

Exploring Tomás Maldonado

EDITED BY

Pierfrancesco Califano



Fondazione
Giangiacomo
Feltrinelli

Scenari 45

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Viale Pasubio 5, 20154 Milano (MI)

www.fondazionefeltrinelli.it

ISBN 978-88-6835-458-9

First digital edition June 2022

Direttore: Massimiliano Tarantino

Coordinamento delle attività di ricerca: Francesco Grandi

Coordinamento editoriale: Caterina Croce

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Semiotics of the Virtual in Design

Camelia Chivăran, Roberto Cognoli, Alessandro Ianniello

Introduction

In the contemporary context, the virtual dimension is gaining an increasingly significant role as tool for sharing knowledge and for the construction of an augmented experience by integrating new perceptual stimuli. Such potential and opportunities are having an impact on different disciplines and sectors, influencing the ways how an architecture, a product, and a system are designed and used. The project can no longer be conceived considering only its physical dimension. It has in fact become necessary to integrate the virtual dimension in order to allow on the one hand to represent and thoroughly visualise all the phases of the process, and, on the other hand, to facilitate the users' interactions or the communication with the potential clients. Additionally, tools of virtual and augmented reality enable the experimentation of spaces and products in an immersive way, before being physically constructed (Riva, Gaggioli, 2019). Therefore, the virtual dimension becomes a tool that favours interaction with the reality (Bur-

dick et al., 2014), being one of the layers that constitutes it, and where interactions that might impact it take place.

Over time, the meaning of virtual has gone through several transformations, from *virtual-actual* to *virtual-illusory*: in the first case, the new perceptual stimuli are thought to expand knowledge, while in the second case, the non-perception becomes stimulus for new knowledge. In this regard, during the last sixty years, different meanings have been given to the concept of virtual: Gilles Deleuze (1988) defines it as potentiality which is realised in the present and which, although not material, is real. In the same direction, Pierre Lévy (1998) claims that the virtual is not opposed to the real, but to the concept of presence.

A different direction is that of Berthier (2004), who indicates the virtual as something that is not real, but which has all the qualities to be considered as such, thus claiming the existence of the possibility to perceive what is virtual; Massumi (2014) sees the virtual as a complementary abstraction to the concept of actuality. Recently, Bailenson (2018) reconnects to the concept of illusory, claiming that a virtual system creates in the user the illusion of being situated in a space where one can interact with objects and agents situated within.

The contrast, or the closeness, between these two concepts represents an important stimulus for the semiotic, sense and meaning research which, in turn, represents one of the constituent elements of the apparatus underlying the design disciplines (Zingale, 2012).

To approach this topic, the paper is structured into four sections, namely dealing with Maldonado's vision regarding the semiotic problem around the real and the virtual; a review of the issue from a contemporary point of view; an examination of several useful examples to put the state of the art of the topic into context; and, finally, the conclusion reporting on issues that remain open and unsolved.

Binomials in Maldonado's View of the Virtual

Maldonado fits into this debate by stating that he considers the virtual as an illusion, and thus adheres to the line of thought that sees a strong antagonism between the two terms.

One can notice how, in his own works, Maldonado deals with the topic by introducing several binomials, strongly connected with one another, that take into account the various relevant aspects: he talks about the concepts of *navigation and immersion*, *similarity and simulation*, *representation and communication* and, finally, *creativity and knowledge*.

In the following subsections, the different binomials will be analysed, providing a first reinterpretation updated to the contemporary context.

Navigation and immersion

Maldonado states that the perceptual behaviour of the individual in front of a figurative image reminds of the typical motion during navigation, as a continuous flow of movements between surface and depth, through different calls for the observer's attention and curiosity (Maldonado, 1992). Delving into the topic of navigation in a virtual space, Maldonado compares the representation made with the support of traditional techniques, to the computer simulation of a virtual environment. He actually claims that in the first case navigation is certainly virtual, since it is subjective and mental, while in the second case navigation loses virtuality, since the observer gets the feeling of (almost) actual navigation in an (almost) real space. Specifically, in the case of a computer-modelled space, the user has the illusion of being an industrious actor within a space, without realising that this is a space where degrees of freedom are very limited, a space where he can only operate, so to speak, under conditions of probation. Therefore, according to the author, the distinction between strong virtuality of

the digital space and weak virtuality of the analogical space should be re-examined (Maldonado, 1992).

Although at the time of writing *Reale e Virtuale* the author's statement was not only true but extremely far-sighted, a series of subsequent transformations and technological innovations, illustrated in the following paragraphs, have led to a further reversal of the dichotomy. A strong virtuality includes more immersive navigation in spatial terms and not in temporal terms: the temporal connotation is instead assigned by Maldonado to weak virtuality.

In fact, with reference to the concept of immersion, Maldonado argues for the usefulness of understanding the temporal aspect of experience within a synthetic space, i.e., the possibility of immersing a subject in a virtual construct, leaving him locked in it forever, only exists in science fiction. Therefore, he claims that the actual time duration of immersion in virtual space must necessarily be limited, and it should be followed by resurfacing, i.e., the return to physical reality. One should be free to abandon virtual reality, to voluntarily interrupt the experience (Maldonado, 1992). Nowadays, such a concept is still applicable, despite the tendency of increasing the time length of immersion and, especially, by engaging the various senses in the process, expanding it from a spatial and experiential viewpoint.

Similarity and simulation

Maldonado introduces the concepts of similarity and simulation in relation to the project, underlining the need of the commissioner since the Renaissance period to see in advance the development of the building he wanted to realise. Referring to the virtual as a synonym for the *illusory*, the author highlights the need for people to illusorily decorate the world, to generate illusions and believe (or make believe) that they are real. The concept is thoroughly analysed with reference to the differences between the perception of a highly realistic virtual object and the perception of the same object in the real world, with the intention to understand the degree of reliability from a cognitive point

of view, and to analyse, therefore, the *adequate simulation* between a virtual and a real object. From this perspective, also the prototype of a product can be more or less similar to the product to be realised, expressing different intensities of modelling. To this effect, Maldonado also highlights the need to take into consideration the context of study, i.e., “lo spazio della vita” (*life space*) that provides insights regarding the interrelations between objects, spaces and people (Maldonado, 1992).

One can notice how the current systems tend to transport the observer into a *parallel* space and to transform such space of a *virtual* project into a second reality. Thinking about the preview of any architectural or design project, the current systems enable the user to step inside the project space, to feel *present*, therefore to transform it into a true, personal, parallel reality. Nowadays exploration becomes the first form of interaction inside a virtual environment (Riva, Gaggioli, 2019).

Thus, the concept of presence gains a fundamental role: a virtual environment is performant based on how much it can make people feel present; presence represents, therefore, the subjective degree of how a person perceives being physically and mentally present inside a simulation (Riva, Gaggioli, 2019). For the design of a virtual reality system, it will therefore be necessary to analyse the role of the perceptual, cognitive and emotive processes engaged in the experience (Riva, Gaggioli, 2019): the more the model generated by virtual reality is similar to the brain model, the more the individual feels present in the world of virtual reality (Riva et al., 2019).

Representation and communication

Maldonado wonders about the ways of discovery, invention or explanation enabled and made possible by representation: from the author’s viewpoint, the architect is born as a visualizer. It becomes therefore compulsory to understand how to represent ideas, concepts, projects, in order to communicate them efficiently to the customer

and to the final user. The author thus defines models and mock-ups as tools and, in a way, communicative interfaces, acting as pre-realisation, visualisation elements, thus facilitating dialogue between designers and clients. A particularly interesting element in Maldonado's writings is the *drawing*, that he sees as a *drawing-project*, i.e. *a spontaneous and intuitive exercise on a specific problem to be solved, an object of the project and a project tool*: if the previously named elements have an explanatory and communicative function, the *drawing-project* becomes a tool for discovery (*a problem to solve, an object of the project*), and at the same time, a tool for invention (*spontaneous and intuitive exercise, project tool*).

For Maldonado, the revolution in information technology has helped to open up new perspectives for modelling, both in its *design and communication functions*, giving professionals access to the tools, methods and functions of traditional modelling and increasing its effectiveness (Maldonado, 1992).

The contemporary interfaces and specifically the innovative ones, enable a series of design and meta-design opportunities, starting from the representation techniques until the simultaneous exploration of the material behaviour and of the production limits.

Creativity and knowledge

Maldonado claims the existence of a connection between the evolution of the creative practices of representation and the one of the production techniques, each of which has generated a different response to our innate need for virtual (Maldonado, 1992).

He participates in the debate on the concepts of invention, iconism and referentiality, questioning whether it is justifiable to consider the icon as reasoning in the logical sense, or whether it is correct to assume that it can take on the character of a true declarative propositional form. He states that when it represents an object through inanimate means, it constitutes a configuration with a high degree of

systemic compactness, emphasising homogeneity between the constituent parts (Maldonado, 1992).

He also acknowledges that we do not yet know what surprises the development of thought technologies combined with the most advanced technologies of perception, such as computer graphics, may bring us (Maldonado, 1992).

Referring to this issue seen in a contemporary perspective, one can notice how the *extended realities*, one of the most innovative elements of the virtual, offer the opportunity of imagining and building new meanings, often outside the traditional semiotics sphere and mechanisms.

Contemporary Vision

As previously stated, during the last period, a growing innovation drive in several technological areas has opened up new and unexplored opportunities which in turn have led to a change of perspective in the real-virtual issue. One could therefore state that in the strong virtuality, the navigation becomes more immersive in spatial and not temporal terms, a feature that Maldonado assigns to weak virtuality.

Consequently, a process of *spatial exploration* of the models themselves becomes accessible, through a progressive approach and magnification of the element under consideration, and investigating its *micro* aspects, without losing a *macro* point of view.

Furthermore, the current systems allow us to simulate spaces and environments in a parallel reality, transporting the observer into a space that enables him to actually feel present. Presence becomes in fact one of the most important characteristics for the authenticity of experiences within realities beyond the exclusively physical one.

The strong virtuality has acquired a representative and communicative dimension similar to the one of weak virtuality: one can therefore talk about *virtual-project*, intended as Maldonado's *drawing-project*.

The design opportunities provided by the *extended realities* (Skarbez, 2021) enable designers to imagine and build new meanings, often

outside the traditional semiotics spheres and mechanisms. They allow therefore to go beyond the concept of referentiality and iconism, since they are not traditional media (theatre, cinema, television, social media), instead they involve a different level of user engagement.

As the traditional media have stimulated the semiotics debate, the extended realities are shifting the focus to the creation of new or different senses and meanings, generated by or attributable to elements which are not normally considered in the traditional view. These not only act as representations and simulations of the physical reality, but they are also capable to deconstruct the sensory, perceptual paradigms and therefore the creative and imaginative ones, that all exist in the physical world (Wellner, 2018): digitalization and virtualization are not supposed to be seen exclusively as technical means, instead they refer to the ways through which one gets closer or farther from a representation (Wolfe, 2010). One can speak, in post phenomenological terms (Ihde, 2009), of technological mediation in the examination of human experience.

In this regard, one can define a perceptual enhancement through technology, which thus makes it possible to experience what would not be so without its integration; and a shift in perception by means of instruments, relating to the hermeneutic aspects of experience (Wellner, 2018).

One can state that human actors and technologies (digital, virtual, extended, and immersive) interact and share cognitive capacities inside the *cognisphere*, defined as a complex and interconnected system where human actors and technological actors coexist (Hayles, 2006).

After examining the theoretical issue from a historical and contemporary point of view, several questions were identified which we sought to answer through an analysis of examples of interest (as presented in the next section). Resuming a question posed by Maldonado himself in *Reale e Virtuale*, one wonders about *the future of modelling caused by the information technology revolution*, and in relation to this: *how do virtual tools influence contemporary design practice?*

Taking into consideration the definition of virtual, its future developments and its knowledge and experiential value, a further question raising particular interest, but also a more complex one and, therefore, subject to different possible interpretations, is the following: which definition (virtual-actual or virtual-illusory) is the most adequate?

The Virtual in the Project

The dimension of the project is virtual by definition, as a place where ideas which are not yet concrete can be foreshadowed. The individual has always used mediums and interfaces to visualise and understand representations of the virtual (project - prefiguration) in the real.

If, once, intuition and experience were the only available tools, in the course of history the individual has constantly searched for new means in order to be able to represent and make real increasingly complex ideas. The perspective and the passage to the digital drawing are two crucial moments of this searching process. What makes the relationship between project and representation interesting is certainly the relationship between different media.

The use of the virtual dimension in the various facets of the project becomes a potential strength since it can increase the levels of information about space, about the product and about the system, enabling to preview elements that once could only be imagined. It contributes to rendering the entire process more efficient, and it allows in some cases to increase safety, to optimise the flows of pre-production and to envisage the functionalities and ergonomic qualities of the products (Riva, Gaggioli, 2019).

One wonders, therefore, how the cognitive and experiential dimension of the project will be affected, when physical and digital reality will be mixed and mutually interactive.

In order to answer this question, a number of examples have been considered, categorised into project tools, software and platforms, some of which will be reported and described below.

Project tools

Besides providing a higher level of simulation and a major realism to the virtual experiences, the current project tools have the potential to provide tactile properties to elements that do not normally have them, provoking synesthetic effects.

Due to these innovations, it is possible to give humanity back to the operations of 3D modelling and provide three dimensional gestures to traditional tools. The current dimension goes beyond the analogical, trying to immerse the user in the project, increasing the awareness and enhancing the production. The concept of *virtual* often departs from Maldonado's *illusory* where digital elements contribute to the construction of physical reality, or at least of a hybrid between the physical and digital dimensions.

In particular, in support of these theses, the example is given of a pen for modelling and drawing in virtual environments (Figure 40), produced by the company Massless as of 2017: due to this tool, designers can carry out increased and ergonomic activities from a three-dimensional point of view; immerse themselves in the various technical, formal and usage aspects; allow a sensory and perceptive amplification that enables them to experience the project in new ways (Massless, 2020).



Figure 1 VR Design Pen, Massless

Project software

Recent applications in programming and software are making it possible to design free of rationalisation schemes that can, to some extent, influence design choices, thus allowing the design to be subject to a few different constraints than more traditional practices.

The role of drawing as the sole means for achieving the design goal, as stated in one of the preceding paragraphs, is therefore no longer indispensable. The dimension of the project succeeds, in a sustainable manner, in recovering the scale of reality of the 1:1 prototype.

To support this statement, the example of the Fologram app and plugin is given (Figure 41). Produced by the company of the same name, it allows designers to build an interface with a hybrid, phygital dimension, in which the virtual becomes a new layer of reality, containing a series of peculiar and unique information, structures and tools (Fologram, 2022).



Figure 2 Mixed Reality App and Plugin for Design and Construction, Fologram

Project platforms

The virtual dimension enables designers to exchange information in real time, through the use of specific digital platforms. In this way, a multidisciplinary process is facilitated, a process of integration and sharing of knowledge, supported by the mixing of the two dimensions considered.

Here too virtuality moves away from Maldonado's *illusory* concept, becoming a constituent part of reality. It can be stated that the project moves into a shared, virtual and accessible space, where several players contribute to the creation of a *computer model*, which is no longer representation, but reality in which it is possible to verify every design choice.

As for the previous categories, one of the analysed case studies is shown to highlight the stated aspects: the 3D Experience platform, designed by Dassault Systèmes (2022), an actual project ecosystem, within which it is possible to access modelling, simulation, information, and applications for collaboration (Figure 42).

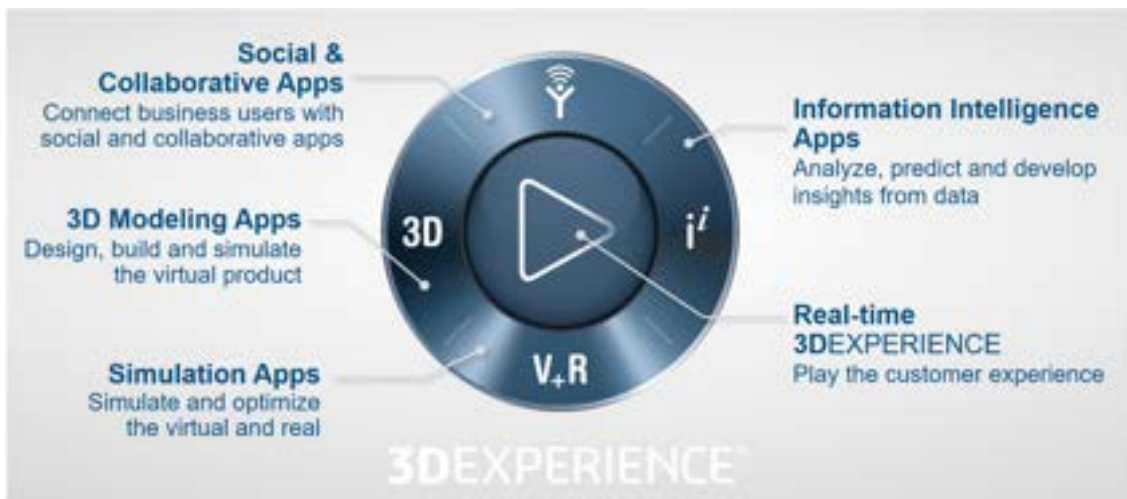


Figure 42 3D Experience, Collaborative Design Platform, Dessault Systèmes

Conclusion

The analysis and reinterpretation of the concepts of real and virtual, both in Maldonado's work and in the thinking of other researchers and academics, leading to practical and design applications, stimulate various reflections on the subject. As reflected in Maldonadian thinking, the continuous evolution of the technologies and the numerous applications in the project suggest that *we do not know yet, or we do not know enough, how the design creativity will be able to develop in the context of this new modelling universe* (Maldonado, 1992). Not only in the modelling field but in all aspects of the project, the influence of the virtual is generating a series of relevant transformations.

In this regard, it is interesting to consider *mixed reality*, the latest frontier of technological innovation in the area of the *continuum* between real and virtual: it allows a deep blending of real and virtual space, permitting the interaction, in real time, between physical and digital elements and a consequent transformation of the latter ones according to specific requests or actions. The question arises, therefore, of how the cognitive and experiential dimension of the project will be affected when physical and digital reality are mixed and mutually interactive.

As demonstrated by the different case studies, the virtual becomes a new tool, a new interface and design platform, it goes beyond two-dimensionality into a shared three-dimensional space, where there are interactions with the real.

Not only does it have the same characteristics as a *drawing-project*, but it evolves them in a new and peculiar way.

The contribution concludes with an open question, which can serve as a stimulus for further research and investigation: what is the future of the virtual and how can its cognitive and experiential dimension be defined in relation to the practice of design?

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