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Article

Virtuality and Reality—Toward a Representation Ontology

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Abstract: Based on a brief overview of the history of ontology and on some philosophical problems of virtual reality, a new approach to virtuality is proposed. To characterize the representational (information, cognitive, cultural, communication) technologies in the Internet age, I suggest that Aristotle's dualistic ontological system (which distinguishes between actual and potential being) be complemented with a third form of being: virtuality. In the virtual form of being actuality and potentiality are inseparably intertwined. Virtuality is potentiality considered together with its actualization. In this view, virtuality is reality with a measure, a reality which has no absolute character, but which has a relative nature. This situation can remind us the emergence of probability in the 17th century: then the concept of certainty, now the concept of reality is reconsidered and relativized. Currently, in the descriptions of the world created by representational technologies, there are two coherent worldviews with different ontologies: the world is inhabited by (absolute) actual and (absolute) potential beings—or all the beings in the world are virtual.

Keywords: actuality and potentiality; virtuality; openness; history of ontology; virtual reality; presence; worldliness; representation technologies; information; Aristotle

1. Introduction

I propose that we conceive of technology as a specific form or aspect of human agency, the realization of the human control over a technological situation. In consequence of the deployment of this human agency, the course and the outcome of the situation are no longer governed by natural constraints but by specific human goals. The human control of technological situations yields artificial beings as outcomes. Since technological situations vary and they are not homogeneous in nature, they

can be identified on the basis of their constituents. The components that make up a technological situation are a set of (natural or artificial) beings, humans (or human agencies), their aims, and (situation-bound) tools. In Hegel's words, the essence of technology necessarily appears in concrete, particular technologies only, while on the other hand, all technologies necessarily embody the essence of technology.

According to this view, every element of the human world is created with the help of technologies. Both human nature and social being are the products of our technological activity, and their characteristics are determined by the specificities of the technologies we use to produce them. All historical forms of human life and of social being are constructed (and continuously re-constructed) or produced (and continuously re-produced) by historical versions of technology.

In comparison with widely accepted views on technology, this view implies an extremely general and abstract conceptualization of technological praxis. In particular, all human praxis appears as technological, or better said, as having a technological aspect or dimension. The view on technology proposed above is therefore really close to a philosophy or theory of human actions. Human practice consists of the—imperfect—realization of human control over a situation. Human practice is of course not identical with technological praxis, as the former has several other aspects as well, but it always and necessarily has a technological aspect too. Moreover, every human situation can be regarded as a technological situation, every human being as a technological agent, every human goal as accomplishable by a specific technology, and every human tool as a situation-bound technological tool. The technological aspect of human practice is a response to human vulnerability and expresses the intention to gain control over the situations of our lives. Without such an evidently partial success, we would cease to be human beings; we would take part in natural situations as natural—animal—beings. For this reason, every technology is a technology of humanity: the human beings, the human world, cultures and societies are all products of technologies. Further, technology is the only way humans can create themselves. Technology was born together with human beings. Various branches of technology can be associated with various types of life situations. Our self-creating praxis is facilitated by a range of economic, legal, psychic, social, cultural, material, mechanical, *etc.* technologies.

Technology has an ontological Janus face: it produces both "things" and "representations". For thousands of years, people used material (agricultural or industrial) technologies where the material product was in the foreground, although symbolic contents were also included into the product.

The last few decades have witnessed a significant technological change, in that "representations" have became dominant over the "thingly" products in the most important technologies of our age. On the one hand, new representation (cognitive, communication, cultural, and information) technologies have emerged; on the other hand, the representational or symbolic function of traditional technologies has become more significant. The new terms postindustrial, knowledge, risk, information, or network society all refer to a type of society where representational technologies are the dominant factor of reproduction of human life.

Taking into account that the most fundamental ontological entities, for instance, reality, levels and forms of being, *etc.* [1] are constructed or (because of the social embeddedness of relevant technologies) socially constructed [2], the shift from material technologies to representational technologies has important consequences for our ontological views. The significance of virtuality has been emerged in this context.

The term "virtuality" is relatively new (on its emergence see e.g., [3] and several papers in [4], e.g., [5–10], but an overview of the history of philosophy reveals that the fundamental problems of virtuality have been extensively discussed, however, under the title of problems of ontology [11]. Additionally, in the last few decades, psychological and philosophical analyses on virtual reality contribute to the better understanding of these ontological problems in a very effective way [4,12–15], Studies in these two fields (history of philosophy, and the philosophy of virtual reality) provide the background for us to suggest a new conceptualization of virtuality, a view which is sensible enough to take into account the new developments of human technologies.

2. Reality and Virtuality in the History of Philosophy

It can be stated without any doubt that one of the main themes of philosophical thinking has been the identification and characterization of reality. The nature and the borders of reality, a valid demarcation between the real and the non-real (apparent, imaginary, irreal, fake, non-existing, meaningless, *etc.*) as the fundamental questions of ontology have been the permanent sources of ideological and philosophical debates. The specificities of virtuality and virtual beings can be originated from this intellectual context. The fundamental problem is the right characterization of those aspects or forms of reality, which can be identified nowadays as the former characterization of virtuality or virtual beings in the history of ontology.

In search for the characteristics of reality, we can follow a social constructivist approach, so we could say that we shall try to contribute with some ideas to the social construction of virtuality.

However, because of the changing human technologies, in this construction process, there have been two essential historical and ideological turning points at the emergence and at the decline of modernity, so we can speak about premodern, modern and postmodern reality.

2.1. Premodern Reality and Virtuality

The premodern period had many, although slightly different, ideas concerning the reality problem. The *magic reality* was constructed by will; in this way, the mere construction of interrelations between the observed phenomena or between the experienced situations had an absolute primacy, without making any distinctions between different kinds of interrelations (these distinctions appeared later on, in the mythical world views). In the magic views, the possibility and the actuality of a relationship are coextensive with each other; they are indistinguishable aspects of the world. In other words, the magic reality can be considered as a continuum. In our proposed view, this kind of reality can be called virtuality, so virtuality is a fundamental feature of the magic world view.

When philosophy emerged from the mythological world view, the early distinctions in the evaluation of the relationships of experienced situations had a more fundamental significance. In addition to this development, the structure of human experiences, the composition of beings, the complicated functioning of cognition, the levels and hierarchy of existing entities were studied and disclosed by the first philosophers. This progress produced the ideas of the plural world (inhabited by essentially different beings, which may even exist at different levels of the Being) or a plurality of worlds (each of which is inhabited by fundamentally different beings). The different kinds of modes of existence have become a topic of intellectual debates. In this context, some definite differences between the different

kinds (or levels) of reality can be established and treated. The fundamental question is: how can we identify and reach the parts of our experience or knowledge, which are unquestionable, which are real in full, which yield to doubtless certainty. These parts of knowledge refer to the inner core of reality, which is surrounded by less valuable spheres of reality. These outer spheres seem also to be a part of reality for the people who are not learned enough or who are not critical enough in their observations and/or thinking. For a philosopher, their full reality is only appearance, which can be destroyed by careful observations or the right arguments. The sphere of reality of which the full reality is proved to be ephemeral in the light of the philosophical investigation is the sphere what we call now of virtuality. The *ancient reality* should be an eternal reality; whereas the "ancient virtuality" is the kind of reality that is able to lose its full reality.

Already in the early ancient Greek philosophy, two main traditions were formed to investigate the phenomena of our life, to criticize them, to produce certainty and to approach the real in full. These are the traditions of the ancient "materialism" and that of the Parmenidean one. According to the "materialist" tradition, reality can be based on the testimony of our perception. In this tradition, the main problem is the right coordination and evaluation of the different sensual experiences. In ancient literature, there are many interesting argumentations and debates around this problem, e.g., in the works of Heraclitus, Aristotle, or Theoprastus. As Paul Feyerabend emphasized, a radical turn happened in the human culture with Parmenides, who rejected the testimony of senses in the question of reality and proposed the use of right (and contradiction-free) thinking as a judge in this respect. Because of the perceptual illusions and the ephemeral feature of any perception, Parmenides declared all the sensual experiences to be appearances. Since that time, there has been a dual tendency in Western culture: reality can be constructed following the tradition of compared sensual experiences or the tradition of right thinking. These traditions yield to different kinds of realities and virtualities.

Plato's two worlds (the imperfect sensual world and the perfect world of ideal Forms) represent the spheres of virtuality and reality in a very clear form. The sensual world is a realm of change and impermanence. It is a complete world; however, it has a lower value compared to the true, fully real world of Forms. The world-forming Platonic virtuality is an ephemeral and contingent reality that is an imperfect copy of the true reality. In this world, knowledge has a strict limitation. If we are restricted to use our experiences, we can only form different opinions about the sphere of virtuality, and it is impossible to reach the absolute truth here.

Aristotle's main contribution to the problem was perhaps his teaching about the clear distinction between the two levels of Being, namely between the actuality and the potentiality. The actual being is a being in full, and the potential being lacks fullness, so they are good candidates for the Aristotelian reality and virtuality. However, according to the Aristotelian thinking, both the actual and the potential being are due to every entity, which means that reality and virtuality are distributed among the beings of our world instead of their concentration into completely separate worlds. In this way, the Aristotelian virtuality is an individual property of entities. On the other hand, Aristotle described and analyzed the transformation of potentiality to actuality and *vice versa*, and he interpreted the concept of motion in this way. This means that both the Aristotelian reality and virtuality have a dynamism; they can transform into each other, so the Aristotelian virtuality has a changing nature.

There is not enough room here to discuss the contributions of the different ancient Greek and Medieval philosophical traditions to this problem in more detail (see e.g., [11]), but, in summary, we

could say that the typical premodern ontology depicted a plural world or the plurality of worlds. In both cases, reality is a structured construction, and its constituents have different grades or measures of certainty, perfectness, contingency, permanence, value, *etc.* A constituent, a part, or a version of reality, which has no maximal measure in socially given reality-determining factors, or which is able to loose its maximal value can be considered later on as virtuality. "Premodern virtuality" is a kind of reality, it can be an uncertain, or an imperfect, or a contingent, or a changeable reality. The premodern reality is an open reality; it is open for constructing many possible worlds by virtualizing different components of reality.

2.2. Modern Reality and Virtuality

The emergence of modern ideology and world view created a radically new context for ontological thinking. This is the age of the formation of the modern individual, the autonomous personality. Because of the historical conditions of this process, the fundamental aspiration of the modern individual was to gain the ruler position over his world [16]. The medieval God-world relation has been reproduced in many individual forms. However, the modern individual wanted to wield a real, unquestionable, certain, effectively functioning power, that is, he/she wanted to rule over a full reality. As a result of these developments, the basic structural elements of the power situation have been considered as reality in full, such as the individual, his/her power, and the object of this power (nature, the other individual, property, *etc.*). For the other constituents or aspects of the collection of beings, a lower reality-measure was allocated, they constituted the sphere (which later on named of virtuality) around "the secret object of desire".

During the development of modernity, the distinction between the objective and the subjective reality became possible and significant. The distinction between these possibilities *i.e.*, the declaration as full reality of the "external" or the "internal" world of the perceptive human beings lead to the second fundamental schism in the ontological tradition (similarly to the emergence of the Parmenidean tradition in the ancient time). These controversial tendencies created the formation of modern materialism and subjective idealism, which are two different positions in many respects. However, the most important feature for our current analysis is the fact that in these traditions the active, determinant elements of the power structure are different. In the materialist tradition, the "external" world, the nature, the society, the body, the objects of our power are the active agents of the situation, while in the subjective idealist tradition—the "internal" world—the individual abilities (perception, intentionality, thinking, will, *etc.*), play the determinant role. However, the intermediate element in the structure of modern power, the acting power, is common in both traditions.

Summarizing the main ideas about the modern reality, it can be stated that in the modern era we can find only one full reality, which is either "external" or "internal" world—they are the realms of the objective and the subjective reality. The virtual possible worlds were transformed into the inside of personality and became an important source for its individual and plural character. Earlier, we mentioned the perfectness, the certainty, *etc.* as the determinant characteristics of reality compared to the virtuality, now we would like to add the power, the active, creative force as a feature of reality to this list. Modern reality is able to create and control itself and to develop its structure in a self-organizing process. In this respect, "modern virtuality" is a reality which is created, which has no absolute power,

or which was able to loose it and which is forced to suffer from the use of power. Modern reality and virtuality form closed, individualized worlds together in order to ensure an absolutely controllable environment for the individual beings.

2.3. Postmodern Reality and Virtuality

Postmodern ideology is a critical reflection of the failure of the modernist ambitions, first of all, in respect of power. It became transparent that the realization of the modernist power and the effective control over the individualized worlds have unavoidable disadvantages and intransgessable bounds. In this situation, postmodern thinkers have described two strategies for the present-day ideology. According to some people, the deliberation from any ruler ambitions would be an acceptable exit from the modern crisis, but, for many others, the presentation of that kind of behavior would be the solution in which the successful operation of the modernist project is demonstrated. They are the strategy to disregard the power and the strategy to disregard the bounds. Concerning their difference from the modernist view, both alternatives represent the same, in their images of reality and virtuality.

The fundamental postmodern ideal is a so-called decentered ontology, in which the boundary between reality and virtuality is destroyed. There is not one reality or there is no reality at all, we can only speak about hyperreality [17,18]. In the world of hyperreality, the distinction between real and unreal is blurred. In this world, the images and signs, the simulations and simulacra have no referents, they can only be considered as real beings. In this situation (which is approaching the last stage of a cultural crisis), the image masks the absence of reality and substitutes its place. It makes no sense to speak about external and internal worlds, because the construction itself is the definite, central part of the intellectual activity. The significance and the role of the place, the body, the distinguishable material and intellectual entities collapse, they become substituted by their interrelations and networks.

During the construction of the postmodern world view, the different possible worlds in the modern individuals got legitimized as natural and exclusive bases in the organization of the complete world view. In this way, the postmodern world has a necessarily plural nature. Perhaps it could be stated that the postmodern world view in respect of the relation to reality-virtuality simulates the images of the magic world view about the question. The postmodern view about reality and virtuality is an individualized (and evidently plural) simulation of its magic ideals.

It is possible to accept a less radical image of postmodernity. In this way of thinking, the postmodern world can be considered as a complex of the modern world and its critical alternatives. In this view, modernity is able to preserve its coherence but is unable to preserve its dominant position; it is just one of the many alternative systems of value. This less radical alternative does not change our images of reality and virtuality fundamentally, however, this version of postmodern thinking simulates the mythological rather than the magic ideals about reality and virtuality.

The postmodern reality/virtuality is created, perhaps, by imagination, which is a specific and concrete mixture of perception, will, and reason and it has a strongly individualistic nature. The postmodern world is open to include everything and to exclude (the) nothing. The postmodern personality is an inflating personality; it extends worldwide without gaining more weight.

In short, the postmodern virtuality can be described as reality and vice versa. This situation is created partly by a radical proliferation of reality, and partly by the disappearance of the reality-virtuality

boundary. Thus, there is no boundary between reality and virtuality; moreover, they have basically lost their independent meaning and it would be better to substitute both of these concepts with something else, perhaps with the concept of hyperreality. This means that, instead of reality or virtuality, the construction itself is significant for the postmodern person.

3. Philosophical Problems of Virtual Reality

Our quick overview of the history of ontology sheds light on the *various* ideological contexts of the concept of reality and its outcomes constitute the historical backgrounds for the following philosophical analysis. Overviewing the historical collection of realities and virtualities, it is almost clear that virtuality is either a kind of, or a constituent of, or an aspect of, or a part of, or a feature of, reality. In the usual context, these characteristics of virtuality are not clearly distinguishable, they regularly overlap each other.

There is no room here for a detailed analysis of all the relevant aspects of the problem, so the next part of our paper will focus only on those features of virtuality which play a fundamental role in the understanding of present-day virtual reality (VR in short). VR can be considered as a present, successful, direct, empirically informed, and relatively well understandable technology to create reality. VR is a *per se* representation technology, where the conditions, the circumstances, and the context of production of reality can be relatively clearly seen. However, in the VR the reality construction is much more simplified than in the case of "traditional" social/cultural systems, but this simplification can be useful. In this way, the analysis of VR can have a crucial relevance in the recent understanding of the reality-virtuality problem. Numerous aspects of the problem are presented and analyzed in a recent book [4]. The central concepts in our analysis are presence, worldliness, and plurality. All three acquire their meaning from a certain relation between actuality and potentiality.

3.1. Presence and Virtuality

According to the commonly held opinion, presence has a fundamental role in the existence of virtual reality [19–22]. Lombard's and Ditton's explication of the concept is based on an extensive collection of ideas about presence, and it is the following: presence is "the perceptual illusion of nonmediation. The term 'perceptual' indicates that this phenomenon involves continuous (real time) responses of the human sensory, cognitive, and affective processing systems to objects and entities in a person's environment. An 'illusion of nonmediation' occurs when a person fails to perceive or acknowledge the existence of a medium in his/her communication environment and responds as he/she would if the medium were not there. Presence cannot occur unless a person is using a medium." [19]. In this short definition the psychical and physiological aspects of presence are emphasized, but the authors propose to take into account its social aspects, as well. However, because of the primacy of the psychical elements in presence, some scholars say that "psychology is the physics of VR" [20]. It is obvious that presence should have to play a fundamental role in the identification of reality and virtuality, as well, because both of them presuppose a kind of presence.

At first glance, the person is the subject of presence, and a personal reality can be based on presence. However, there are strong historical arguments for the socio-cultural determination of the emergence and characteristics of the personality [16], including its abilities, perceptual, communicative,

and creative preferences. (From a constructivist point of view, it would even be possible to recall Karl Marx's thesis about the historical evolution of human senses.) Moreover, there is a similar historical evolution of the human body: the ancient, the medieval, and modern bodies are essentially different entities. Recently, there have been many investigations on the cyborg identity, which is a humanized (or non-human or posthuman) coexistence of biological and technical elements in the human beings [12,23–26]. In this way, if we declare the (embodied) person (with his/her personal body) to be the subject of presence, this subject will necessarily be a socio-culturally determined historical being and consequently his/her presence will have a similar nature. Any personal presence is necessarily a social presence. Most of the details of these problems are reflected in visions or elaborated in the theories of personality.

In the historical versions of reality and virtuality, some relevant aspects of the socio-culturally determined historical presence can be shown. For example, the premodern virtuality as ephemeral, contingent, uncertain, imperfect, impermanent reality is based on a premodern version of presence. This presence has completely similar characteristics to those of the premodern virtuality as it can be illustrated by the situation of the observer in the Platonic cave. Another Platonic approach to reality, which can reach the reality in full, is the remembrance of the soul to the world of Forms. This technology of reality demands a different kind of presence, which has a higher value or degree. It can be seen that even within the framework of one philosophical system, there are different kinds of presences and they have different degrees or measures. These presences are experienced or created to establish and support accepted reality-virtuality interrelations; within the same context the higher degree of presence yields to reality in full, but the lower degree of presence yields to virtuality.

So far, we have only discussed the concept of presence, but in the arts, in philosophy, and in some other fields of culture many, more or less synonymous concepts have been constructed, which can be used in the analysis of virtuality, as well. Just think of the Aristotelian actuality-potentiality concepts, of the arguments in the medieval debates between nominalists and realists, of the essential conceptual constituents of aesthetic theories, or of some categories of the speech act theory, or the concept of immersion used in many descriptions of virtual reality, *etc*. One of the most relevant concepts is the Heideggerian *Dasein*, which can be considered to be a specific unit composed of humanity, of presence, of reality, and of virtuality, *etc*. There is no room for a detailed analysis, but it can be found elsewhere [12,27].

In summary, some kind of presence is a necessary condition for any kind of reality and virtuality. The different versions and degrees of presence experienced in a socio-culturally determined way coincide with the ideas on reality and virtuality. The recent VRs prefer a technologically supported perceptual illusion of non-mediation. In this kind of presence, the human senses and imagination have to function in an artificial or simulated environment.

3.2. Worldliness and Virtuality

There is no doubt that presence is necessary for the construction of reality and virtuality, but, in our view, it is not enough. Pure presence, in absence of its—at least temporary or illusive—exclusiveness, unquestionability, and permanence, would be basically useless for construction. These characteristics ensure that one can form a complete unit from the experiences, which is called a unique system of

reality and can consider oneself as part of it. In other words, one can form a world around himself/herself. However, if the world-making is unsuccessful or incomplete from any point of view (the construction proves to be non-exclusive, questionable, impermanent) it will be declared virtuality instead of reality in full. This means that both reality and virtuality have (perfect and imperfect) worldliness characteristics.

Recently in philosophy, there have been many interesting descriptions of the structure and formation of worldliness. All of them seem to be relevant to the better understanding of virtuality. The Heideggerian description of the worldliness of the world, of its components (world, inclusion, involvement, *Dasein*, disclosing, *etc.*), and Heidegger's concept of "being-in-the-world" is analyzed carefully by Dreyfus [27], moreover, Heim [12] used some of their elements and motifs in his own interpretation of VR.

Another approach to worldliness can be found at Goodman. Cooper [28] applied Goodman's criteria for ways of world-making in his interesting interpretation of MUD worlds. (According to the Goodmanian methodology, world making consists of the following practices: composition and decomposition, weighting, ordering, deletion and supplementation, and deformation.)

For Heidegger and Goodman, everyday human praxis has a fundamental role in their systems. Because of this preference of their constructions, it is very reasonable to apply them in the interpretation a fundamental aspect of present-day VR. However, the present-day VR does not only have everyday-related, but some other aspects, too, and for their understanding we have to turn to other theories. For this purpose, we will turn to the aesthetics of Georg Lukács.

In Lukács's aesthetics [29] the work of art has worldliness quality. He used this concept to explain the "power" of the works of art on the senses of the recipients. With this "power" during the reception process, the work of art creates a different world for the recipient—different from the real, everyday world—orient his/her immersion in this constructed world, in the own world of the work of art, convince him/her about the reality of this world, and govern his/her state and thinking in this way. Every work of art has its own world, which is complete and closed from the point of view of its inexhaustible richness. However, these worlds are open, as well, they are open to reception. The worldliness of these worlds is supported by the homogeneous media of the work of art. The infinite richness of human reality is represented by a work of art using its homogeneous medium, constituted, for example, from the rhythm, the form, the colors, *etc*.

The Lukácsian conceptual structure seems to be very useful and effective in the description of the worldliness of VR. The operation of the "power" of the technological environment on the user, which ensures the perfect illusion of reality, can be interpreted in a very similar way to the power of the work of art on the recipient. In this respect, the "technology" of present-day VR and its manner of construction play the role of the construction rules of work of art. The artists of the VR are the engineers and the computer scientists. The homogeneous medium is a technologically mediated presence. The works of art are some kind of totality, they represent the very essence of the human world. The VR represents the everyday experiences of the human beings using the compositional requirements of art.

Realizing the fundamental role of technology in the VR worlds, the challenges of cyborg-existence, and the specificities of cyberspace, one can think that VR does not have any human, but rather a technological worldliness, *i.e.*, it is organized by technological principles. However, based on our

earlier discussion, we would advocate the opposite opinion. In the manner of the Lukácsian aesthetics, this complex of problems (the human-machine coexistence in a technological environment) can be described as a process of the antropomorphization of technology, the technological products, and the technical "space". Going further along a constructivist line, it could be said that the world of VR is not the world of humans nor the objective outside world, but it is an artificial production of the human-machine relation, a world of the human-machine complex—directly, but not indirectly. Indirectly, it is a representation of the personality-society, the individual-other individuals, *etc.* relations, because the machines (including computers and other VR technics) embody social relations and values (e.g., think of Latour's delegation idea), they are imbued with these values [30].

As a summary, it can be emphasized that presence and worldliness are correlated determinants of virtuality. They mutually support the functioning of each other. The worldliness of reality in premodern and modern virtuality appeared in such spheres of culture as art, religion, science and philosophy. The specificity of present-day postmodern virtuality is the dominance of senses and imagination in the construction.

3.3. Plurality and Virtuality

A kind of presence and worldliness of the experiences are necessary conditions for virtuality and reality as well. However, if we want to identify the specificity of virtuality, we only we have to reconsider the reality-virtuality relation. According to the historical tradition of ontology, reality should be considered as a unique entity, which covers the whole universe of beings. This is the concept of reality in full. If this reality is considered as a closed reality, there is no place for virtuality in this world. In this case, everything is a specific constituent in the only one reality since within reality there are no different measures or degrees of reality. The differentiation of virtuality and reality becomes possible only with the image of an open reality.

The *openness* means that a being is considered not only as actuality but as actuality together with its potentialities [31]. This means that an open reality can be considered as a complex of the reality in full and its numerous potential versions (of course, this is a very Aristotelian idea). Considering the reality in full and its potentially existing versions together from a quantitative position, it can be stated that reality has a plural aspect: all of these different versions in a certain sense belong to the same reality, and they can be counted as the numbers of the same. If we do not want to take into account the differences between the actual and the potential versions, we can speak about the proliferation or the plural nature of open reality. However, if we focus on the differences between the actual versions and the potential versions, we can use the concepts of reality in full and "reality less than full", *i.e.*, virtual reality. In this way, the concept of virtuality refers to a structured reality, a reality which is open, plural, and contingent.

According to the further analysis of the relation between actuality and potentiality, it could be seen that openness and virtuality are two conceptual formulations of this relation. While openness can be interpreted as actuality considered together with its possibilities, virtuality can be interpreted as potentialities together with their actualization. Openness is a feature of reality, virtuality is a feature of potentialities. They are inseparable from each other, their coexistence is the virtual reality. In this way

VR is a reality together with its possibilities and possibilities together with their actualization, or shortly: VR is the actualization of the potentialities of an open reality.

The actuality–potentiality relation is a specific version of the general one-many relation. The one-many relation has had different treatments in the history of thinking, for example, monism, pluralism, reductionism, statistics, *etc.* In this respect, the specificity of virtuality is the permanent transformation from the many to the one.

On the other hand, we can identify the transformations from reality to virtuality and *vice versa*, *i.e.*, we can consider the reality and virtuality in motion. There is no room here to treat the dialectics of these processes, so we just have two brief remarks. The realization of a possibility or the loss of the reality of a being are the very common courses of events.

The above-mentioned plurality was associated with the open reality and its possibilities. However, further important appearances of plurality can also be identified in the problems of VR, for example, the use of plural contexts, the plurality of the personality [32], and so on.

In short, it can be stated that virtuality cannot be interpreted without a plural reality. The plural reality is an open reality and its openness is deeply connected to its virtuality. Virtuality is a feature of the potentialities of an open reality and refers to the potentialities together with their actualization.

4. Representation Ontology and Virtuality

Based on these historical and philosophical analyses, we try to propose an approach to virtuality, which is able to accommodate the outcomes of the historical and philosophical trains of thoughts presented above, and, at the same time, is able to depict some consequences of the recently emerging representation technologies [33].

As a first step, let us return again to the Aristotelian ontological views. Aristotle's main contribution to the ontology was his teaching about the clear distinction between the two levels of being, namely between the actuality and the potentiality. The actual being is a being in full, and the potential being lacks fullness. However, according to the Aristotelian thinking, both the actual and the potential being are due to every entity, which means that reality and virtuality are distributed among the beings of our world instead of their (Platonic) concentration into completely separate worlds. On the other hand, Aristotle described and analyzed the transformation of potentiality to actuality and *vice versa* and he interpreted the concept of motion in this way.

In the second step, we propose that the Aristotelian dualistic ontological system, which distinguishes between actual and potential being, be complemented with a *third form of being*: *virtuality*. In the virtual form of being, actuality and potentiality are inseparably intertwined. Virtuality is potentiality considered together with its actualization. Openness is actuality considered together with its possibilities [34,35]. As compared to reality, virtuality is reality with a measure, a reality which has no absolute character, but which has a relative nature. The "classical" concept of actuality and potentiality can be considered as two "limit-values" on a segment, where the segment of a line represents the extended realm of virtuality between the two "extremes" of absolute actuality and absolute potentiality. In other words we can speak about virtuality as a continuum of reality (this view differs essentially from Milgram's reality-virtuality continuum [36], in which the two "extremes" are real and virtual, and the medial points are mixed of them).

All beings produced by representational technologies are necessarily virtual. The reason can be found in the very nature of representation. There is no representation without using signs. In other words: there is no representation without two kinds *of* beings, or two contexts for the beings. The sign has a specific, double nature: the sign is an actual being, but at the same time, potentially something else. We can identify something as a sign if and only if these two faculties of its nature (actually something *and* potentially something else) are simultaneously present—for example, these are actually letters and potentially concepts.

In other words, every kind of "re-presentation" presupposes two kinds of beings (the beings what are represented and the beings what are representing them) or two different context for the beings (to consider the same thing in two different manner). It is crucial that there is a necessary interrelationship between these two kinds of beings or contexts to create re-presentations. Re-presentation *per se* is the existence of this relation. The (free) creation of this relation is sometimes called coding or signifying. Any kind of relation is a source of the "actually something, but potentially something else" nature of a thing. Representations produce necessarily such virtual beings. On the language of philosophy, it can be stated that representations have a specific ontological characters: the ontology of relations, or interrelationships, which—in the proposed sense—is the ontology of virtual beings.

To illustrate how technologies produce virtual beings, let us consider information technologies. The characterization of information technology should be based on an understanding of the concept of information. Obviously, there is no information without use of signs, so information is a product of a kind of representational technology, and thus it is virtual being.

In a hermeneutic approach, information is "interpreted being". On this account, information technology is a "hermeneutical industry", where the production is performed by interpretation in the minds of people. All the products of this "industry" are virtual beings. Consequently, social being in the information age is necessarily a virtual being. Information society is a society where the typical beings are virtual ones, and so the whole society has a virtual and open characteristic.

Additionally, the Internet can be considered as a kind of information technology. It is an intentionally created and maintained artificial, virtual sphere that is based on networked computers and individual human interpretation praxes. Thus, the Internet is the medium of a new, virtual mode of human existence, basically independent from, but built on, and coexisting with the former (natural and societal) spheres of existence, and created by the late-modern humans [34,35,37].

5. Conclusions

This situation can remind us the emergence of probability in the 17th century [38]. Then, the concept of certainty, now the concept of reality is reconsidered and relativized. From the 17th century, a new worldview (probabilistic/statistic/dialectic/*etc.*) emerged and had a crucial role in culture and even in the science of the 19th and 20th centuries (theory of evolution, quantum physics, *etc.*). However, the classical "deterministic" worldview survived as well.

Currently, in the description of the world created by representational technologies, there are two essentially different consequent worldviews, with different ontologies. In the "classical Aristotelian" worldview, the world is inhabited by (absolute) actual and (absolute) potential beings. This view is really effective in the understanding of our world inhabited with macroscopic bodies, but it is not

really useful in the understanding of mental or cultural components of our world. These difficulties became much more significant because of the dominant role of representation technologies in the construction of the social being. Fortunately, we have another interpretational possibility on the reality: all of the beings in our world can be considered as virtual beings, *i.e.*, real beings with a different, finite measure of reality. However, it is possible to accept some kind of mixture of these two worldviews and to speak about a world which is inhabited by actual, potential and virtual beings, or three separated worlds of these entities (in a slightly similar manner as Popper proposed), but this view would produce incoherent or paradox ontological situations as we will show it another paper.

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Conflicts of Interest

The author declares no conflict of interest.

Abbreviations

VR: virtual reality

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33. This double background can be considered as the specificity of our approach to the virtuality problem. Such important contributions to the problem as Whitehead's or Deleuze's views have essentially different backgrounds. This is the reason that here we do not consider them.
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