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Design beyond the human world of management and organization: Towards a cosmology for the Anthropocene

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Abstract: In this paper, we intend to make explicit the shared ontological foundation of design and management and question them in light of the advent of the Anthropocene. To do so, we first draw these disciplines closer before qualifying their common ground as an underlying "cosmology they share". This cosmology is characterized by the centrality of the notion of organization. We argue that design as well as design knowledge must be assessed with regards to this peculiar cosmology. We call for the need to go beyond what we call the "monism of organizations" or the "organized world". We propose a new direction for design oriented equally a) toward the organized world, setting the task to suitably deconstruct it or properly shut it down, and b) towards the Earth itself, in search of a new, more adequate cosmology and more sustain-able forms of life rather than trying to hubristically improve the habitability of the world.

Keywords: Anthropocene; cosmology; design; organization

1. Introduction

In this paper, we intend to make explicit the shared ontological foundation of design and management and question this foundation in light of the advent of the Anthropocene. To do so, we first draw these disciplines closer before qualifying their common ground as an underlying "cosmology they share". Grounded in modern anthropology, "cosmology" as we define it reflects a particular commitment to the world. It may thus concern the epistemic background of a discipline (e.g., design, management) or the ontological worldview and practices of a community (be it a social group, a firm, a band, or an indigenous community, etc.). So viewed, cosmology is closely tied to the activity of naming, partitioning and classifying the world (singular) and the entities it comprises, following patterns defined by each community over the course of their history, thus disclosing new worlds (plural), that is to say, new assemblages of entities with different boundaries irreducible to one another.

Our world is thus, without any contradiction, a world of many worlds (De la Cadena & Blaser, 2018; Escobar, 2018) — or as the late Mary Midgley (1996) once jokingly wrote, "one world, but a big one"). Of course, this worlding activity has direct consequences on how groups are going to perceive, conceive and perform the world, nature, other humans and non-humans (artefacts, animals, organizations, fictional entities, etc.). Such a cosmological commitment is then expressed in situated and perspectival knowledges (Haraway, 1988).

This cosmology shared by design and management is characterized by the centrality of the notion of organization which we criticize calling for the need to go beyond what we call the "human world of organizations" or the "organized world"—a monism found at the root of artificial sciences that needs surpassing. We confront the cosmology of design and management with some of the transformations brought about by the emergence of the Anthropocene. In fact, we suggest that this implicit cosmology is strongly challenged by the advent of the Anthropocene. We propose a new direction for design oriented equally a) toward the organized world, setting the task to suitably deconstruct it or properly shut it down, and b) towards the Earth itself, in search of a new, more adequate cosmology and more sustain-able forms of life rather than trying to hubristically improve the habitability of the world.

2. Pars destruens: The expansion of the artificial and the human world of organizations

In a movement of emancipation from industrial design and the quest for epistemological autonomy, design research has sometimes been defined, in particular by Alain Findeli (2010, p. 294), as "a systematic search for and acquisition of knowledge related to general human ecology considered from a designerly way of thinking, i.e. a project-oriented perspective." It then sets itself the goal of "improving or at least maintaining the "habitability" of the world in all its dimensions: physical / material, psychological / cognitive / emotional, spiritual / cultural /symbolic." (Findelli, 2010, p. 292). Habitability is defined, in turn, as the "interface and interactions between individual or collective 'inhabitants' of the world (i.e. all of us human beings) and the world in which we live (i.e. our natural and artificial environments [...])" (Findeli, 2010, p. 292). In this sense, from the point of view of design, "the world is a project to be realized and not only an object to be described and understood" (Findeli, 2006, p. 23). So viewed, design projects human intentions aimed at "improving" the lives of people (or "users" as they are often called) as they relate to products, services, and spaces, bringing design knowledge to bear on a "world to be perfected" (Findeli, 2006, p. 23).

This posture is more generally predicated on an understanding of design as a "science of the artificial" concerned not with description but with prescription, not with the necessary but with the contingent, not with how things are but with how they might be, as famously proposed by Herbert Simon (1969). Such an understanding distinguishes design from all the natural and social sciences, enforcing a profound division between the artificial and the natural. Early foundational debates in the field of design studies featured a plethora of

contrasting definitions and philosophies of design, yet converged on this Simonian partition and conception of the artificial (Buchanan, 1992). Design has thus typically been underpinned by an avowed instrumental reason to shape the contingent features of "the artificial" in order to improve the habitability of the world, with the "natural" as a stable backdrop from which resources are drawn and adapted to human goals and purposes. It is only in the wake of a rising ecological awareness in design discourse that this modern relation of design to the natural has been called into question — most commonly from an ethical perspective and less so from an ontological one (for a classic example, see Papanek, 1984).

Arguably, the assumed ontological separation between the natural and the artificial sketched by Simon (1969) remains widespread as part of the ongoing legacy of his work in design theory (Huppatz, 2015). Even those efforts aimed at problematizing the category of Nature in light of the ecological crisis seem to construct a mirror image in an enlarged notion of Artifice as an "unsurpassable condition" (Dilnot, 2021) from which there is no outside anymore. Here an inversion is operated wherein nature is denaturalized and artificiality naturalized (Fry, 1995). At any rate, whether conceived of as a clearly-bounded realm against the backdrop of a stable nature or as a boundless condition of totality mediating all existence, artificiality remains broadly understood in a Simonian sense as the enlarged one-world resulting from acts of making carried out by human beings in their effort to bring order to an otherwise disordered world with the aim of enhancing human existence. Granted, there are more and more alternative design perspectives and practices that question this assumption (Tironi & Hermansen, 2018; Escobar, 2018; Forlano, 2017; Schmeer, 2019; Tonkinwise, 2006), incorporating insights from STS and 'other-than-human' strands in anthropology which decenter the human and foreground the plurality of agencies involved in processes of worldmaking. In spite of these encouraging developments, much of the design discipline as currently practiced and taught still rests on a "one-world metaphysics" (Law, 2015).

The idea of a "single container world" (Law, 2015) that defines this one-world cosmology or metaphysics is inextricable from the aspiration for a *single* order (Law, 1994) — an aspiration which permeated and characterized the projects of modernization and globalization and which, to varying degrees, remains implicit in corrective efforts and initiatives associated with notions such as 'social design' (von Busch & Palmås, 2016; Julier & Kimbell, 2019) or 'responsible innovation' (Frahm, Doezema & Pfotenhauer, 2022). John Law (1994, p. 2) aptly refers to this aspiration as "the dream, or the nightmare, of modernity" — one that is predicated on the assumption that if we build a thoroughly artificial world then it is possible to achieve order, it is possible to manage and organize our otherwise disorganized and chaotic world. So viewed, one could argue that the increasing convergence of design and management in contemporary economic and organizational life (Reckwitz, 2017) is symptomatic of this tight link between an expanding artificiality and the idea of order at the heart of the one-world cosmology. Indeed, this confluence can be seen as the simultaneous unfolding of the managerialization of design and the designification of management, as

evidenced in the massive interest and uptake of design approaches and practices in the organizational world beyond traditional design industries (Julier, 2017; Valtonen, 2020) and the increasing pressure to manage and 'prove' the value of design practice by means of managerialist instruments and assessments (Navarro Aguiar, 2020). This rapprochement between design and management was in some sense prefigured by Simon (1969), but is also quintessentially manifest in the work of design theorist Richard Buchanan, who views the design discipline as fundamentally "a humanistic enterprise" (Buchanan, 1995). In his influential matrix of the Four Orders of Design (see Buchanan, 1992), he outlines the expanding trajectory of design from a professional practice initially concerned with the design of visual communications (first order) and industrial goods (second order) to one increasingly concerned with the design of services and processes (third order) as well as systems and organizations (fourth order). The fourth order, Buchanan (2015) argued more recently, "is the hallmark of the current design movement" (p. 5) in which "*management* has become a logical extension of the new design thinking" (p. 11, emphasis in the original). The Four Orders framework thus clearly delineates the convergent trajectory of design and management, wherein management effectively becomes a design discipline. Managers, Buchanan (2015, p. 12) argues, "are responsible for designing the worlds we make in organizations and for the worlds that organizations make for others in the social life around us." Here organizations and those that manage them are identified as prime world-makers. In this sense, designers and managers, in their own particular ways and within different orders, "create the environments" that we inhabit, including visual communication, material artefacts, services, and organizations (Buchanan, 2015, p. 18). This expanding collective artifice is the one-world of the artificial, with design and management figuring as the projective agencies underlying its construction and organization.

The convergence between design and management as key disciplines engaged in the projecting, planning and shaping of the artificial (one-)world is both epistemological and ontological in that both disciplines are fundamentally concerned with invention by way of world-making. From this perspective, their epistemic vocation as sciences of the artificial is one and the same: to design and organize a "one-world world" (Law, 2015). In this sense, design and management, as generally practiced and taught, tend to share a common anthropocentric ground, becoming epistemic translations of the world, instrumental in meeting the challenge of innovating and improving the world. Thus performed, the world is fairly homogeneous, essentially constituted and captured by entities such as organizations, agential powers such as organizing and designing, and organizational actors such as managers and designers. From this angle, Artifice does not quite correlate with notions of Society or Culture as traditionally conceived in modernistic dualism, but rather with the more narrow notion of Organization. It is our contention that the undoing of anthropocentric design passes by an undoing of the one-world of management and organization (what we call the organized world) and their underlying cosmology of projection.

3. Pars construens: Alternatives for design

3.1 The problem of the climatic inscription of design

Design latently bears a cosmic inscription, which makes the designer a builder or, at the very least, a being with a strong agency. Yet, creation, invention, planning, design, innovation are collectively regimes of action and projection closely linked to the climate that makes them sometimes imaginable, sometimes achievable. Design cannot be durably extracted from a relationship with the Earth (beyond the "environment"), whether climatic, oceanographic, geomorphological or more broadly cosmological. This relationship that precedes and determines the discipline of design requires not only an acknowledgment of the "unconstructable part of the world", to use Neyrat's (2018) term, but also the enactment of a deconstructable function for design in a damaged, diminished world engaged in a climate trajectory that is unstable, to say the least.

In a non-regulated climate regime, design opens onto many additional worlds (Spinosa, Flores & Dreyfus, 1999), multiplying artifacts, concepts, and planes. One could even say that design engages the world, opening and following certain paths to the benefit and detriment of others. Current ecological and climatic diagnoses question design's relationship to the world as evidenced by a large number of recent manifestos (McDonough & Braungart, 2013; Hanna, Auger & Encinas, 2017), which tend to diverge from a more radical Papanekian tradition. The strategies prioritized here are aimed at taming some of design's "externalities" by integrating a whole series of so-called "environmental" constraints (sustainable or circular design). In other cases, design will try to take over the world or make certain entities "sustainable" through a repertoire of tangible actions such as maintenance, repair, or restoration.

In the end, everything is done to indicate that a systematic recovery of the world is still possible. Placed upstream of a world that is being made, design becomes projector, imperial, conquistador (Maldonado-Torres, 2007). Placed downstream, it would act as a corrector, a benefactor, a civilizer, still controlling the trajectory of an ecologically damaged world. Worse, in a false synchronicity, design, with its "both/and" pretensions (keeping the pace of innovation plus saving the planet), multiplies the futures while avoiding the necessary trade-offs. However, design must be accountable for how it is synchronized with the Earth's ecological, climatic and geological trajectory. As a general rule, the Anthropocene requires all project disciplines (design, management, engineering) to be radically synchronized with geological time, the climate regime or the state of ecological systems in the process of being built or dismantled. The Anthropocene thus considerably disrupts the coordinates of possible action, suggesting the increasingly probable horizon of a forceful climate shift, the advent of cumulative, irreversible processes or even a discontinuity in certain biophysical processes. Under this regime, it is no longer a question of managing or organizing a "complex," uncertain or risky world.

While the emphasis on complexity should more accurately reflect the condition of the world (in particular by contributing to the decentralization of *Anthropos*), it often partakes in reductionism, a new form of cybernetic control that reduces the world to a regime of indeterminacy, making any project, whether it is redevelopment, projection, construction, repair or geoengineering, possible. The entities of the world are then reduced to passive positions, waiting for human intervention to unravel, activate or intensify them. This operation is at the core of the political options that are currently taking shape in the face of the Anthropocene. And is directly related to what we have demonstrated above concerning the one-world cosmology underlying design and management. If the common epistemic root of design and management is related to a particular anthropology of projection, if their common goal is to bring order to a disordered world, then an ecological and cosmological event of the magnitude of the Anthropocene appears as a problem to solve. Here, to design or to manage boils down to reestablishing order by providing "fixes" for cosmological irregularities (which are multiple: ecological crisis, CO2 emissions, biodiversity losses, …). This form of problem solving may indeed recognize the uncertainties of action as it happens in networks of humans and non-humans, but it cannot help but place the human agent at the center of strategic action, bound as it is by an anthropocentric cosmology that upholds the organized (one-)world as ultimate. These cosmological irregularities are instantly translated in an ontological continuum where entities are reduced to passive and substitutable roles. Passive because we need this passivity to assemble and correct cosmological irregularities. Substitutable because we need to trade, negotiate the positions of entities in the world. Both attributes are the epistemic axioms that are needed in order to build strategies of maintenance, compensation, neutralization, and so on, which are the basic political and technical options being shuffled around in attempts to "solve" the ecological crisis. The closer the world comes to complexity, the more its purely earthly character moves away: the system is always a projection, devoid of the ontological character of the non-projected thing.

3.2 A world to "de-project"

The cosmological assumptions of design outlined above may, however, appear to be a possible response to the "cosmological mutation" associated with the Anthropocene: in other words, to the imperative of "making world" when "the" world takes the form of an undetermined situation. However, we propose a cosmological alternative to rethink design in the Anthropocene. Leaving aside the world of "the project", a world to be projected in order to make it human or habitable (by and for humans), let us consider the omen of a world to be "de-projected".

The modern notion of the project does not only designate the coordinated set of actions which materialize an intention or an anticipation: the desire to bring into existence a not-yet-existing reality to which individuals or collectives aspire. As Boutinet (1990) points out:

> "the project appears to us as a figure referring to a paradigm symbolizing a reality that seems to pre-exist and escape us: that of a capacity to create, of a change to operate.

> The project would then be the individual and collective avatar of a primitive desire of appropriation." (p.7)

The project is thus a paradoxical cosmological figure, that of a world of which it is question of destroying and repairing, that of an order of which it is question of disclaiming to make a more preferable and desirable one come about. The project thus operates against the backdrop of a perpetually insufficient and deficient reality that calls for constant renewal, as if disavowing an undesirable inheritance again and again.

As previously noted, certain engaged streams of design literature have questioned these cosmological assumptions, not least based on the observation of their destructive impact on daily life. Already in the 1970s, Alessandro Mendini noted a saturation of projects, leading to a "new nature of the planet" in relation to which it was already a question of "de-projecting the world" (Mendini, 2014). Starting from such a proposal, we can sketch alternative ways of designing within planetary boundaries, taking note of known impossibilities that require us to grasp what "the very consistency of this world must be so that it can include mankind at the same time as other beings" (Montebello, 2015, p. 7; our translation).

It is therefore an alternative cosmology that we are calling for, where the world goes beyond the simple projection, "the mirror or double of man" (Montebello, 2015, p. 7), but develops relationships of consistency between the different beings that compose it and allow it to hold. Design that takes these relationships into account cannot reduce the "ecological" criteria of the world's habitability to those of the human (one-)world alone. The world we thought we were living in and organizing was actually a defected world; its one-worldness was always a partial enactment that conveniently stowed away its pluriversal or "fractiversal" character (Law, 2015). The paradox is that this one-world world, however partial or defected it may be, has nevertheless been projected and forced into existence in recent history. That is why it is wavering now. Therefore, the one-world cosmology is *acosmic*, that is, truly "without a world". The Anthropocene, the very ambiguity of the term attesting to this, now marks the gap between this "acosmic forcing", which we inherit through a development of nearly three centuries, and the need to fund a different cosmological dimension.

3.3 The unconstructable and deconstructable part of design

Two dimensions emerge from the above considerations: unconstructability and deconstructability, which are emerging as potential avenues for design: an intrinsically non-reductionist approach, deeply rooted in planetary limits on the one hand, and a design of destauration on the other. In a recent article, a group of geologists estimated the weight of the Technosphere (infrastructures, technical artifacts, objects, industrial systems, etc.) to be five times that of the human biosphere (Zalasiewicz et al., 2017). More than highlighting the undeniable responsibility of design (as a professional discipline and practice) in the advent of a constructivism that has become geologically measurable, the matter at hand is to rethink

design's orientation and transform it into a method for aligning the Technosphere to the planetary limits and helping the latter to properly "land" (Latour, 2018).

In the following table, we have purported to summarize the different political and methodological options that can be imagined once the "constructive" cosmology has been forsaken. In particular, we try to identify the differences between constructability, unconstructability and deconstructabality with the help of some cosmological parameters previously highlighted in this paper. The first of these parameters concerns the relationship between monistic and pluralist representations of the world and the particular ontological characterization of the entities composing it. Unconstructability, in this sense, is a cosmological direction devoted to keeping the pluriverse open, rejecting reductionism, where, by contrast, deconstruction is the art of closing the Technosphere or the organized world — of getting one's hands dirty as it were, in order to weaken reductionist (de-reductionist) and acosmic operations. Such operations that are not only theoretical but have a very concrete material weight and as such constitute a threat to the current conditions of habitability on the Earth. To this end, unconstructability attempts to keep territories, communities and worlds away from the ontological aggressions of monist operations. The mode of projection of deconstructability is to deconstruct, close and deproject the materiality left behind by the organized world. This deconstructable function is akin to the notion of "elimination design" (Fry, 2005), but eliminating the unsustainable is often too abstract a design task. It is our contention that deconstructability passes by first *inheriting* what must be eliminated (Bonnet, Landivar & Monnin, 2021). Finally, each of these directions leads to action perspectives for design, through differentiated methods and modes of knowledge production.

In the unconstructability/deconstructability columns, the most obvious and natural reaction is to align design within planetary boundaries (or help it to "land", in Latourian terms). With regard to the path of unconstructability, this involves imagining new regulatory barricades, whether legal or political. Design would then be guided by an alignment that would put Earth and life sciences, as well as local environments that face the direct impact of ecological collapse, at the heart of design schools. However, the effort is not limited to the latter; engineering and management schools are also concerned. We therefore could envision "disincubators" where Earth-system specialists but also researchers and lay people directly involved with the ongoing ecological collapse would judge projects to determine their ability to find a place in a truly habitable world— to avoid, in other words, the forcing of the possible that ultimately imposes itself as a forcing of the world itself.

With the third column (deconstructability), the goal is to imagine a design that will inherit the organized world, the world born of development and hyper-growth, and be required to undo (or disassemble) it. Design is part of the programming or planning of the obsolescence of certain infrastructures or technological lineage incompatible with the Anthropocene, what we call "negative commons" (Monnin, 2021). Its aim is to develop protocols of renunciation, a method of unloading the Technosphere of capitalism — or the processes

that maintain it, whether industrial, organizational or informational, which should be equally democratic and technical. Design could also play a different kind of creative role, contributing to the decommissioning and reallocating of the negative legacy of the organized world, inspired by reverse engineering and adapted to the Anthropocene. Reverse design is all about probing, locating, describing or mapping the networks that support the infrastructures of capitalism in order to optimize their disuse/reuse.

Table 1. Cosmologies of design.

	Constructability	**Unconstructability**	**Deconstructability**
Relation to monism	Monistic, reductionist, acosmic	Keeping the possibilities of pluriverse Non reductionist	Deconstruction of monistic ontologies De-reductionist
Ontological entities	Organizations, artifacts, projects, knowledges	A World of many Worlds	A World to disassemble
Mode of projection	Projection: Opening, making and performing worlds	Keeping territories outside of the dominion of projection, design, engineering, management, knowledge. Constraining the production of new worlds.	De-projection, Closing Worlds
Methods			
Mode of world production	Intensive innovation	Renouncement of obsolete futures	Closing activity, dismantling
View of knowledge(s)	Knowledge is seen as an organizing process (knowledge economy, knowledge-intensive production) which contributes to the production of modernity	Knowledges are multiple and based on different rationalities and materialities	Knowledge as destauration, a form of careful relinquishing and discontinuing

This deconstructive aspect should also rely on the "destaurating" side of actor-network theory (ANT). As a counterpoint to ANT, an approach originally mobilized to study innovation as it occurs, a "dark ANT" would be less inclined to favor innovation and help to apprehend deeply problematic anthropocenic contexts. Intended to probe into the infrastructures that generate worlds in the process of disintegration or unraveling, this dark ANT would take on the task of mapping ruins of capitalism — whether picturesque, hidden, operating or decommissioned. The pragmatism underlying ANT approaches calls for inquiry into a world "still in the process of making" (James, 1991) and potentially unmaking (Hennion & Monnin, 2020), shedding light on the identification of cosmological attachments and detachments, on "what is being forsaken" or "what must be forsaken" (Landivar & Ramilien, 2015) — a corollary of the pragmatist expression of value: what we hold dear and what holds us (Hennion, 2017). Following Latour (2012, p. 23), such a move marks a shift from narratives of "human mastery over and freedom from Nature" towards a narrative that describes "our ever-increasing degree of intimacy with the new natures we are constantly creating." In the end, the organized world and the anthropology of projects, predicated as they have been on disinhibition or the pretense of mastery, have always been endeavours doomed to fail, since they have relied on the anthropocentric fiction of a master who imposes his will while denying "dependency on the sustaining other" (Plumwood, 1993, p. 195) in what amounts to an outright acosmic misapprehension of the very conditions enabling human existence.

To conclude, the Anthropocene challenges any hegemonic attempt to conceive and manage the world as a project. We have argued that the common ground for design and management can be found in the organized world, that is, a world made up of organizations, management and design processes, whose main actors are humans. We have highlighted a paradox: that the organized world is in fact an acosmia. What is at stake is neither to eliminate humans from the picture, nor to consider human activities independently from a plural world whose very subsistence is ensured by a plethora of actors engaged in worldmaking activities. The point, rather, is to go beyond the monism of the organized world. Against the backdrop of the Anthropocene, the pluriverse that overflows the organized world should then become a focal point for design. Design cannot avoid seeking to unravel the intricate interaction according to which beings of the Earth do relate to one another as they are all making up alternatives to the human-centered world. This is not necessarily a design by non-humans but a way of re-inscribing human design into other trajectories, different from those it has favoured up until now. Learning to design beyond the (one-)world of organizations and management consists in reintegrating both situated knowledge and methods of inquiry attentive to the fragility of beings and situations. After all, the point is to better inhabit our world rather than trying to improve its habitability, an endeavor that inexorably belongs to a bygone past.

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