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FOR AN ARTIFICIALIST WAY OF THINKING ORGANIZATION

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Summary:

This work originates from the statement that the design of organizations was not considered in a systematic way by the theorist or the expert of the field. The word design is not mentioned, or if it is, it is generally assimilated to the choice of a structure in a constraint environment.

We will however show in the present contribution that organizations can really be regard as artifact and by this way that it is possible to develop a science of organization design. To this end we will first present what science of design and Artificialism are.

Then it will be possible to consider the multiples implications of the aforesaid point of view for the theory of the firm and to whom such a work can be useful.

Keywords: artefact, artificialism, empiricism, organization, science of design

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For an Artificialist way of thinking organization

Introduction

The literature devoted to the firm is particularly flourishing. Paradoxically, many authors and experts draw up a mitigated evaluation of it, considering that various theories can hardly be said to be theories of the way the firm really are. The consequences of such a situation is that, on the one hand, the building of theories of the firm looks like a “cacophony of speech” [Brechet, 1999] and, on the other hand, that the firm remain a “terra incognita” for a majority of economists [Dréan, 2002].

At the same time, and although the first research program relating to the science of the design was launched more than thirty years ago by famous theorists like H. Simon, we cannot help but notice that this science remains neglected by the theorists of the firm.

More precisely, the design of organization was not considered in a systematic way by the theorist or the expert of the field. The word design is not mentioned, and if it is, it is generally assimilated to the choice of a structure in a constraint environment. The design is then comparable with a simple choice : for this environment, choose that type of organization [Lawrence, Lorsch, 1969].

The question of the design of organizations is thus apprehended from the organizational structure point of view and not from that of process [Aoki, 1986; Sah and Stiglitz, 1986; Radner 1996], which in other words corresponds more to the design of the decision than to the design of the organization [Roux, 2003].

Is it necessary to conclude that we had better not develop researche towards a science of design ? Certainly not !

In the present contribution we wish to show how the artificialist approach to organization, which systematizes H. Simon’s point of view, opens new prospects for the theory for the firm.

But before going further in the presentation of such prospects, it is advisable to first present what the science of the design is. Then it will be possible to appreciate if firms can be considered as artifacts and by doing this to question the implications of the aforesaid sciences for the theory of the firm.

1. WHAT IS SCIENCES OF DESIGN ABOUT?

Whereas the world is filled with artificial objects, i.e. entities, tangible or not, which have been conceived intentionally in order to meet needs, one can only note that science was primarily focused, throughout the 19th century, on natural objects.

Does this fact mean that artificial objects are not worthy of interest? That they are not understandable, and finally that they could not be taught? Obviously not!

As early as 1969 with his work *The Science of the Artificial*, H. Simon showed that sciences of design – or what he called sciences of the artificial or sciences of engineering - are sciences as fundamental as usual sciences of analysis.

According to Simon, objectives and singularities of sciences of design may be expressed as follows: « *whereas the sciences of nature aim at showing that the marvellous is not incomprehensible, to show how it can be understood, the sciences of design seek to explain how the multiple artifacts which characterize the human societies are designed* » [Simon, 1991].

This reversing of perspectives brought forward by the sciences of design may seem trivial but is in fact of paramount importance. It leads to seeing the world of the

artificial as the result of the way man apprehends his external environment so as to act on its components in order to satisfy his needs [Simon, 1969].

Adopting such a point of view lead us to note that the object of knowledge of such a science is not the object as such - i.e. the artifact in its existential reality - but the process of design: « *one possible definition of design as a scientific discipline would be a study of the thought process comprising the creation of an artifact in a given (social, technical, economical, etc.) environment.* » [Kryssanov, Tamaki, Kitamura 2001].

In other words, sciences of design postulate the non-existence of a metaphysics of the artifact, that is to say a theory which would explain its *raison d'être* outside the conscience and the actions of man. As such, it allows us to consider the major difference from naturalism because sciences of design place design at the heart of man's actions. Adopting such a point of view saves theorists from making some hypothetical speculations on artifacts origin « *transformism, evolutionism, genetic, natural selection, divine creationism* » [Le Moigne, 1995: 157].

One is also led to consider that the stake of a science of design is not only operational and turned towards the instituted designers [Forest, Mehier, Micaelli, 2005]. It is also an epistemological stake.

During a long time, design was considered only in terms of a problem-solving process. However, design can no longer be reduced to this.

By making it possible to account for novelty [Kryssanov, Tamaki, Kitamura 2001; Hatchuel, 2002; Lester & Piore, 2005], the analysis of the process of design implies that creativity can no longer be considered as belonging to the field of the unexplainable [Faucheux, Forest, 2006]. It allows the questioning of possible worlds instead of real world [Roozenburg, 2002], the exceeding of the probable one [De Jong, 2002], and thus the founding of an epistemology of invention, that is, of what one conceives and what does not yet exist [Schmid, 2005].

Taking into account such a point of view leads us to consider the science of design as the science of "ingenuity", the science of creative thought and not simply expertise turned towards the application of already learned models.

By doing this, we are brought closer to the concept of ingenium theorized by J.B. Vico, which refers to a type of transversal rationality. The ingenium being this faculty to connect, to establish a correlation between phenomena distant from one another, is opposed to the academic, analytical reason which is the source of the current knowledge cartography « *because the analytical method harms ingenium (or ingeniousness) and ingenium was given to man to understand, i.e. to make* » [Vico, 1710, 1981].

More precisely, the ingenium concept, which seems to refer to the Greek *mètis* and to the thought of Ulysses, is the inventiveness thought [Faucheux, Forest, 2006], opposed to Cartesian reason which has been, according to J.B. Vico, at the origins of none of the great technical inventions of his time [Pons, 2003]. Finally, we can infer from the above presentation, that the sciences of design are about the elaboration of a science of creativeness.

The object of a science of design having been presented the question is whether it is possible to regard organizations as artifacts.

To this end we will now, and without claiming exhaustiveness, give an outline of the various meanings of the organization as artifact.

2. ORGANIZATION AS ARTIFICIAL ENTITY: AN OLD POINT OF VIEW

J.P Micaelli underlines that « *if one is to consider a technical object as an artifact – that is to say to search in its initial design the causes of its existence and in its successive redesign those of its dynamics – does not seem to pose problem, one can*

nevertheless note that to recognize organization as artifact and then to imagine a science which is dedicated to it, causes the reserve of the theorist or the expert, or at best leaves them doubtful » [Micaelli, 2006].

More precisely we will show in the present section that while regarding organizations as artificial entities is not new, H Simon introduced a major break with traditional views by claiming that organizations are artifacts.

We will then see how the change of emphasis suggested by H. Simon – from the organization as artificial entity to the organization as artifact – opens with new directions of research.

2.1 EARLY BEGINNINGS OF THE ARTIFICIAL POINT OF VIEW

As we have suggested before, while the concept of artificiality applied to organization is not recent, one should note that it was first employed in the sense of non-natural or fictitious

According to D. Gindis in “Some building blocks for a theory of a firm as a real entity” [Gindis, 2006], two representations of the firm exist at the end of the 19th century, each of them carrying direct implications for current debates on how firms should be run.

The first one considers the firm as a fiction. This view is as old as Roman law, and refers to an artificial construct under the law which is merely used for convenience. This view is far from being forgotten, since it is according to the author the basis of the modern nexus of contracts theory of the firm.

The second one, the real entity theory, goes in the opposite direction and stresses that firms are natural entities: « *a corporation is an entity – not imaginary or fictitious, but real, not artificial but natural [Machen, 1911] » [Gindis, 2006].*

The question we are interested in here is whether it is (or not) in the nature of the firm to be a natural object. The artificial qualifier is usually used in its most immediate sense: that which is artificial is not natural. From our perspective, and as we will see later on, this representation is relatively poor insofar as the question of the design of the firm is missing.

2.2. WHAT ABOUT THE AUSTRIAN PERSPECTIVE?

One finds roughly the same situation within the Austrian tradition, and in particular in Hayek’s thought due to the distinction which he introduces between order (i.e. the spontaneous result of the individual actions and not the intentional result of a plan) and organization (i.e. intentionally created construction in which each individual works towards a common end (purposeful construct)).

Indeed, Hayek, faithful to the research program relating to the spontaneous order tradition initiated in Scotland in the 18th century with authors such as A. Smith and A. Ferguson in particular, attempted to understand how institutions can be the unintentional result of human action or, to use the terms of A. Ferguson, « *the products of human action but not human design* », or those of C. Menger « *How can it be that institutions which serve the common welfare and are extremely significant for its development come into being without a common will directed toward establishing them ?* » [Menger 1883]:146 in Horwitz 2001].

By doing this, Hayek concentrated his research on market analysis neglecting in fact the organizations’ functioning. It seems that this is the reason why there is not a theory of the firm among Austrians: « *More specifically, as Loasby [1989], Langlois [1992] and Foss [1994, 1996] have noted, Austrian economists have never attempted to produce an Austrian theory of the firm* » [Ioannides 1999].

From the preceding, one will nevertheless retain that while the Austrians, and in particular Hayek, did not analyze the question of the design of organizations in return they do not refuse the idea that organizations can be designed.

2.3. J.R. COMMONS' ARTIFICIALISM

The situation is about the same among old institutionnalists. If the process of conflict resolution is, according to J.R. Commons, the instigator of institutional evolution, on the other hand his point of view is very different from which of T. Veblen because he stresses that one should take into account the short term and claims that the aforementioned process cannot only be conceived as undergone and escaping from human will and action.

By considering the role of intentions on the one hand and the negotiated character of the decisions on the other hand, J.R. Commons adopts a position contrary to that of Hayek.

As underlined by L. Bazzoli, "*social order is an order built by collective action, and not a spontaneous order such as it was defined by the Scottish philosophers*". Such a statement leads the author to conclude that "*this social system representation that one could describe as "artificialist" implies that the organized individuals, if they are determined by the institutions in which they intervene, have in return a certain amount of power over them*" [Bazzoli 1995: 38-39].

Nevertheless, while the rupture introduced by J.R. Commons is far from negligible, and led some authors to underline the artificial character of a histheoretical framework, one can only consider it regrettable that the process of design is not specified.

From our perspective, this is the reason why it is difficult to regard J.R. Commons as an artificialist author.

2.4. BUILDINGS BLOCKS FOR A THEORY OF THE FIRM AS AN ARTIFACT

A. Demailly and J.L. Moigne, in the introduction of their work *Sciences of the Intelligence, Sciences of artificial*, underline H. Simon's audacity "*claiming in 1943 at twenty seven years a thesis whose central argument was: social organizations are not given, they are designed*" [Demailly, Le Moigne, 1986].

Since this date Simon was always interested in the « artificialist » nature of organizations. He claimed in his book *Administrative Behavior* written in 1947 that the design of organization is not different from an architectural one. He therefore strongly believed in 1969 in his work *The Sciences of the Artificial* that there was no reason for limiting the word "artifact" to simple technical objects.

According to him the project of understanding the genesis and/or the evolution of an organization consists in answering the following questions: Who designs? What are the designer's goals ? What is the process followed?, How does one arrive at such a decision? These questions seek to make design the central process of the dynamics of organizations but also introduces, without any doubt, a serious amount of historical relativism.

Unfortunately, although H. Simon is recognized as a theorist of organization, it should be observed that the arguments which refer to the artificial nature of organizations are disseminated throughout his work. This is perhapsthe reason why his theory of design, which from our perspective seems an important contribution, is less well known by economists.

Systematizing this work, the artificialism approach [Micaelli, Forest, 2003] sees the organization as an object having artificial properties and identifies its designer, that is, the manager in the case of the large modern company.

3. IS IT LÉGITIMITATE TO CONSIDER ORGANIZATIONS AS ARTIFACTS?

Artificialism is a theoretical framework of the origin and dynamic of artifacts. It relies on five key propositions constituting its core:

Proposition 1 — Artifacts are « universal » (the universality is not seen here in terms of time and space but in terms of objects).

Proposition 2 — The existence and the dynamics of artifacts result from the design process.

Proposition 3 — Design is submitted to a time constraint. Design is creative (i.e. its result and its process cannot be predicted). Design is proactive (it is not possible to design without any intermediate artifacts). Design is evaluative (designing implies evaluating the performances of that which is being designed and of how it is being designed). Finally, design is complex (different views are required in the design process).

Proposition 4 — Design can be empirically and experimentally observed and therefore theorized at different and complementary levels (macro, meso, and micro).

Proposition 5 — Design being both universal and creative, the dynamics of a system of artifacts (the succession of artifacts made by man) is not gradual. There can qualitative, unforeseeable, important and fast leaps in the dynamics of artifacts [Micaelli, Forest, 2003].

As is shown in these five propositions, artificialism is partial. It does not cover the whole field of human actions. It cannot explain the reason why any given value, conflict (social or not), macroactor (professional, political, social, etc. group) appear at a given time in a given place. However artificialism can explain how the above groups design alternative artifacts (fashion, propaganda, lobbying, etc.) from the needs induced by those values.

Artificialism centers on the tactical dimension of actions, that is to say on the process responsible for the transition from the formulation of a need to the realization of a satisficing solution in a given time interval.

Following artificialism, an artifact can be regarded as such, if and only if, it has been designed by man in order to satisfy a need. Thus, applied to organizations, the first line of demonstration relates to the existence of goals, while the second to that of a design process. What does exactly?

3.1 RELEVANCE OF ARTIFICIALISM KEY PROPOSITIONS FOR ORGANIZATIONS

While for H. Simon there is no doubt that « *similar lists of desiderata that must be attended to could be drawn up for designing organizations* » [Simon 1995: 251], one can note that there seems to exist a relatively broad consensus: « *Organizations are social inventions, that is, they are created by people for specific purposes at a particular time in history (...). The structure of an organization reflects the objectives it sought to accomplish* » [Davis, 1982: 213]. Moreover, A. Martinet and A. Silem underline that dealing with firm performances without stating the goals, the objectives, and the strategies pursued does not make any sense.

Integrating goals and objectives leads us to consider organizations as artifacts in the same way as any technical object and more generally any material or immaterial objects designed by man.

This is not just an intellectual point of view. Based on a comparison of organizational models of different car manufacturers, P. Milgrom and J. Roberts, in their work *Economics, organization and management* show, right from chapter one, that success (or indeed failure) of an organizational model is linked to its relevance (or irrelevance) with regard to the goals and very objectives of the organization.

If the first proposition of artificialism were to be accepted, does this mean the same thing for the second proposition? Can we really speak of organization design?

Here again it seems that the answer is affirmative as noted by D. Muster and W. Weekes: *“Engineering and organizational design deal with different entities but the process is the same”* [Muster, Weekes, 1985: 137] ; or by L. Davis: *« design process (...) [is] the process of inventing or creating or forming an organization within which the efforts of many people are combined and coordinated to achieve the goals crucial to the organization’s survival and success »* [Davis, 1982 :211].

In addition, many works converge to present the organizations design process as a multi stages problem resolution process [Muster, Weekes, 1985; Perrin, 1994] that makes possible the emergence of a satisficing concept of solution [Simon, 1969, 1995].

, As H. Simon underlined it, citing the example of the Congress initiated post-war Marshall plan design that was operated by the Economic Cooperation Administration (ECA): *« The goal of the legislation was to provide the European nations with funds and goods that would enable them to revive their own productive capacities. But there were different ways in which an organization could have been structured to do that. The ECA could have been an organization for processing European shopping lists, validating them, and aiding procurement. That was one model. Another conceiving the ECA as an extension of the State Department, organized to engage in bilateral negotiations with individual nations to fix the terms on which aid would be offered. A third model – the one followed – conceived the organization as a nucleus around which economic cooperation among the European states could develop, so that they would be led toward a European economy very different from the fragmentation of the pre-War era. »* [Simon, 1995: 256].

Thus artificialism breaks radically away from theories that recognize any optimal organizational structure. At best, an organizational structure can be said to be satisficing. Artificialism, most probably because it cannot be and does not claim to be predictive, therefore appears more robust than previous theories. Quite obviously, the « one best way » idea, applied to organizations, does not make sense. The adopted solution is contextualised with regards to the objectives of the organization as defined at a given time with given values but also to the way production is thought out. Therefore, transposing a successful solution from a given organization to another is characteristic of a total misunderstanding of the genesis process of firms and their dynamics.

This example also shows that not only do alternatives emerge in the design process, the problem also does. By designing we learn what we want.

Building on H. Simon’s example of oil painting, J.L Lemoigne explains that the design process is the process through which an ongoing system defines new intermediate goals which in turn trigger the identification of new means («Means-Ends analysis»). These new means may then suggest new goals: *« When using oil paint, each brush stroke creates a new kind of organisation which yields a source of new ideas for the painter. Painting is a cyclical interactive process between the painter and the*

painting in which ends lead to new brush strokes while the gradually changing organization of the painting suggests new goals » [Simon in LEMOIGNE 2002: 4].

The consequence of such an assessment on the dynamics of the design process is that reducing design to a situation of choice is a misunderstanding of the reality of design. Choice is only a minor part (for which time and resources spent are a unit) of the designer's activity: « *I do not wish to dwell upon the choice aspect of design, for it is not the aspect on which designers spend most of their time and energy. Most design resources go into discovering or generating alternatives, and not into choosing among them* » [Simon 1995: 247].

In other words designing is not only a matter of choosing among pre-existing alternatives. It is from the combination of hypotheses that alternatives and therefore creation emerge. And it is impossible to consider the result *ex ante* [Simon 1995].

3.2 ARTIFICIALISM: A UNIVERSAL THEORETICAL FRAMEWORK?

The above arguments lead us to consider organizations as artifacts, like any technical objects and more generally like all the material or immaterial objects designed by man. However, is there really no difference with a simple technical object?

Some, opposing ontological arguments, related to the essence and irreducible singularities of organization, will undoubtedly claim that our conclusion is a little hasty on this point. That it is not in the nature of the organization to be an artifact [Micaelli, Forest, 2003].

Nevertheless one must note that this type of argument stresses more the singularities of the organization than an impossibility of regarding it as an artifact.

Others will stress that there are notorious differences between the design process of an organization and that of a technical object. This point of view is undeniable.

Arguably, in addition to the fact that one is dealing with designers who are unaware of themselves, in the majority of cases there is no set of conditions allowing one to test (i.e. to simulate) the alternative organizational concepts *ex ante*, unlike a mechanical system for example.

Indeed, the impossibility of simulation for the design of organizations is reinforced by that of correctly identifying the representations of its future members and anticipating the induced effects. This problem is even more complex if one considers that the system is itself a representation (a design) of those who observes it [Le Moigne, 1985; Genelot, 1992; Perrin, Forest, 2002]

Do these differences, which by no means exhaust the argument, preclude us from regarding organizations as artifacts? Undoubtedly not!

There is effectively no more difference between the design process of an organization and that of a vehicle, than between the design process of a software and that of a public space or between the design process of a landing gear of a plane and that of the brake of a child's scooter.

Moreover, it should be stressed that claiming that mechanisms can be different from one artifact to another is, here again, more a matter of stressing the singularities of the organization than to underline the impossibility of regarding it as an artifact.

In other words, it is necessary to understand that the concepts and key propositions of artificialism have not been theorized and developed to account for only simple technical objects and that the social sciences can potentially adopt them.

Artificialism, indeed, was not developed to serve a unique discipline (mechanical design, urban space design...) or group of disciplines: the engineering sciences for example. Artificialism acts as a generic (universal) theoretical framework of the emergence and dynamics of artifacts that mechanics, computer science, biology,

economics, and other disciplines can each mobilize without questioning their specificity.

In addition, it is necessary to underline that the will to restrict the space of artificialism to engineering sciences only is the result in the majority of cases of a real ignorance of the way technical objects are designed.

It is precisely the case of F. Hayek when he rejects socialist planning on the basis of the limits of human rationality on the one hand, and on that of our capacity to design top-down solutions for social problems on the other hand: « *There is nothing in the ideal of the Enlightenment that commits one to applying inappropriately the methods of science, which are so powerful and productive in their own arena, to the social world. The mindset of the scientist or the engineer is inappropriate for solving human problems* » [Horwitz, 2001].

Hayek's refusal to make use of scientific methods resulting from the engineering sciences for social problems is indeed founded on a double error of judgement. The first is to believe that all can be known. The second is that when we design a technical object we know *ex ante* what will emerge. However, whoever has been in a situation of design knows that this postulate is unfortunately false.

From what precedes one will retain that claiming that there are differences in the way the need emerges for example not only does not question the generics of the artificialism framework, but on the contrary, leads us to thorough research in order to better understand the design process of the different classes of artifact [Forest, 2005].

4. WHY TO DEVELOP ORGANIZATION RESEARCH TOWARDS A SCIENCE OF DESIGN?

To consider organizations from the point of view of the design sciences is useful to three types of actors: the manager as the designer of organizations, the teacher who trains the aforementioned managers and the researcher.

4.1 CONTRIBUTION TO MANAGERS

A priori, managers seem to be the first concerned by the development of organization research towards a science of design.

Why? Because this research should be able to help them to understand and exercise their professional activity.

Stating that organizations are designed and elaborated artifacts leads us to focus on the analysis of organization design process. Today there is a severe lack of knowledge on the choices made, on the dynamics of the process. The very few existing publications come from business literature and, if we take a closer look, do not deal with « organization » or « organizational design » as one might expect but with what may better be termed « organization re-design ». The question is: can we do without research on organization design ? This seems all the more paradoxical than for the past few years creating new businesses is at the forefront of French economic policies.

What is at stake is thus the development of knowledge on organizations design process. More precisely, the aim is to establish a scholarship backed up by history through a reflection on the ways the science of design can take into account organizational problems.

However, it is less interesting to describe the external aspects of organizations or to compare their « design ». What matters is the analysis of the design process of their structure [Perrin, 1994]. Recognizing that organizations are the result of a design process implies trying to unveil the content of design stages and more particularly their « conceptual design » and « embodiment design » stages. In fact, we believe that this is

the condition for an explanation of what really occurs and for an understanding of why protean entities can coexist.

The stake is resolutely practical here. The objective is to gain knowledge which enables managers to better understand in a reflexive way their activity and their position in the process in order to improve their location. This knowledge can take the form of concepts or models of the process. From a more operational point of view this knowledge can be valorized through the production of guides, methods and tools, dedicated to the improvement of their activity.

Indeed, we hypothesize that any improvement in our understanding of the design process should have positive effects on organizations by identifying key factors for example. We hypothesize that such work could help us appreciate the possibility of deploying methods developed to assist the design of technical objects for the organizations too.

4.2. CONTRIBUTION TO TEACHERS

To consider organizations from the point of view of the design sciences is also useful for teachers who train the aforementioned managers.

According to H. Simon, whoever imagines some provisions in order to change an existing situation into a preferred one is a designer [Simon, 1991]. He thus concludes that it is design which makes the difference between sciences and professions and that engineering, architecture, management schools as well as the faculty of medicine or the institutes which train teachers, are all concerned by the process of design.

This is not an isolated point of view.

C. Schmitt and M. Bayad, basing their research on that of A. Martinet and that of R. Teulier-Bourgine, underline that many tasks in organizations are tasks of design [Schmitt & Bayad, 2004].

One is thus led to a shift from the vision of the manager/decision maker to that of the manager/designer.

Considering managers as designers leads, however, to wondering about what their competencies really are. This is precisely the problem.

Building on the work of R. Hayes and W. Abernathy and on that of T. Peters and R. Waterman, D. Musters and W. Weekes stress the vacuity of our education system in terms of managerial training: « *Without doubt, our education system has been successful in training analysts (...). However, we appear to have virtually ignored the training of inventors, creative designers, synthesists and generalists* » [Muster & Weekes, 1985].

The work *Made in America*, published in 1990 by M. Dertouzos, R. Lester and R. Solow, as well as the National Research Council report *Improving engineering design: designing for competitive advantage*, also arrive at the same conclusions.

This is why we think that by developing the science of design we also contribute to the building of a "science of organization design" that we are persuaded is necessary for the training of managers, too strongly embedded in the traditional representation of the firm based on the emblematic figure of the super calculating and optimizing decision maker and insufficiently on that of the ingenious and creative decision maker.

Thus, the major contribution of a science of design to teachers is to give them the possibility to effectively train designers through a new representation and understanding of real managerial activity.

4.3. CONTRIBUTION TO RESEARCHERS

One must add to the practical and institutional stake of developing organization research oriented towards a science of design an epistemological one.

Why? Because developing such a point of view is, for a community of researchers, a necessary way of examining the nature of the knowledge produced but also about the methodologies used in its produce .

To dispose of a research methodology (or some methodologies) is indeed important for recognition in the scientific space of research. To this end, we believe that empiricism is an alternative research methodology, adequate for the founding of a realistic theory of the firm and of its evolution.

Following the artificialism point of view, an artifact can be defined in an empirical way. The association of an object to a designer and to a process of design or a process of redesign - synonym of rationalization - is sufficient to define it as an artifact. It is useless to have an unspecified talent or revelation in order to carry out this process. Curiosity, a sense of observation, the will to find and reconstitute the traces of its design, are sufficient [Micaelli, Forest 2003].

The situation is the same for the design process. It can also be observed empirically. It is then possible to identify its actors, its object, from that one design? How does the creativity appear? And so on.

By this way we are close to the old institutionalist tradition according to which the realism of an organization theory must be based on the realism of its assumptions: "empirical success relates first to the need for founding empirically its assumptions. For social sciences it means to elaborate theories on relevant cognitive and behavioral assumptions from the observation point of view" [Bazzoli, Kirat, 2002:23].

One is led to note that considering organizations from the science of design perspective invites us to question the epistemological bases of economic knowledge which holds, according to L. Bazzoli and T. Kirat, that the deductive method is the only scientific method that can be extended to the knowledge of institutional phenomena [Bazzoli, Kirat, 2002].

5. SOME CONCLUSIONS

The present contribution allowed us to note that while the concept of artificiality applied to organizations is not new, very few works employ it in the sense of designed artifact, neglecting the analysis of their design process.

One might believe that such a situation implies an absence of interest to develop such a science of design. We nevertheless underlined the practical, institutional and epistemological issues at stake in such a development.

Finally, from our perspective, what is at stake is the rehabilitation of the science of design which has been all too often neglected.

We believe that this science of design (science of ingenium) can offer the social sciences, and particularly economics, a better understanding of the way organizations really work on the one hand and a new theoretical framework of firm evolution on the other.

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