutive rule [8, p. 279]. One of the possible scenarios is that an individual with special authority proposes that a status be imposed on certain objects [8, pp. 281–282]. Such an individual is the developer, who can use base rules in order to create such architecture in the virtual world, and that functions of certain objects would also entail the status function ascribed to them by users (as in the apple example). Parallel to the methods used by the developer, new status functions can be ascribed through the emergent practice of the users themselves (for example, throwing away an apple can be considered a challenge to a duel by the community).

Imposing status functions on virtual objects is not arbitrary and is ultimately dependent only on the social practices of the community. Of course, designers of virtual worlds have a great influence on how particular objects will be perceived by the community. They use patterns from the physical and social reality known to the users in order to ensure that the digital environment will be functioning according to the initial plan. In other words, virtual objects have certain advantages that suggest to users their role in the virtual world. Those advantages guide the way the status function is imposed and influence the shape of the virtual culture created. Attributing virtual objects with affordances is possible, thanks to the constraining force of the base rules. By limiting the boundaries of the virtual world, constraints also create possibilities.

The above approach has one important flaw that makes it fail in describing virtual reality. It ascribes a normative character to rules that define software functioning. Normative sentences are prescriptions for conscious agents. Therefore, it is useless when it comes to describing rules that regulate the operation of a computer system.

Ivan Mosca points out the lack of intentionality in computers and claims that there are, in fact, no rules embedded in the code of digital games, nor in any program at all [29, pp. 629–630]. This is because he adopts the aforementioned, narrow understanding of a rule as a speech act with a normative character. If we agree on these presumptions, Mosca’s conclusion seems valid. He argues that "the electric exchanges into a computer, exactly like the movements of balls into an abacus, do not < < calculate > > anything, but rather we think of them as calculus" [29, p. 630]. At the same time, it seems misguided to assume that the
rules of an analogue game (like chess), applied by conscious agents, cease to be rules after being entered into a digital machine.

What we can learn from Mosca’s contribution is that the computer executes a set of rules that would surely be considered normative if the aim were to guide human behavior. These rules are clear, and it would theoretically be possible to apply them without the mediation of the computer, even if it entailed tenuous and extremely lengthy work. They are implemented in the system that executes all the calculations lying beneath the game mechanics, so that the players can focus on following the more general rules that are easier to predict. On this level, the fact that it is the system that weighs the outcomes of a certain action does not change that the conscious agent decides on what actions to take, knowing the rules that govern the system. Some of the rules of digital games have a normative character and are aimed at guiding the behavior of players (eg, following the pattern ‘if you want to gain more gold, you should kill more creatures’). However, the base rules do not only play the regulatory role in interactions between elements of virtual worlds. Some of them also influence the way the elements are displayed by attributing them different colours and shapes. Such rules cannot be translated into speech acts that could be obeyed by humans, but rather describe a given reality. Moreover, even if some of the base rules can be translated into speech acts, after they are encoded into the program, they cease to be speech acts. But does this mean that they are not rules as well?

Another problem with applying Searle’s theory to the digital world is the fact that it already assumes the existence of a physical world, the rules of which are independent of our intention. It allows the creation of new status functions on top of earlier status functions; however, it is impossible to create an architecture, which ongoing existence is independent from the sustained intention of the community. In case of the virtual worlds, however, such an architecture is being created. It can be changed through alterations of operations of its physical carrier; however, it is impossible to change it from within. Thus, a user who is acting within the virtual world in fact imposes status functions not on pre-existing institutional facts, but rather on another layer of brute facts, generated by the computer. Even if, according to Brey, we are able to make sense only from the objects generated by the hardware after we assign a status function to them, he does not explain how it is possible that, as an effect to imposing certain status functions by the developers, through the use of code, a meaningful reality is generated, yet independent of constant sustainment by the community.

Both of the problems with Searle’s theory in the digital context can be solved with a framework that would let us recognize both institutional rules created and followed by humans and digital rules, created by humans, but ‘followed’ by ICTs. The case is complicated when we acknowledge that base rules are processed by the hardware, while institutional rules are addressed to humans who are expected to follow them. Searle’s theory in its original form too strictly connects the notion of a rule with illocutionary acts and normativity.
6 Base Rule as Digital Constraints

Jaap Hage presented a theory that meets every prerequisite to be successful in describing how it is possible that we are able to impose human-created rules on a hardware. Taking the institutional theory of law as its starting point, he states two claims. First, that regulative rules are, in fact, constitutive rules and second, that rules themselves do not guide behavior [20, p. 15]. The second claim is especially promising when it comes to explaining why base rules, not addressed to an intentional subject, can still be called rules.

To better describe how rules impose themselves on the world, Hage elaborates on the concept of directions of fit. He designates the word-to-world direction of fit as the up direction of fit (where the world imposes itself on the language) and the world-to-word direction of fit as down (where the language imposes itself on the world). He further divides the down direction of fit into 3 categories. First, the causal down direction of fit aims to steer the addressee’s behavior directly (e.g. commands). The second type is the constitutive downward direction of fit that creates new facts in the world. And most importantly, the third type of the direction of fit, called the constraining down direction of fit, is an attribute of constraints on possible worlds. Rules impose themselves on the world through the third type of the down direction of fit, as they are in fact a type of constraint on possible worlds [21, p. 110].

Constraints are defined as entities that determine which states of affairs are compatible in a possible world, where a state of affairs is what is expressed by a declarative sentence (not necessarily a fact), and a possible world is a complete set of compatible states of affairs. Completeness of a possible world means that adding any state of affairs to a possible world would violate a constraint on that world. Therefore, a set of possible states of affairs is defined only by the constraints—in a world without constraints, literally anything is possible, even states of affairs that are logically contradictory (as rules of logic also constitute certain constraints). The role that constraints play in defining possible worlds implies that they make some of the states of affairs impossible or necessary; otherwise, they would not serve their purpose. Thus, the compatibility of states of affairs is assessed only on the basis of constraints imposed on a possible world [20, pp. 22–24]. These are constraints that determine the sets of facts that can go together [21, p. 111].

There are two types of constraints: hard and soft. The first category is those that are independent of human decisions, while the second category is those that are dependent on human decisions. Rules, as entities that can be created, derogated, or modified by human activity, belong to the second category [20, pp. 25–26].

As constraints, rules impose themselves on the world by creating a new set of compatible states of affairs. In this way, rules have the ability to create facts (their existence determines the truth value of some states of affairs in a possible world). There are three types of rules:

Dynamic rules create new facts or modify or take away existing facts as a consequence of an event. (...) Fact-to-fact rules attach a fact to a presence of some other fact. (...) Fact-to-fact rules are different from dynamic rules because the
relation between the connected facts does not involve the lapse of time. (…)
Counts as-rules have the following structure: Individuals of type 1 count as
individuals of type 2 [20, pp. 16–17].

In Searle’s theory, only counts as rules could be called constitutive, as they corre-
spond with the frame: "X counts as Y in the context C". In Hage’s proposition, the
two other types mentioned above are also constitutive, because they constitute new
facts, even if they are not necessarily status functions.

From the subject’s perspective, what is important is that rules do not necessarily
have a normative character (as in Searle’s original theory). Norms are only those
rules that constitute deontic facts. It is possible to highlight two aspects of a norm,
rule aspect and normative aspect, where the first one is a constitutive rule itself and
the second one, a deontic fact that the norm constitutes [20 p. 15]. However, deontic
facts are only those that involve the existence of duties or obligations. What follows
then is that only ought-to-do norms should be in fact considered norms [21, p. 123].

Deontic facts are attached to other facts in the world according to the rule as long
as the rule is valid. They exist as a factual counterpart of the rule, described by sen-
tences in the form of open generalizations (for example, “thieves are punishable”).
The formulation of such sentences, in general, is the same as that of the rules them-

With such a narrow concept of a norm, some rules that are commonly called
norms are left out of this set. However, this does not mean that they have lost their
importance. Those that do not create deontic facts—like counts as rules that create a
new status for certain objects—still have a very important role in a complex system.
In many cases, facts created by nonnormative rules are the facts to which norms
attach deontic consequences [21, p. 136]. A good example is a situation in which
a virtual world’s user joins a user-driven organization and is granted a new status
that has to be recognized by other users. It gives them new rights that other mem-
bers of the organization have to respect (such as the right to take resources from the
common pool). They also have new obligations (like the obligation to protect other
members of the organization).

It is impossible to count base rules as laws of nature that are independent of
human will and unbreakable. They are purposefully created and can be freely modi-
fied according to the creator’s will. On the other hand, when set, it is impossible to
disobey them without direct interference with the code. Institutional theory divides
the world into two categories of facts: brute facts, from the domain of nature, and
social facts, fully dependent on collective intentionality. However, facts that take
place within virtual reality do not fully fit the description of both types described
above. Considering the emergence of the Internet and difficulties in applying already
existing concepts to its functioning, it is necessary to distinguish a new layer of real-
ity, the digital one. Taken together, as a system, base rules constitute what Lawrence

\[\text{11 For a detailed description of different kinds of facts and how rule-created facts are created, see: [19,}
\text{ pp. 118–123].}\]
Lessig calls *architecture*, the structure of a world. Architecture delineates what is physically possible and what is not physically possible. Architecture in the real world is shaped by the unchangeable laws of nature [26, p. 663]. Digital spaces constituted by base rules have modifiable architecture—sets of possible and impossible states of affairs can be changed by modifications of the code. Virtual worlds are one of those architectures that has the ambition to imitate an alternative living reality.

What defines base rules is that they are digital—they operate on an environment constructed from pieces of information by a machine lacking intentionality. Thus, they fit neither of the two categories of rules were thought to be exhaustive categories of the rule set, i.e., natural rules that constitute brute facts and institutional rules that constitute social facts. Instead, base rules possess some traits of both. Like institutional rules, they can be changed, although they are unbreakable by those whose actions they regulate.

Institutional theory in its traditional understanding cannot explain how it is possible that the base rules can provide the representation and simulation of a virtual world. Rules are independent of their linguistic formulations and are capable of constituting new facts. The theory understands rules as speech acts, a form of statement, thus linguistic in nature. It is insufficient if we aim to comprehend how base rules can lead to the generation of a virtual environment, as speech acts are unable to control ICT processes. This is why Hage’s theory of rules as constraints, in which rules are something distinct from the formulations that constitute them, is so useful in explaining how the existence of base rules is possible. Hage’s account is an example of what Allen calls an ‘ontological turn’ in legal theory, using a term analogous to the one used in anthropology [1, p. 6].

It is worth highlighting once again that virtual worlds are a specific type of software. From the perspective of the rules-as-constraints approach, all coded commands that are executed by the computer are rules, including those that concern the mere aesthetics of the objects within the virtual world. All the coded commands are instructions that constrain the system to present every aspect of a virtual world. Through the implementation of these instructions, a computer system is limited to generating the expected representation of the world, mutual relations between the objects within, physical representations of the players, and the scope of possible actions they can undertake.

Hage’s theory, although created with only brute and social facts in mind, succeeds in explaining how it is possible that traditional prescriptions can be ‘translated’ into the form of electronic commands, thus becoming base rules. It is possible thanks to the separation of rules from their expressions and observing their ability to constitute new facts in the possible world (in this case, a digital fragment of reality). Even more importantly, it permits the description of different types of rules that regulate the situation of a virtual world user.

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12 Lessig gives an example of a dispute concerning changing the characteristics of flower petals and dogs in *Second Life* [22, pp. 10–15].
What is striking about the digital constraints that base rules are is their peculiar status if we attempt to classify them according to the division on soft and hard constraints. In essence, they are soft constraints, they are imposed on a virtual world by a willful decision and can be modified or derogated at any time. In Hage’s terms, they are limited in space and time and dependent on human will (contingent necessities). However, unlike social rules, they function as if they were hard rules when regulating actions taken within the system. To be precise, the base rules themselves do not regulate anything. They constitute facts of the virtual world that tell us what is necessary and what is impossible. The base rules are addressed to the ICT that generates the virtual world. It would be wrong to claim that base rules directly regulate the actions of virtual-world users. The users learn the mechanics of a virtual world not through the code but through practice, by reading guides or tutorials, as they learn how the physical world works.

Users cannot influence the base rules without interference with the code. This explains why Lessig could successfully apply the notion of architecture to the digital realm. Unlike social rules, base rules cannot be disobeyed. Moreover, although they are dependent on human intentionality and are institutional in nature, when set, they have an effect on the system as long as it is maintained. Their ongoing existence depends not on the group intentionality but rather on the operation of a system into which they have been coded. As mentioned earlier, base rules are, in essence, soft rules, according to Hage. One could say that if they can be changed, they cannot be treated as rules of nature, because they are like any other type of institutional rule, just more difficult to change. However, such an argument omits the fact that base rules are imposed not on humans but on the system that generates the virtual world. In this case, unlike with social rules, the addressee of the base rules is unable to change them if not directly allowed to do so. When a user hacks the system and changes the base rules, they change the game world, but not through the change of rules that are imposed on them. ICTs follow the rules blindly, executing a programmed set of commands. The concrete changes should be properly introduced in the program, otherwise it will be blindly executed as long as the machine is active. It is so dissimilar from how humans act that it was exploited in science-fiction stories, like Stanisław Lem’s Terminus from the collection Stories of Pirx the Pilot.

The independence of facts constituted by base rules from designers and users’ intentionality is well depicted by occurrences of unplanned errors in processing the base rules. In certain situations, the digital facts do not look exactly as the designers planned. Sometimes, virtual world graphics glitch, for example, giving a virtual object an eerie shape or color. Sometimes, game mechanics make it possible to break the internal balance of the world. One of the most famous examples of an unintended catastrophe in virtual worlds was the ‘Corrupted Blood Incident’ in World of Warcraft, which can be called a virtual pandemic. Due to the glitch in the game code, avatars started transferring deadly corrupted blood status between each other, effectively leading to massive deaths of avatars in every corner of the virtual world. The incident, due to its unpredictability, served as a case study for epidemiologists [31]. Such unintentional effects are, however, also results of intentional application of the base rules, regardless of the fact that they show that digital reality may act independently from the group intentionality.
As should be already clear, the user community has to ascribe status function to the facts constituted by the base rules if the latter serves their function. As an effect, the most fundamental rules of the virtual world are both included in separate, but strictly connected sets: digital and institutional. Due to this connection, the base rules can also be modified as an effect of community pressure. Even if in most cases it is the developer who is responsible for modifications in the base rule set, it is possible that users participate in shaping the reality of a virtual world. For instance, Melissa de Zwart and Sal Humphreys analyze the role EVE Online’s Council of Stellar Management ("CSM") plays in shaping the virtual world. CSM is an advisory body for the developer, CCP Games, and its members are elected from the users of EVE Online.\textsuperscript{13} It is also possible that the creator of a virtual world gives its users a wide scope of freedom in modification of the base rules set. This is the case with an aged, but still existing multi-user dungeon ("MUD"), LambdaMOO, in which users can file petitions to introduce socio-technical changes in the game. Petitions are then revised and voted on in a special procedure, where the administrators of the world, called wizards, have only limited rights to veto a petition [28, pp. 252–255]. It is a good example for how base rules are interwoven with institutional rules: the change is introduced willfully, however, after that new rules are processed absolutely, through deterministic algorithms in the system.

As a result, the actual shape of the base rules ultimately depends on an interplay between the interests of the community and the developers. Unlike the hard constraints of a real world (like the laws of nature), base rules come through multiple, ongoing transformations dependent on decisions made outside of the virtual world. However, they come through changes and are subject to so much discussion precisely because inside the virtual world they act as hard constraints and define the exact experience the users will have from participating in a virtual world. Assigning of status functions to particular parts of virtual reality explains why users are so interested in changes in the base rules, which limit all of the possibilities in a virtual world.

7 Conclusions

Throughout most of history, the discussion about rules resolved around guiding the behavior of conscious, intentional agents. Fast development of ICTs in recent time showed that it is possible to translate rules in the form of code addressed to non-intentional, nonconscious technologies, which are able to execute them according to the intended plan of the designer. This became a challenge for the institutional theory of rules and norms that was unable to fully explain how it is possible.

Hage’s theory of rules as constraints provides tools to properly name and describe what the process of execution of base rules really looks like. If we detach rules from their formulations and treat them as ontological entities,

\textsuperscript{13} Although its impact on creation of base rules is hard to assess. For a detailed and critical description of the CSM functioning and role it plays in EVE Online, see [13].
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constraints, we are able to understand how it is possible for the meaningful creation of virtual worlds. Translating the directives into the code leads to expression of the rules in a way comprehensible for the system. The rules themselves are the effect of processes initiated by their expression in the code. They constrain the system that generates a virtual world according to the commands. As a result, users build their institutional orders on top of the digital facts constituted by the constraints. They adhere statuses to these facts, which are similar to the laws of nature, because they are impossible to change from the level of the users, who can only form purely social, institutional reality on top of them.

On top of the facts constituted by base rules, the community is able to constitute various institutional facts as an effect of the proper design of a virtual world, or through emergent social cultures. This results in a meaningful experience for users. Institutional rules remain strictly interwoven with base rules, as the perception of particular virtual objects and how they act depends for the most part on the role they play in the functioning of a virtual world.

Applying Hage’s theory to digital environments helps to solve the problems connected with lack of legal terminology signaled in Section 3. Emergence of the virtual worlds is directly possible thanks to the base rules that are being executed by the hardware on which virtual world should be simulated. This simulation, while being an effect of developer’s coding, functions independently of their intention. The users further enrich virtual worlds thanks to the architecture, without any need of prior acceptance by the developers. This additional layer, put between two systems of institutional rules, the digital layer, explains how users can develop a virtual world on their own. It helps to explain how it is possible for the user to create her own image through the avatar that is formally the part of the code created by the developer.

The relation between base and institutional rules described above applies to any digital environment created for the purposes of interaction of groups of people. However, the similarity of base rules to laws of nature is easier to see in the case of virtual worlds. They allow us to observe this relation in fine detail. We see the effects of system operation according to the base rules through graphical and interactive representations of the virtual world, with which users can interact as if they were physical entities.

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Declarations

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