Beyond the duality of scientific and design objects

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Introduction

Knowledge space has been distinguished from object design at the Age of Enlightenment. However, the tendency for science to have objects beyond subjects raised with the industrialization, without recognizing Design regimes. The exponential increase of knowledge and instrumentations, combined with the urgent appeal to their orientation towards social demand, tend to put the objects at the center stage and to downgrade the subjects. The objects get multiple identities, become heterogeneous, are products of the disciplines and flood them at the same time. The scientists are worried with the drift of the conditions and the rigor of the reasoning. Instead of multiplying the examples, the general symptom being called "crisis of science representation", we propose to treat the question at the base. We discuss the pertinence of [re]thinking the status of objects within science using Design theories. This work has been undertaken according to the rigorous frame of an epistemology adapted to the contemporary or novel objects of science called generic epistemology. Generic epistemology's concern is the conditions of scientific activity.

First two fundamentals of generic epistemology: disciplines democracy and generic space

Generic epistemology calls us to revisit the features of the object in a space encompassing n disciplines none the authoritative one. But the object has been a mark of distinction of regimes: mathematics or philosophies are claimed science and discipline « without object ». Because of this abstraction, mathematics and philosophies have a preferred status and a form of authority over the other disciplines and science. But with technical or technological object don't we admit that the object may have a conceptive origin? The problem is that the object is not totally conceptual, ontology is also at its base. The philosophy of science and technique require this kind of flawed duality, but this later divide and weaken the nature of the object.

Third fundamental of generic epistemology: local devices make knowledge and concepts independents and facilitate fluxes between both

Within a discipline, the object is studied after its dimensions have been fixed to monitor rigorously the factors of variation. Because it is fixed, the object appears given and is compatible with a phenomenology. The dimensions of the objects thus remain within the discipline. Because the discipline gives to the object its unity, design disappears behind ontology. Within the technique, the object is also generally given, innovation is limited to the addition of one feature. Within technology, design, ontology, empirical and use are extended, but they are also mixed, the heterogeneity of their dimensions is not taken into account and the object may tackle more intimately the social dimension. Under such conditions, the object itself may impair invention. As a consequence, the object fixed within a discipline, one identity, one use, impair concept or ontology, when the concept of object cannot is indispensable.

We propose to think the object in another way: *the object is not given, can be visited by all disciplines, each of them gives a partial definition, part of the object's identity*.

Devices are thus needed, which build the generic space for sciences. They are composed of a management of science taking into account the working activity, areas of scientific activities promoting a collective intimacy as additional condition for scientific exchange, a matrix to decompose the dimensions in order to guarantee the relative autonomy of the disciplines and the professions and to keep the distinction between knowledge and concepts spaces while permitting the fluxes between them. Here we discern what the design theories will add for the definition and recognition of the status of the scientific objects, provided that they treat the dynamic of knowledge and concepts spaces.

4th fundamental of generic epistemology: the operators

Under such conditions, the object becomes heuristic. How can it travel from one discipline to another without any denaturation of the scope of the knowledge from which it was created? The generic epistemology proposes rigorous operators such as metaphor or fiction. How can we distinguish the conceptual and ontologic parts of the object? What are the conditions of the fluxes between the spaces of concepts and knowledge? More than conditions, it is a matter of highlighting or focusing this flux. We propose an exteriority point as "a mirror", which has to do with C/K Design theory. This point helps to distinguish science objects from technological objects. It is no more necessary to have a given object, within the device it can stay without identity, or support multiple identities, partial and non-exclusive definitions. The risks are highlighted and treated within the device, operators provide the dynamic of knowledge exchange. The object is not correlated to a theory, is not a model articulation or an ontology, is not reduced to the intention or projection of a researcher (which confers the appearance of unity), while having to do with all of this. It becomes a heuristic of the relations between intentions, concepts, timeframe, areas with a point of externality undetermined but constitutive because none of this elements can be interpreted without it.

One implication of generic epistemology: local is not opposed to universal

This heuristic object is pertinent only in intermediary spaces, which are not compatible with the classical epistemology. Neither universal, nor factual, these objects drive the change of scale and the combination or conjugation of orders of magnitude. It is then possible, locally, within rigorous devices, to propose a method to transform the objects, so that they gain a status within science, open perspectives in innovative Design, whereas the future dialogue or exchange between science and Design is treated as well as its social and societal implication.

Here are the steps of the method:

1) Go from the given object to its dimensions (within the generic space)
2) Unravel the relations between the dimensions (with generic matrix)
3) Recompose the object in intermediary spaces (build commons at n dimensions within the device)
4) Add dimensions (the object become generic)
5) Postulate the point of externality
6) Propose a heuristic

We will discuss this method by using it to visit examples taken from emerging sciences.