Design as cultural mediation in the experience of things as causes[1]

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1. The etymology of the English word "thing" reveals a journey from meaning an assembly, which was decided on beforehand to take place at a certain time and at a certain place to deal with certain "matters of concern" to the community, to meaning an object, "an entity of matter." So, the term thing goes back originally to the governing assemblies in ancient Nordic and Germanic societies. These pre-Christian things were assemblies, rituals, and places where disputes were solved and political decisions made." (BINDER *et al.*, 2011, p. 1). In Portuguese, there is an etymological connection between "thing" and "cause", term I will adopt in place of "matter of concern".

1 Introduction

What is Design? What is Design like? Is Design Art? What is the relationship between Design and Science or between Design and Engineering? What is Research in Design? How many times have I been asked these questions...

By the time the Degree Program in Design was created at the University of Aveiro (1995), the scarcity of texts kept in debate the definition proposed by Tomás Maldonado in 1969 for the International Council of Societies of Industrial Design (ICSID) as the teaching of Design was aligned by a bauhausian matrix (ULM). A decisive moment in which this ontological questioning about Design became denser happened 17 years ago with the decision to break with the tradition of a Design education organized by specialties, recognizing that the epistemological essence of the project was independent of its application.

This debate about the ontology of Design is permanent, in the necessarily slow and not always peaceful course, in which Design education moved from a territory close to craftsmanship, inherited from the artistic apprenticeships of the former Schools of Fine Arts, to the university, more and more oriented to research.

Many of these issues and "confrontations" were resistant and continue to be so, to the process of "naturalization" imposed by the academy, itself subject to compliance with the standards involved, for example by external accreditation and evaluation.

How to offer, in Design, an education focused on research? It has always been relevant to understand what kind of research could give Designers and researchers in this area an active, differentiated, but accredited participation with the academic community and the agents who evaluate these efforts.

In 2007, with the creation of the research unit ID + (Institute for Research in Design, Media and Culture)[2], all these issues became urgent.

2. www.idmais.org

It was necessary to participate in the construction of a building whose foundations demanded the solidity of credible doubts and where each compartment would open up to relevant challenges, organized by viable strategies for the production of new knowledge.

A clear discourse on Design and Design research has always been necessary, and so I repeat what I have already written and said many times about the need to recognize the specificity of artistic areas. To judge them in unfamiliar territory is to compromise them. One runs the risk of including in the system artists who only write scientific articles or designers who no longer design, because the purposes of the research move them away from desire and drawing in exchange for the promise of acceptance in an academic community that subjects them to a language which is not theirs by nature.

But to have a clear discourse on Design, one must insist on formulating up-to-date answers to the usual question: What is Design? And this question remains current in the face of the increasing extent and complexity of contemporary design.

Teresa Cruz (2015) points out that this extension of the field of Design is not understood as merely horizontal, but rather as

> [...] a methodological 'infusion' of a vertical deepening of its place in the order of knowledge, placing it at the level of the universal foundations of rational and creative action, as the very cement that unites reason and imagination and guides them to action (CRUZ, 2015, p. 81).

In *A Cautious Prometheus? A Few Steps toward a Philosophy of Design (with Special Attention to Peter Sloterdijk),* Bruno Latour (2008), emphasizes the "extraordinary career of the term" Design, which now extends "[...] from details of daily objects to cities, to landscapes, to nations, to cultures, to bodies, to genes, and, as I will argue, to nature itself in great need of being re-designed." (LATOUR, 2008, p. 2).

The article *The Most Important Design Jobs Of The Future*[3], published in 2016, whose purpose was to characterize the future of the Designer profession, interviewing the main Designers of some major American technology companies, leaves us with the feeling that some of the advanced typologies of jobs in these interviews oscillate between the boundaries of verisimilitude and fiction.

On the other hand, Ezio Manzini (2015a) in his book *Design, when everybody designs* – an introduction to the theme of Design for social innovation – revises the ontology of design, starting from the recognition

3. www.fastcodesign.com/3054433/the-most-important-design-jobs-of-the-future. Acessed in: 06 Set. 2017.

that the combination of anthropological capacities of critical sense, creativity and practical sense, lead to a way of acting of the Design type. In the conceptual redesign of Design, proposed by Manzini, in consonance with Papanek (1984/2009), we are all designers, although some - the experts – are more than the others.

The plasticity in the concept of Design – "a discipline to which it seems possible to tolerate indefinition" (FRECHIN, 2008, quoted in VIAL, 2014, p. 2) – allows its molding by discourses with different, perhaps contradictory objectives. See the case of Cameron Tonkinwise (2014), in the article *Design away* in which he proposes, in the context of his militancy in favor of sustainability, that the design can be used against itself.

> *But I want to suggest that not-designing is also a kind of designing; it can be proactive, a deliberate strategy to undesign, to make existing designs disappear. The opposite of the* vita activa *of making, of designing things into existence, is not merely the privatively passive* vita contemplativa*, but rather the very active act of unmaking aspects of our locked-in world—designing things out of existence* (TONKINWISE, 2014, p. 1).

It is in this context that Stéphane Vial (2013b) formulates the hypothesis of existing between the designer and contemporaneity, a communicational framework tendentially psychotic arising from the challenges contradictory to his thinking.

> *Making design today requires designers' strong psychological skills to be able to ponder on contradiction. The difficulty is at once to be enough idealistic in order to keep trying to change the world and enough realistic in order to keep in mind that designers are not omnipotent magicians* (VIAL, 2013b, p. 3).

In this paradoxical context, if we are all designers and if everything is Design, I ask: what characterizes it? How do you recognize yourself? How is it taught?

The intention here is not to make any moral judgment or debate the validity of the different perspectives mentioned above. The ontological plasticity of Design seems to cover different points of view that adapt to its definition, in each moment, to the most convenient discourse.

Design definitions are often key to the puzzle that allows the deciphering of a work or sign, which encodes the set of values or ideals that anchor the judgment about qualities of the hypotheses that are outlined as solutions to a project. And to educate students of Design is to enable them to, autonomously, develop their axiological framework and compose their judgment accordingly.

There is no definition of design that is universally accepted by professionals and academics, which makes it indispensable, or at least prudent, to make a statement so that at least one starting point is known....

4. This point integrates and expands the article "Design as Cultural Mediation between Matter and What Matters", written in partnership with Francisco Providência and published online by *The Design Journal em Nov*, 17, 2017.

2 From Vitruvius to contemporaneity[4]

2.1 The triadic model: authorship, technology, program

The Vitruvian-inspired triangular model (FIG. 1a) proposed by Francisco Providencia (2003) was and has been structuring in the construction of a discourse to clarify the ontological contours of design.

> Vitruvius' architectural principles are based on the set of requirements to which all constructions should respond: utility (convenience), beauty (pleasantness) and solidity (durability) - *utilitas, venustas* and *firmitas* -, later taken as an intentional basis of all classical Architecture (book I: chapter 3) (PROVIDENCIA, 2012).

In detailing this conceptual trilogy [5] – authorship, technology, program – if the vertices technology (means of production, construction) and program (utility, functionality and performances) are acknowledged as revealing the set of constraints to the project, the "authorship" vertex indicates hermeneutical responsibility, as well as ethics and aesthetics.

5. The justification for the proposal of this model and its description are detailed by Francisco Providencia in his PhD thesis (2012) Poet, or one who does: poetics as an innovation in Design, and previously in the article *A little more than a propeller* (2003).

It is interesting to note the proximity between this model and the approach taken by the Design Museum of London in structuring the exhibition Designer Maker User. "*Design is the product of an intersection between the three key participants of the designer, user and maker. [...] Generally speaking, professional designers respond to briefs given by manufacturers who are influenced by production processes and commercial imperatives*" (NEWSON; SUGGET; SUDJIC; 2017, p. 7).

But in the triangular model proposed by Francisco Providencia, there is no acknowledgment of any prescriptive will to heuristics that guarantee good practices in Design. The model aims to situate the Design action, stating the polarities that influence the design paths.

Design theory is not, nor should it be, a scientific theory in the strict sense of predictability of action. On the contrary, it should be a tool that emanates from the reflection on doing – action-oriented and context-dependent – from which designers can develop their ethical and aesthetic judgment (EHN, 2007). A practical wisdom (phronesis), which can allow the virtuous adaptation of the chain of project decisions to its contextual constraints (technological and programmatic).

This seems to be the perspective that encourages studies on Donald Schön's "The Reflective Practitioner" (1983, 1987) to demonstrate the interactive features of the design process (the "dialogue" between the designer and the situation) and iterative (reflection-in-action and the development of theories as they are used as anchors for the evolution of a hypothesis).

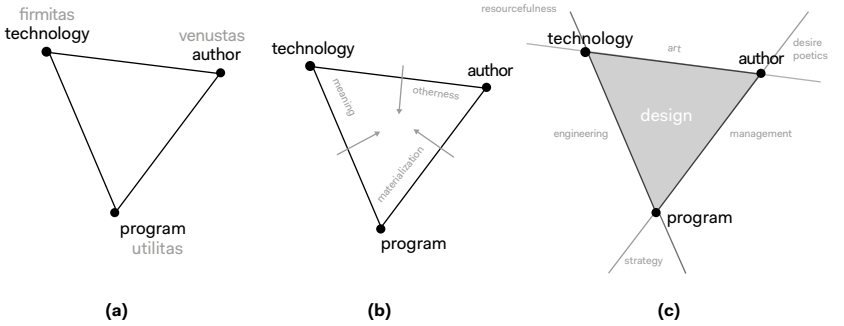


FIGURE 1 –Triangular model (a), Model analysis (b), Design as interface between other disciplinary approaches (c). Source: VASCO BRANCO, 2014.

In the article Design and Design Research: some thoughts, for Branco (2014), I developed a geometric analysis (FIG. 1b) on the triangular model that allowed to demonstrate that any Design solution results from the negotiated convergence of the simultaneous interpretation of three categories of requests that emerge either from the presupposition of the materialization of an artifact (independently of materiality) either from the consciousness of the other, or from the need to produce meaning (meanings).

Yet, it also allowed to plainly establish the positioning and relationship of Design with other disciplinary approaches (FIG. 1C) as a triangular enclave at the intersection of territories that other disciplines do not occupy by their implicit nature, since the authorship (the poetics) it does not matter, epistemologically, to engineering. Art does without utility and management does not need to be directly confronted with the constructive dimension.

For Krippendorff (2006, p. 48), "putting meanings at the center of the project considerations will give designers a unique focus and a specialization that other disciplines do not address." The presented analysis confirms this perspective but characterizes the project as a mediation drawn and materializable between desired (preferred?[6]) futures and possible futures, once it is conducted from the conceptual space of authorship. A mediation that is culturally and socially situated (SUCHMAN, 1987).

6. According to Herbert Simon "[...] courses of action aimed at changing existing situations into preferred ones" (SIMON, 1996, p. 111).

The triangular model seems to reveal an efficient behavior in the answer to the questions of delimitation of the disciplinary field, making clear the role of cultural mediation that is attributed to Design. However, it should be reasserted that in this model, its boundaries (the sides of the triangle) are neither considered stable nor impermeable. The model must be understood as the structure of an organic and porous form, polarized around the three kinetically animated essential particles.

This triadic model was implemented in the pedagogical experience of Design at the University of Aveiro, which implied rethinking the curriculum for the 1st cycle (licentiate degree) as experimental project laboratory[7], structuring it from author to program, going through technology.

But it also meant converting a stratified formation into Design specialties (industrial and communication), making it converge into a global project idea more suited to the Portuguese economic fabric, made up of 90% by SMEs. The course became the first licentiate degree in Design, which was taking baby steps at the time, at least in Portugal, and at the level of initial training, an approach centered on the conceptual essence of project.

Thus, Design appears as a cultural mediation activity that translates into the design of artifacts, devices and services.

7. The Project curricular unit is structured as an experimental laboratory that, although encompassing all vertices, is organized to focus on the vertex of the author (exploring / drawing the student's own language) during the first year, at the vertex of technology (comprehension / confrontation with materials and with production constraints), in the second year, and in the program vertex (dealing with companies, negotiating with clients), in the third year.

This definition of Design (Providencia, 2012, p. 53) values the sensitive (aesthetic) dimension that Drawing can lend to Design as a methodological instrument, open to the diversity inscribed in the "materialization" of possible results while emphasizing the cultural characteristic attributed to its intervention. Hence, we can infer that artifacts, devices or services that intervene culturally refer to Design or, in other words, intercede (synonymous with mediation) culturally in favor of people. This reading of the definition by Francisco Providencia brings it closer to the statement by Serges Gagnon (quoted in LUNENFELD, 2003, p. 10) that defines Design as "the cultural appropriation of technology", meaning appropriation of how to make it appropriate or convenient[8].

The consideration of Design as cultural mediation, concerns at different levels:

- because it places the intervention of Design in the construction of the interface – in the middle, between people and functionality, needs and desire;
- because it defines this intervention as a symbolic construction and, therefore, as an operator about the reality(ies), configuring the experience of the world;
- because it qualifies Design as an aesthetic operator capable of epistemologically involving the totality of the being:

> *It is not possible to divide in a vital experience the practical, emotional, and intellectual from one another and to set the properties of one over against the characteristics of the others. The emotional phase binds parts together into a single whole; "intellectual" simply names the fact that the experience has meaning; "practical" indicates that the organism is interacting with events and objects which surround it (*DEWEY, 1934/2005, p. 56-57).

8. According to Priberam dictionary (www.priberam.pt), Acessed in: April 9, 2017.

But the triangular model seemed (seems / is?) adequate as an instrument for analyzing the artifacts in the sense of their *reverse* Design (this term has been created by similarity with the concept of reverse engineering), that is, in understanding the chain of decisions that lead a project to converge into a solution (BRANCO, 2015).

For the transformation of this model into an operative instrument, which allowed to map an artifact at a point within the three-dimensional space with the axes author, technology, program, it was necessary – at first – to define a set of heuristics that allowed the classification of an artifact relative to each of the vertices. For this purpose, Francisco Providencia has developed a classification of the relation (influence) that each of the vertices (pole) can have (exert) in the configuration of the conceptual space of an artifact.

This matrix of criteria has opened up the possibility of transforming qualities into quantities and hence, of developing relevant triangular model-focused digital applications both to support artifact analysis (FIG. 2) and as an interactive device for exploring a universe of artifacts.

The prototype developed, although incomplete, allows to reflect and interact on the theory that gave rise to it and demonstrates that drawings and prototypes in Design are not confined to the representation, but behave like *l'espace d'élaboration d'un idéal qui prend forme* (VIAL, 2013a, p. 8).

It is worth stating that the triangular model is only intended as a contribution to the understanding of the conceptual dimension of Design, not extending to the social life of the artifacts drawn. Findeli (2010) considers that "a model of the design act is incomplete if we do not address what happens to the project's output, once it begins its life in the social world" (FINDELI, 2010, p. 289).

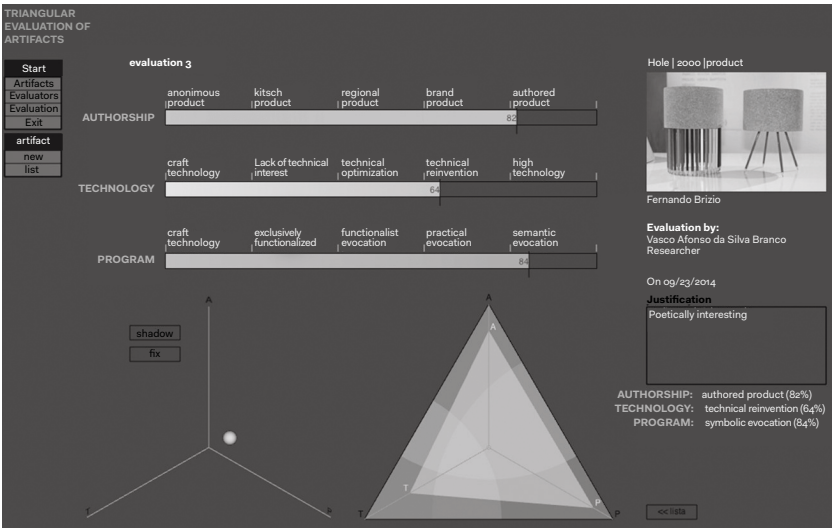


FIGURE 2 – Sinteractive system for the analysis of artifacts by the triangular model. Source: VASCO BRANCO, 2014.

When considering the alignment of the moments of conception and the use of objects in time, we can see their separation by moments of production and their entry into the market. And although the duration of these moments (and even their sequencing[9]) has been altered or "subverted" by the digital tools and artifacts, one can verify the reduction in polysemy that the production imposes on the project and a negative-signal performance, which derives from the market and the uses.

9. Johan Redström (2008), in the article *RE:Definitions of use,* debates the concepts of *'use' before use*, and '*design' after design* opened by the participative practices of design (REDSTRÖM, 2008, p. 421)..

Vial (2014, 2015) proposes a theory of Design Effect, in an attempt to define what Design is from the viewpoint of its "reception". "*Design, within its reception regime, is a 'phenomenon-in-the-world' which is given to our perception and experience in the form of an Effect in our lives"* (VIAL, 2015, p. 45).

This approach – presented as a philosophical manifesto in a treatise format that includes definitions, axioms, hypotheses, and developments, forming a coherent body – is part of the definition of use of an artifact that has been the subject of Design as a living-experience process. This corresponds to a way of acting, feeling and thinking that results from a Design effect.

The effect of Design, which operates in three dimensions, becomes a life experience through *ontofanic* (revelation of being), *calimorphic* (stylistic modeling, aesthetics) and socio-plastic (social modeling) effects. According to the author, this "effect" should not be understood as a consequence of a cause, but as a phenomenological concept, *"[...] effect must be understood here as a phenomenological concept in the sense of the creative outbreak of the apparition, the inventive dynamic of the manifestation, as it structures the experience (correlate of perception*." (VIAL, 2015, p. 43).

If the *ontofania*[10] of the drawn artifacts brings us back to the qualification of the experience they provide, and by which we recognize the intervention of Design, it could not happen without an effect of morphological beauty.

Design means to create forms, but in a style, a specific expression. When there is no drawing, there is no *calimorfia*[11] and so, too, there is no Design effect. The pursuit of beauty is human condition, added pleasure and substitute for the satisfaction of instincts, of which we are often forced to abdicate in real life.

10. From the Greek [*onto-*(on, onthos, present participle of eimi, to be) + *-fáneia* (apparition, manifestation)]

11. From the Greek [*kali-*(beautiful) + *-morfia* (shape)]

The socio-plastic effect of Design derives, in the first instance, from the utility inherent to it, but the forms it creates are agents of civilization.

> *It is generally accepted that the end or purpose of design is to improve or at least maintain the 'habitability' of the world in all its dimensions: physical/material, psychological/cognitive/emotional, spiritual/cultural/symbolic* (FINDELI, 2010, p. 292).

The production of sense or the mediation that things ensure in the relationship between people, between people and the world (VERBEEK, 2005, p. 117) are not explicitly addressed by the author, but appear to be implied in this latter Design effect.

The study of the culture of objects as a network of negotiated meanings (Boradkar, 2010) and of their agency in the relationships in which they participate with people, with other objects, in companies, institutions or events – a central idea to Actor-Network Theory (ANT) – would allow to complete this systemic view of Design.

2.2 A diachronic vision of the last 20 years of design

Francisco Providencia and I (Branco, Providencia, 2017) were recently invited to present our diachronic vision about the last 20 years of Design in this era of globalization. This perspective resulted from the projection of the triangular model on the evolution of Design in its consequent innovation areas: digital technology (experience, interaction), social program (sustainability, ecology) and aesthetic condition (metaphor, poetics).

2.2.1 DESIGN AND DIGITAL TECHNOLOGY

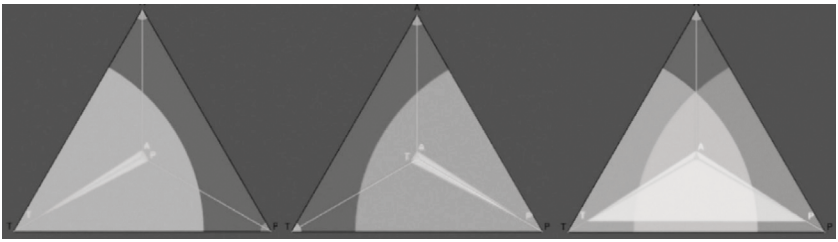
Artificiality is the dominant feature of the world we inhabit, and its invasive and penetrating trajectory has been traced by technological innovation, especially since the advent of *digital material.*

In the last two decades, the world has undergone an extraordinary increase in digital artifacts and services, namely by exploring the new technical paradigm of the internet, stimulating the emergence of a wave of new business, as happened with steam in the 19th century and with electricity in the 20th century.

Looking at the world, we see how digital media Design is hegemonic in its efficiency to change the configuration forces of the world. Design has acquired, through digital means, a new economic and social reputation, consolidated by its viral propagation through the network.

Today there is a complete line of computationally accessible tools, applications, websites and networks that can accompany Design from the conception to the marketing of products, all through financing, production and distribution, invoking the designer under the medieval totality of the craftsman, the entrepreneur. Many of these possibilities are shared open source, open design or creative commons, and are explored in fab labs networks or hackerspaces. Design seems to be able to control the whole process, without the need for intermediaries between an idea and its proposal to the market – manifestation of its freedom of authorship. On the other hand, the proximity to digital begins to permeate Design practice itself with new languages (generative morphogenic grammars) or with new proposals of experience (tangible interfaces).

If we represent this situation from the triangular system that we have developed, we can see that it necessarily implies a very strong technological polarization on any Design (FIG. 3a), orienting and limiting its conceptual space (represented by the inner triangle)



(a) **(b)** **(c)**

FIGURE 3– Triangular model: a) Polarity in high technology; b) Polarity in symbolic evocation; c) Simultaneously high polarities of the technology and program poles. Source: VASCO BRANCO, 2014.

2.2.2 DESIGN AND SOCIAL PROGRAM

At that same time, the proximity of the technically mediated service is confused with the relevance attributed to the social program of accessibility, inclusiveness and universality that the global communication network

has guaranteed to citizens. The urgency of a social innovation, capable of overcoming the weaknesses of democratic states in the face of the economic crisis, the disarticulation of the welfare state and the discovery through Economy of the aptitude of Design's creative methodologies in the service of the "design thinking" innovation management (Tim Brown), are at the base of the growing approximation and interest of the Social Sciences for Design. Design, exploring network connections under the urgency of new paradigms of social organization and the articulation of the different economic, cultural and social agents proposes the realization of a service Design, directed to the management of resources for sustainability.

The theme of social design has become increasingly important, both in academic research and among students, especially motivated by the imperative of creating social and solidarity alternatives of more responsible civil participation, involving utopia, volunteering and activism at the service of the collective benefit[12].

Design's involvement in programmatically oriented actions, such as the cases mentioned above, where social intervention is dominant (MANZINI, 2015a, 2015b), tends to polarize the project towards the symbolic evocation of the values that govern them. Thus, in the triangular system (FIG. 3b), the representation of this situation assumes a figure symmetrical to the one presented for technology.

12. DESIS Network originates from three main international activities in the 2006-2008 period: the European research EMUDE, 2005; the UNEP Program CCSL, 2008 and the international conference "Changing the Change, within the framework of Torino World Design Capital, 2008. [www.desisnetwork.org/about/] Acessed in: 09 Jul. 2017. The Institute for Research in Design, Media and Culture [ID+] at the University of Aveiro integrates one of the 46 laboratories aggregated in this network.

2.2.3 DESIGN AND AESTHETIC CONDITION

A growing involvement of Design by sociology (economics) and technology (engineering) have repositioned Design from its sixteenth-century origin in the Design Academies, and later humanist formation in the Southern Europe schools of Fine Arts, for an organic-functionalist or socio-activist performance, disaggregating it from the metaphorical and aesthetic performance which derives from the artistic culture.

The aesthetic rhetoric of digital products at the service of social functionalization presents an operational similitude that universalizes and normalizes them, inviting Design to contribute more to its technical adequacy than to symbolic communication. In the triadic spectrum of Design, Technological Design seems to forget the genetic relevance of

metaphor, essential in the success of man-machine mediation itself.

When integrated into the service of social activism, Design has been instrumented both to motivate membership and political cohesion of social groups, to visually structure complex services, and to illustrate potential collaborative purposes of territorial appropriateness and technical symbiosis (associating casualties with high technologies), but seeming to ignore the importance of its operative vocation on form, as the content of truth (Theodor Adorno).

Design has lost its cultural origin as a designer, to achieve a more strategic and functional performance, but sacrificing its historical body of experience and knowledge. In doing so is Design to abdicate the impact and existential reflection that was translated in the interpretation of its time, as a contribution to understanding the present and to the invention of the future, anticipating it by the form of its language. The culture of Design owes to metaphor the operative medium with which it imagines and summons what does not yet exist, or transcends the knowledge of its author.

By overlapping the representations of the base polarities presented in the previous two points (FIG. 3c), we can infer that Design solutions, without strong authorial intervention, will refer more explicitly to functional, technical, and ideological logics without the obvious contamination of a sense that values and transcends them. If, as Clive Dilnot (2015) states

> *The underlying historical claim here is that since 1945, and we have been in transition to a world where it is the artificial, and no longer nature, that is (for us) the horizon and medium of the world. Where it is the artificial (and our relations with 'it') that constitutes as the formative totality of existence and thus becomes the prime condition of our existence* (DILNOT, 2015, p. 119).

That is, only the poetics of Design can reconcile its aesthetic and functional functions, documenting the spirit of time and creating new questions to the world.

3 Artificial as horizon

Although written in a conditional form, the previous citation justifies a careful analysis, since what Dilnot affirms is that our experience of the

world is no longer more of the same, even with the use of new technologies, but a condition qualitatively new (DILNOT, 2014, p. 186). A historical condition in which the reach, the ubiquity and the universal dimension of Artificial have opened an insurmountable time, in which Artificial has become the determining condition of the world.

In the article "*Reasons to Be Cheerful, 1, 2, 3 ...* (Or Why the Artificial May Yet Save Us)*", Dilnot systematizes, with three images, his vision on the evolution of our relationship with the artifice.

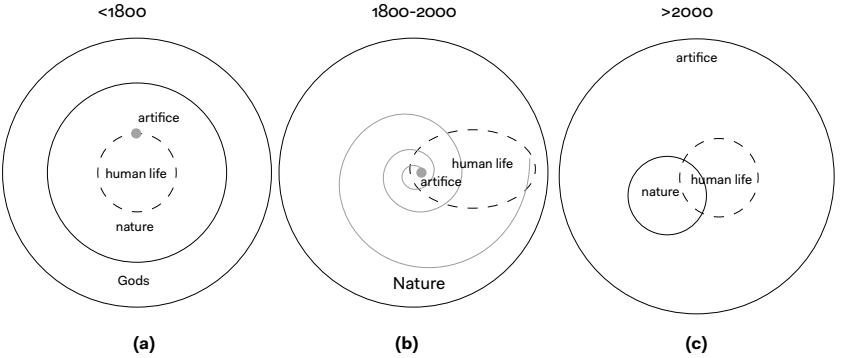


FIGURE 4 – The evolution of the artifice: a) > 1800; b) 1800 - 2000; c) > 2000. Source: DILNOT, 2014.

A quick inspection of these representations allows us to confirm what the author describes: a trajectory of the Artificial (always present and central in the future of humanity) that begins (FIG. 4a) in a limited way and without substantial impact on nature; goes through the period in which the artifice grew logarithmically (FIG. 4b), from the increase of productive capacity brought by the industrial revolution, based on fossil energies and technology, until industrialization becomes global; (FIG. 4c), in which Artificial (not nature) is becoming the horizon and determining condition of the world: its totality (DILNOT, 2014).

This perspective is also expressed with concern by Eduardo Lourenço in a recent interview, when he highlights the affirmative need of the questioning:

> Today we can spend a lifetime watching movies, television or a screen and die without having entered our lives. We are more than perishable, at any moment, but the idea that we can spend most of our life together with interesting things to visit, to get hold of, to interrogate or be questioned... To be morbidly attached to this passion for the image devours us alive (Eduardo Lourenço, interview by Isabel Lucas, Público, 07/31/2017).[13]

13. https://www.publico.pt/2017/07/31/culturaipsilon/noticia/eduardo-lourenco-a-terra-nao-merece-este-genero-de-sonhos-mal-sonhados-1780705. Acessed in: 03 Ago. 2017.

It is appropriate not to confine the artificial in technology, since it extends beyond technical systems to the symbolic, to the human and to Nature itself. Hybridization is the dominant note of contemporaneity.

Matt Ratto (2016), from of the University of Toronto, states radically that it is now completely naive – or potentially criminal – to maintain a belief in the separation of culture and nature, or between society and technology, inquires: "*When we can no longer depend upon the possibility of a return to a homeostatic nature, to a rebalanced Mother Earth; when we can no longer rely on purity at all–what are our options?*" (RATTO, 2016, p. 28).

In the first instance, the answer to this question is to try to understand this new condition of being and to search for the possibilities that open up.

Dilnot (2014) states that the form which the artificial will have by definition is incomplete, and that this will be the political issue for this century, as well as how to deal with an economy where greed and accumulation of wealth by a minority have a destructive power over global hope. Since it is not possible to know the artificial as such, as a delimited body, the author discusses, in the article referred to, seven aspects of the artificial that he considers already visible and that, although they have a hypothetical character, seem relevant for praxis and for research in Design:

1. No law/configuration – in the artificial there are no laws (rules), but configurations. The main condition of the artificial is not what things are, but what things could have been. There are, therefore, instances (the configurations that things take) and possibilities;

2. Proposition – every artifice has the character of a proposition. The configuration in the artificial is always the negotiation of a complex and incommensurable program, which is temporarily resolved in an artifact. Hence, every artifice is an exploration of a possibility and the radical uncertainty of the proposition in which any artifact dwells. But that inscribes a question to the world (which may be explicit);
3. The possible – the artificial has no limits, only possibilities. The artificial is the domain of our possibility and, therefore, possibility becomes the domain of being. We now occupy, objectively, the domain of culture as a possibility;
4. Mediation – all artifacts are essentially mediation: either (a) with humans, to whom the artifacts are irreducibly directed, or (b) with other artifacts and with the physical environment in relation to which, or in the context of which an artifact acts;
5. Negotiation of incommensurability – the complexity of needs, desires or claims impel moments and situations that cannot be measured with resolution in an always incomplete configuration. This incommensurability implies negotiation as an approach that moves away from the determinism and the contextual independence that characterizes (used to characterize?) technology;
6. 'Overcoming' of technology – technology has turned out to be an excess of itself as a concept, and tends to be embodied in the broader notion of the artificial;
7. Ethics – the relevant ethical issues are inferred, in the artificial, from the substitution of the law (rule) for the possible and the primacy of mediation and negotiation. If the Design action focuses on the transformation of an existing situation into a preferred situation (SIMON, 1996), then ethical issues focus on humans as actors and subjects of these situations.

These reflections on some aspects of the artificial, their dual condition of possibility and danger, justify the overwhelming addition of the attention given to Design by its convocation as a methodological tool for deciphering and navigating in this unknown "new", which lacks the configurations to relieve.

Perhaps because of this, Design is more and more a topic. There is an almost omnipresence of the term, even because the expansion of the territory of Design has been another determining aspect of its evolution in the last 20 years.

As Vitor Margolin would say it,

> [...] new forms of design are appearing as rapidly as art movements did in the 1960s", adding that "with the current acceleration of technology, economic activity, political instability and environmental disruption, there is every reason to expect that unprecedented forms of design will continue to emerge as responses to these conditions (MARGOLIN, 2013, p. 402-403).

In this same article, Margolin presents his concerns about what he considers to be a generalized crisis in the field of Design "[...] let us recognize that there is a crisis in the domain of design with its multifarious activities of practice, research, discourse and education." (MARGOLIN, 2013, p. 404).

Margolin sees an ontological crisis in Design, pressed by the constant extension of its territory and by the youthful fragility of the community that investigates and teaches it. But Latour sees "this expansion as a fascinating tell tale of a change of mood, in the ways in which we have come to deal with objects and action more generally" (LATOUR, 2008, p. 2). This author recognizes five advantages to the concept of design (modesty, attention to detail, semiotic skills, always being [re]design and necessarily involving an ethical dimension) to the re (design) of subject-object mediation, which the current moment of the trajectory of artificiality claims by revealing that, after all, "matters of fact have always been matters of concern" (LATOUR, 2008, p. 13)[14].

But this (re) design will only be successful through a Design intervention that poetically articulates its dominant traits:

14. "One way to think this differentiation, or this movement between matter/mattering, is to use Latour's useful little point about the shift in our time from 'Matters of Fact' to 'Matters of Concern.' Philosophically, for us, until very recently indeed, matter, as above all-natural matter, earth-stuff, has meant Fact. In effect, matter was/is equated to 'object' and was/is contrasted to 'subject.' But Mattering, meaning that which matters (to us) is precisely a matter of concern and thus cannot have the quality of a fact. A matter(ing) is not therefore an object. "(DILNOT, 2015, p. 119).

"the modality of the future, the category of possibility and the cognitive discourse of anticipation" (LISBOA, 2004, p. 6). And anticipation is symbolically structuring of utopia.[15]

15. Alfredo Bosi wrote: "In the hypothesis of the great Hegelian and Marxist thinker Ernst Bloch, it is the anticipation that produces the symbolic structure of utopia at any time".

3.1 Design education

The importance of the sense of possibility in the set of skills that make up the ability to design is presented by Löwgren, Stolterman (2007), from a quote to Robert Musil's novel *The Man without Qualities* (1943. p. 10-11).

> But if there is a sense of reality, and no one will doubt it has its justification for existing, then there must also be something we can call a sense of possibility [...]. Therefore, the sense of possibility has to be defined outright as the ability to conceive of everything there might be just as well, and to attach no more importance to what is than to what is not.

Futurologist Stuart Candy[16] considers that the possibility (as future) inscribes the plausible, the probable and the preferable, the latter at the intersection between the two previous ones, as can be seen in FIG. 5a, by Dunne and Raby (2013, p. 5). The names are self-explanatory on the concepts in question

16. www.situationlab.org/about/ (consultado em 06/09/2017).

The field of 'probable' generally guides the practice of Design (FIG. 5b), and its education, and the 'plausible' can justify the cautious exploration of alternative futures (DUNNE; RABY, 2013, p. 4). Herbert Simon (1996) in his definition of the discipline, emphasized the preferable as a 'space' of action for Design[17].

17. "To design is to devise courses of action aimed at changing existing situations into preferred ones". (SIMON, 1996, p. 111).

For Dunne and Raby, proponents of Critical Design, the 'possibility' is the space of speculative culture. The idea of possible futures is used to understand the present and to debate, based on "necessarily provocative, intentionally simplified and fictional" scenarios.

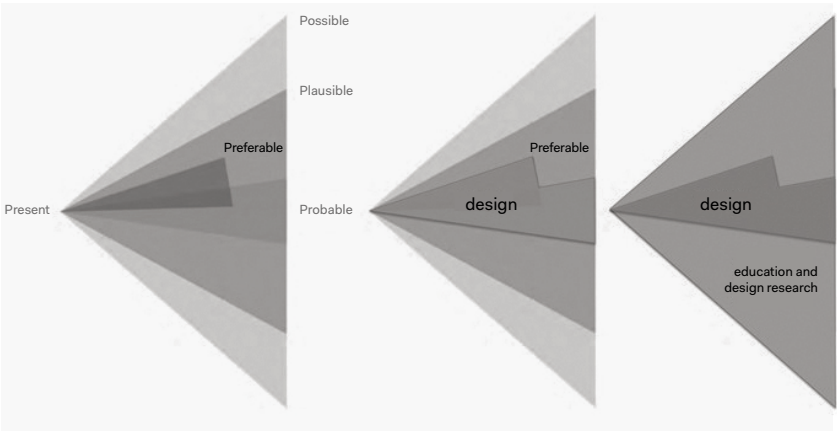


FIGURE 5 – a) PPPP; b) PPPP/design relation; c) the 'possible' in education and investigation in Design. Source: FABY DUNNE, 2013.

If we agree that the sense of possibility is indispensable to Design, that it articulates with the sense of reality in each project context, and that it is the poetic agency of the author that qualifies this mediation, then we can draw some conclusions for the education of designers:

- the *first* one is that the teaching process of future designers will have to continue to ensure and reinforce the individualized configuration of learning. Assuming the centrality of the project disciplines in the training of each student in the reflection-in-action process (SCHÖN, 1983), where different skills and acquired knowledge progressively integrate, it is also important to envisage other formations, other than Design, that prepare the students to work in the context of the broad and complex contemporary culture.
- the *second* one is inferred from the need to investigate futures and will imply in the students' involvement in the response to speculative and fictional scenarios (as well as their construction), complementary to the Design process (FIG. 5c).
- the *third* one relates to students' analytical and critical training on what exists or what is anticipated. It is imperative to give prominence to the tasks - which should continue throughout their lives – that enable them to assess their capacity for critic judgment and,

autonomously, to build their own set of values. In this sense, it is fundamental to study existing artifacts that reflect in a different way the valorization of the qualities that are recognized in them. But each artifact brings with it the context of forces and circumstances in which it was conceived. Design is a situated action, never happening out of history (DILNOT, 2015, p. 115). The history of Design earns, therefore, a determining role in the formation of a designer.

- the *fourth* one is based on the need to transform visions of the future into operative images in the present, as tools for developing and communicating the creative process, and should be translated into a reinforcement of drawing and prototyping skills. Contrary to Buchanan (2004, p. 36), I still consider that drawing is not just representation and that form is determinant in the *raison d'être* of Design.

The creative process in the project, as construction of a cognitive discourse of anticipation, can be verified by observing the succession of moments that compose it: advances and retreats, alternation between abstraction and concretization, between holistic notion and detail. A Brownian movement, without certain cadence, that is morphing a vision into a possibility and a possibility into a contingent conviction. Each iteration should be clarifying because each assessment is likely to be a new start, now more informed. And although the dilemma (but also the essence) of this process may be in its control, it does not seem possible to prescribe a methodological primer that guarantees *a priori* the success of this course. The methods, the principles or heuristics must be used by designers and also in their education, without algorithmic comfort.

3.3 Design research

This need for continued reflection on what it does and on the Other, which must transcend and contaminate reflection-in-action (the project) can only be effectively satisfied with access to shared knowledge about Design and with world-living.

Each designer accumulates, throughout their professional life, a wealth of experience, knowledge and tools that guarantee a way of operating in the concession of artifacts. Societally, the set of designers

and stakeholders that relate to Design constitute an ecosystem that generates and disseminates a culture proper to the discipline. Another important source of knowledge production on Design is Design research. This knowledge is expected to be 'new' and useful to Designers.

Manzini (2015a, p. 38) systematizes globally the production and transfer of knowledge about Design from two modalities:

- Research-in-design[18], that is, the very propositional essence of the project about complex situations, gives it the characteristics of an exploratory process, but "does not deal exhaustively with the question of the relation between Design and research";
- research-on-design, considered by the author as a form of Design, whose purpose is the production of knowledge about Design.

18. The hyphenation in this term is my responsibility to make the vision of Ezio Manzini identifiable within the framework of what has been the long-winded debate about the ontology of Design research.

The justification for this duality, according to this author, is, on the one hand, with the increasing dimension and complexity of the problems, which makes Design teams incapable of producing (usually) all the knowledge required for their solution when working in the traditional modality (design-as-research); on the other hand, it derives from the changes that have been made in the Design process due to the global connectivity that now tends to be distributed by numerous actors, differentiated in culture, professional development and motivations. "Traditional design knowledge, accumulated within the implicit knowledge of design experts, is no longer enough: too many subjects are involved and too many of them are not in the same place" (MANZINI, 2015a, p. 39).

Manzini concludes that research-on-design should produce explicit, debatable, transferable and assimilable knowledge as a starting point for its growth and use. Another important aspect is the need to develop a repertoire with this knowledge about Design.

It is curious that the author defines two modalities of doing research – one exploratory, genetically associated with the project, and another "more canonical", recognizable by scientific standards – which are also Design. This apparent contradiction – as I recognize it – is essential to reconcile its view of Design research with the Design ontology it proposes (MANZINI, 2015a, p. 53). For Manzini this activity (and therefore any design

solution) lies on a surface defined by two orthogonal axes "designing" – which varies between polarities: problem solving and production of meaning – and "being a designer" – which varies between the diffuse Design, anthropological capacity, and the specialized Design, capacity developed by professionals.

If we compare this organization of Design research with the proposal by Christopher Frayling (1993), it is easily verifiable that although both predict three categories, only the research *through* Design is identical in designation and scope.

In describing research *through* Design (RtD), the author admits levels of subjective contamination (copyright?) That distance it from the scientific tradition:

> Research through design necessarily brings into play a level of subjectivity that would be inadmissible in the scientific tradition. Nevertheless, this is not typical "artistic research," totally guided by the subjective dimension (MANZINI, 2015a, p. 39).

But he is careful in isolating the investigation *through* the Design of the artistic field, also reinforcing the "obligatoriness" of the results not being implicit and integrated in an artifact.

I do not share this point of view of Ezio Manzini, although I also consider that Design research should produce new knowledge about the discipline that is useful for those who practice it professionally and consider the existence of a repository of shared knowledge easily accessible.

If we believe that the artificial is our horizon, becoming the essential condition of our existence, and if we recover the aspects of the artificial that Dilnot (2014) thematizes - namely with regard to its propositional character, where mediation and negotiation are configurative in the face of incommensurability, of the absence of law and of the strict limits of possibility – after that, we will be able to deduce that, in order to investigate this new human condition, law (the scientific tradition) will not be determinant in proposing configurations, their instantiation.

On the other hand, Design, and the theories it promotes, have a provisional, contingent and aspirational nature (GAVER, 2012) and its practice is generative of configurations. Artifacts tend, through the action of Design, to be materializations of reified theories or philosophies (VIAL, 2013a).

*The implicit theories embodied in objects, from this perspective, range from the philosophical (what values should designs serve?) to the functional (how those values should be achieved in interaction) to the social (what will the people who use this be like?) to the aesthetic (what form and appearance is appropriate for the context?). Moreover, artefacts do not address these issues analytically, but represent the designer's best judgement about how to address the particular configuration of issues in question (*GAVER, 2012, p. 944).

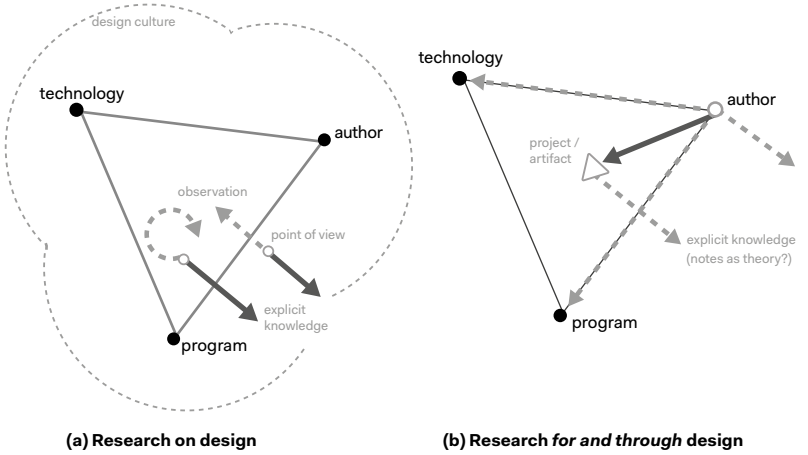


FIGURE 6 – Relationship between the triangular model and the research categories according to Frayling: (a) research about Design; (b) research for and through Design. Source: VASCO BRANCO, 2014.

Therefore, I would say that, in order to investigate the artificial, it is necessary to delineate it and to follow the course of the proposed configurations. The future of the artificial will depend on the attitudes and values that the configurations mediate. So, it is important to emphasize the authorial dimension in Design research through the inclusion of project development in its methodological trajectory.

It does not seem to me necessary to revise Frayling's taxonomy to accommodate my point of view, but it is important to note the relation between each of them and the project (FIG. 6).

Fatina Saikaly (2005) studied thirteen doctoral research projects in this situation and concluded that "the main aspects of the practice-based approach to design research are leading towards to the definition of

a designerly way of researching." releasing the abductive condition of the project in the approach to research in this field. Gaver (2012, p. 44) proposes the annotation in order to make explicit the produced knowledge that is implicit in an artifact. These initiatives demonstrate the possibility of transforming design-as-research into research *through* Design, facilitating the bridges between the professional project activity and academia.

I conclude that they become decisive research efforts that do not diminish their authorial dimension, promoting new balances of the three polarities to ensure "the encounter between ethics and aesthetics of design in a single movement of freedom that will promote the humanization of the artificial" (adapted from PROVIDENCIA, 2012).

> I suggest that the design research community should be wary of impulses towards convergence and standardization, and instead take pride in its aptitude for exploring and speculating, particularizing and diversifying, and – especially – its ability to manifest the results in the form of new, conceptually rich artefacts (GAVER, 2012, p. 937).

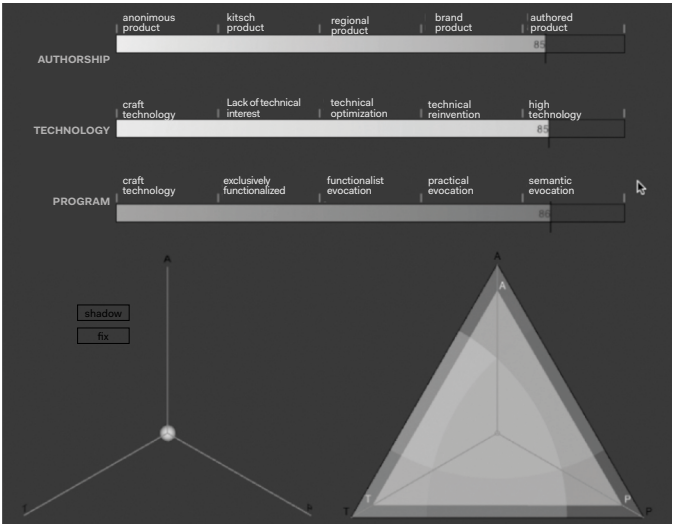


FIGURE 7 – Triangular model. Polarities balanced among the three vertices. Source: VASCO BRANCO, 2014.

The translation of this authorial intervention can be verified in the image of the triangular model (FIG. 7), where the increase of the respective polarity results in more balanced results with an increased production of meaning.

19. "These two properties of the idea are in inverse ratio to each other: the greater the comprehension of an idea, the less its extension, and vice versa." (www3.nd.edu/~maritain/jmc/etext/logic-18.htm, Acessed in: 06 Set. 2017).

4 Conclusion

To conclude, I summarize the main lines of thought I have presented in this lesson:

1 [EXTENSION]
The increasing horizontal extension of Design (extension of the field) and also vertical (deepening as a generalizable form of approach to the problems) is observed, leading to the reduction of its understanding[19].

2 [ONTOLOGY]
Conceptually bypassing Design, we increase its understanding: not to build walls, but to have a navigational instrument that guides perspectives, choices, and therefore values.

> **[ACTIVITY]**
> "Design is the outline of artifacts, devices and cultural mediation services" (PROVIDENCIA, 2012, p. 53).
>
> **[ARTIFACT]**
> it results from a "project" incidence, conditioned to three common denominators: an author (a manager/center of individual or collective coherence), a program (response to a stated need), and technology (operational and material medium of its construction)."
>
> **[PROJECT]**
> "The triangular structure links the technical relationship (program + technology) with the cultural and humanistic interaction of the program interpretation from the existential experience itself (author + program) and the aesthetic evocation in the construction of an artistic language (author + technology)." (PROVIDENCIA, 2012, p. 83).

3 **[CONTEMPORANEITY]**
The analysis of Contemporary Design, based on the triangular model, allows us to recognize a remarkable level of polarization, both by technological innovation and by the symbolic pressure of strongly ideological programs. Both polarities define their own ontological traces for the activity/discipline, widening the territory and generating contradictory signals and requests on the designers, which can lead to paradoxical decision-making (Sophie's choices?).

4 [THE ARTIFICIAL]
It was assumed that the artificial is increasingly the horizon and the new human condition and that Design, in all its plasticity, is geared towards its mediation and configuration. The artificial will depend on the values, but also (and therefore?) of the ontological contours which guide the configurations.

5 [EDUCATION]
The education of designers must be situated, that is, attend to the corpotate signals sent by the local and global contexts where their professional activity will take place and be recognized in History, the possibility of reference in time.
All the ontologies of the Design must be debated and, possibly, backdropped like basic polarities for the exercise of the project.
But it will be increasingly important to develop pedagogical approaches that promote the speculative spirit and the critical and poetic capacities in algorithmic frameworks of low algorithmic comfort based on drawing and doing (prototyping).

6 [RESEARCH]
In order to make research more impactful in the profession and in the corporate fabrics, it is necessary to focus on the credibility of the project practice as a methodological instrument, as well as the authorial interpretation and responsibility in the conduct of the process.
The academic status of Design research allows it to "anticipate utopias" by exploring other possible scenarios, not necessarily probable yet feasible.
It remains necessary to repeat that the evaluation of the quality of Design research, having the scientific article as a central (and almost unique)

unit of measure, distances designers/ researchers/ professors from their rationale or at least their reason to do.

7 [POETIC ACTIVISM]

Even accepting, by the evidence, the artificial as horizon and the hybridization as 'natural' (as Latour, Dilnot and others have been demonstrating) and the consequent devaluation of the subject/object division (which justifies Design as an economic activity) "the invention of a design for freedom, which reconciles man with his own desire" seems to remain necessary (PROVIDENCIA, 2012, p. 137).

If we cross this perspective with the discourse of António Damásio (DAMÁSIO; DAMÁSIO, 2006), at the opening session of the World Conference on Arts Education promoted by UNESCO in Lisbon in 2006, we confirm that the artistic dimension – authorial –, is not dispensable in any Ontology of Design, since its intervention can inscribe (or it should inscribe) the reflection and the emotion that lead to the appreciation of the indispensable social values: "[...] *arts and humanities education can convey the moral structure that is required for a healthy society and is so challenged by current social developments. And third: arts and humanities education actually fosters the imagination that is necessary for innovation*" (DAMÁSIO; DAMÁSIO, 2006, p. 14-15).

Poetic activism in Design must, therefore, mediate our new condition as hybrids, taking care, to the limit, of the humanity it contains through the "design of desire" (PROVIDENCIA, 2012, p. 137), merging ethics and aesthetics into the experience of things as causes.

> But so is all life; so at least it is that system of private life which is generally called civilization. Civilization consists in giving anything a name that does not belong to it, and then dreaming about the result. And the false name and the true dream actually create a new reality. The object actually becomes another because we make it another. We manufacture realities. The raw material remains the same, but the form, which art has given it, effectively distances it from being the same. A pine table is pine, but it is also table. We sit by the table and not by the pine tree (FERNANDO PESSOA, 2014, p. 357).

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