The Expressions of Inquiry

The truth is one and everywhere the same,

yet the expressions of it are many. — Cicero

A Structure of Design Inquiry

In a field of design that is constantly being expanded and gradually involved in all areas of human experience. A strategy of inquiry plays a role will become a critical direction for the discipline that finding the problems instead of answering. The method is varied, but the gold is the same.

The history of inquiry is the history of reformation the understanding of the term *Reality*. Trees, rivers, mountains, buildings, vehicles that all physical we can see, touch and recognize, this earth and the entire cosmos. That is the Reality of *Entitativity*, *as a pure entity*, the world we live in, construct knowledge from the elements of the knowable (McKeon 1990a, 250). All physical activity manufacturing takes place here, but not all the problems. As an Humanity, cognitive evolution determines the formula for acquiring and understanding the world. "Naturally", the process of knowing the Entity was segmentation by cognitive limitations. Understanding is the first step when confronting complex objects, and the method of inquiry becomes critical. Resolve the problems encountered in the known in theory practice, and production to reconstitute the known in a new form (McKeon 1990a, 250). That is Essentialist in the reality of thought, the world we identify, every entity has a set of attributes that are necessary to its identity and function (Richard L. Cartwright, 1968, p. 65). Epistemic, built on the limited understanding of perception and inquiry, present the known as products of the discrimination and activity of the knower(Z. McKeon, 1990, p. 250). That is *Existential* in the reality of thought. The "existence" comes from the *Latin* word *exsistere* meaning "to appear", "to arise", "to become", or "to be", the world we known. The forming process of An idea of

Existence is meriting research, not to reinforce the shape but try to expand and dilute it.

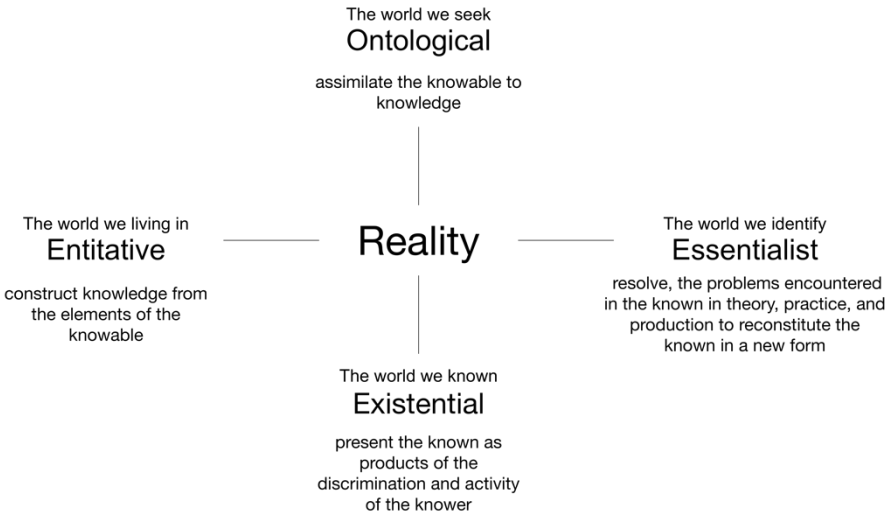

Figure 1 Zahava K. McKeon < Philosophic Semantics & Philosophic Inquiry >

The complex objects from inquiry and cognition are not only a natural reality but also cultural complexes must have a real existence. That is Ontology in the reality of thought, the world we seek, assimilate the knowable to knowledge(McKeon 1990a, 250). The word "*Ontology*" in Dictionary means a branch of metaphysics concerned with the nature and relations of being or a particular theory about the nature of being or the kinds of things that have existence[1].

In the inquiry of reality, practice and production are the main problems in the design of embryonic, and the solution led to further limited by the understanding of the elements of objects in the Entity word. The real problem has not shown yet.

> *The scope of entities designed is vast and the knowledge employed in design is very diverse, ranging through all aspects of human experience.* ***Only if*** *there is some* ***specific commonality*** *between these activities in spite of the great diversity of the objects they deal with, it is*

[1] Merriam-Webster Dictionary: https://www.merriam-webster.com/dictionary/ontology

justifiable to talk about design in general terms.(Rittel 2010, 1)

The fragility of the design ability takes place in the world of imagination, where one invents and manipulates ideas and concepts instead of the real thing(Rittel 2010, 1). In such an inquiry, the problem comes from the design itself, considering that the understanding of the entity is from the elements of the knowable, but also in the experience of the designer's research of the physical world and the communication with the user. In The Liberal Arts is *Rhetoric*, a structure of Facts, art of persuasion and communication (McKeon 1990b, 276). In the strategy of inquiry, that is Rhetorical Inquiry (Buchanan, 2007, p. 6).

We must not forget that as the depth of inquiry becomes vast and sophisticated, Rhetoric faces a problem, provided disciplines applicable to facts by isolating structures of facts; those structures do not become more complex and challenging as facts become numerous. Examines inventions in the humanities and discoveries in the sciences are needed, an new Rhetoric (McKeon 1990b, 276). In The Liberal Arts is *Grammar*, an art of interpreting language, experience, actual verbal usages. However, with problems, Use of footnotes to recover meanings familiar to the artist does not always contribute directly to uncovering of values in his art (McKeon 1990b, 277). In the strategy of inquiry is *Design Science*, seeking the basic elements combined and synthesized to yield the world of experience and the cognitive processes of designing and decision-making(Buchanan 2007, 4). Provide the discipline for interpreting the structure of statements and experiences in arts, sciences, and societies are needed, an new Grammar(McKeon 1990b, 278). In The Liberal Arts is Logic, a Structure of Methods of Inquiry and Proof the achievements of men in appreciation. However, the problems of the social sciences and the humanities may not easily become intelligible and solvable when the scientific method is applied to them(McKeon 1990b, 280). In the strategy of inquiry, that is *Productive Science*, focuses on the discipline of making, within the framework of products

and their use, or Poetics—from "*poeisis*" the ancient *Greek* word for all activities of human making, and from *Aristotle's* specific use of the term for the science of made -things or the artificial. (Buchanan 2007, 6).

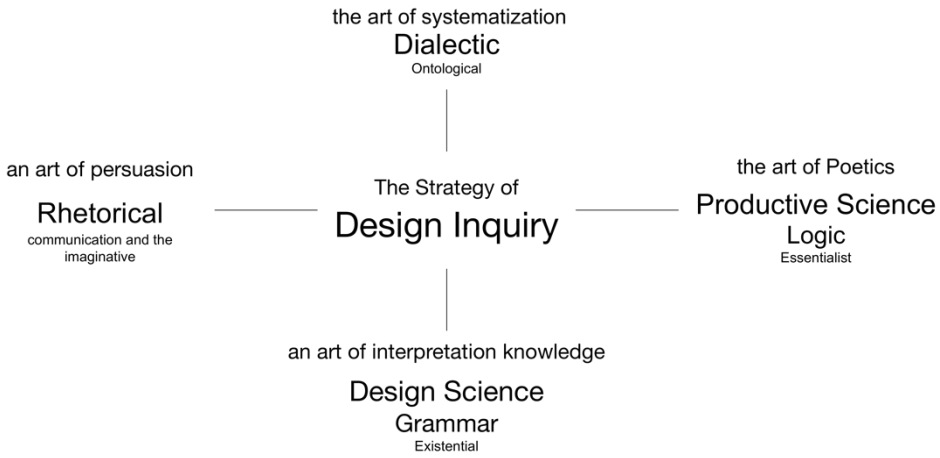

Figure 2

A new Logic is needed, provide the discipline for examining the structure of consequences in processes and discourse, a Structure of Systems of Knowledge and Action individuality. In The Liberal Arts is *Dialectic*, the art of systematization. But degraded to an ideological and schismatic, often expressed as a need for a common frame of reference for all men, all cultures, or all knowledge, no preserve the pluralism of frames that made possible the advances in knowledge, in culture, and in community which have constituted mankind a common frame of reference (McKeon 1990b, 281). In the strategy of inquiry, that is Dialectic, explain design and the products of design within a larger whole or system (Buchanan 2007, 4).

The Essentialist intuition

Moholy Nagy discusses the nature of design in the reality of *Essentialist*, to resolve the problems encountered in the known and reconstitute in a new form, define it as *Complex Objects*. In the article *Design Potentialities*, published in *Design in Motion*, the inquiry begins with *Louis Sullivan* the statement of *Form Follows Function as a Principle*. Apply one to the

phenomenon in nature, every process has its necessary form, which always results in functional forms (Nagy 1944, 82). The Nature principle when translated into human technology seem *falls very far* short of the optimum. The reason may come from the knowledge and practice, and the ability to reason and grasp (Nagy 1944, 82). However, the inquiry was not extended to the process of cognition(or reasoning) and the ability to choose, but the essence of the problem. By explore the influence of materials, tools, and techniques on the form of artifacts while also pointing to another problem that new production technologies, such as assembly lines, was not created a new age that may change the status. The pretentious goal of the novel form *Materials and Manner* rotates around the creation of the resulting alternatives, rather than finding new features, new meanings, or new possibilities.

> *Our problem now, is to use present day materials and machines as capably as our ancestors used* ***the limited means and tools*** *at their command.*(Nagy 1944, 83)

Further conclusions show that the answers are not always easily described or rationalized. The emergence of alternatives might bring difficulties to appear before the design is complete and loss of choice. When after finding the problem and attempting to decompose logically inferring, Nagy synthesizes the elements that have been analyzed and perceive the interrelationship to finding the Functional Elements. The answer comes from the *intuition* of the designer, *The Artist`s Role* (Nagy 1944, 87). The word "intuition" that Nagy used means insight, sensitivity, the guides for structure, proportion and form. However, it will take a long time for such new ideas to be accepted.

Although, discover the form, manner, material, and function of the cause, take the logic strategy to understand the phenomena to integrate and find the functional elements. That is the method of *Problematic*, the art of *Poetics*, the strategy of *Productive Science*, inquiry by

resolution and questions dependent on discoverable causes. It also has problems from the strategy which mistakenly believes that the scientific method will make the social sciences and the humanities intelligible and solvable, thus ignoring the functional elements of society and humanity, especially those that are illogic (McKeon 1990a, 245).

> *One remedy against this is the **conscientious training** of a new generation of producers, consumers and designers who have grasped the importance of the basic relationship of "form and function."(Nagy 1944, 90)*

The one that the conscientious training must have a process from the search for design activities or the search for physical objects. The reason why designers being limited by knowledge and practice, as well as the ability of reason and grasp and the social implication in the process, was not considered to be the locus of the Essence inquiry.

Existential Combination

Herbert Simon discusses the nature of design in the interpretation of *Existential*. We must be clear that the interpretations of Existential and Essentialist are *Phenomenal*. The latter resolve problems by seeking properties and cause which are natural functions or acquired conditioning, the former discriminate statements and meanings which may be used to produce knowledge or attitudes or satisfactions (McKeon 1990a, 246). We may see the different methods, *Logistic* in the strategy of Grammar and *Problematic* in the strategic of Poetics, the common require methodological procedures for different problems or subject-matters, each with Its own indemonstrable first principles and univocal definitions, this is *Particular* methods (McKeon 1990a, 245). Similar with Nagy, yet Simon recognizes products and processes as an intricate component and having the potential to be influenced by the elements that underline. In the article *Problem Forming, Problem Finding, and Problem Solving in Design*, Simon

scientifically examine underline elements that shape design and the methods in which the selected ideas, processes, and objects that can exist. He focuses on fining and forming the properties and implications that behind those issues.

At the beginning of it, Simon made a subjective review of the design by identifying Terminology. He perceives the value of analysis and synthesis in design action as Nagy, both aware of the impact of design choices on design conclusions. Although, He noticed the design action is trying to *find an acceptable solution* that *can be realized*. Also, the difficulty of design experience in choosing alternatives, one always starts with some components that *can be produced*.

> *Design, as I am using the term, means **synthesis**. It means conceiving of objects, of processes, of ideas for accomplishing goals, and showing how these objects, processes, or ideas **can be realized**. Design is the complement of **analysis** — for analysis means understanding the **properties and implications** of an object, process, or idea that has **already been conceived**.*(Simon 1992, 246)

Though Darwin's research, Simon found the underline elements in the design active: *Combinatorics* (Simon 1992, 247). However, There always are unexpected alternatives that be foreseen. The problem lies with the designer's choice in the analysis and synthesis from the process of gathering and processing information in the brain.

By combining the index of cognitive science, Simon finding others underline elements that influenced design action: *limited information, limited memory,* and *limited computing power*. Moreover, the design is the game of Combinatorics those *Primitives* (Simon, 1992, p. 247). Further analyzing the structure of these signals that have found forming a critical conclusion. While the process of giving meaning base on what could be known, then not only do

alternatives emerge in the course of the design process, but the design goals emerge also (Simon 1992, 251).

The "logic" is presented in terms of Language and Experience. Simon interpreting actual verbal explains keywords, such as synthesis, analysis, choice, alternatives, primitives, combinatorics, with strong subjective expressions. He is "talking" to the audience alternately tracing consequences in statements, thoughts, and processes like the art of Poetics/Logic in Nagy`s, the inquiry by resolution and questions dependent on discoverable causes. With the help of these signs and symbols, Simon drawing a map of the designer`s cognitive process and forming and finding the underlying elements of the problem. These constitute meaningful conclusions. That is the art of interpretation knowledge, a strategy of *Grammar*, a *Science*, use *Logistic*, proof by construction and decomposition dependent on indivisible elements. It also has problems from the strategy which mistakenly believes that using *footnotes* is the best way to recover meanings familiar, thus deviating from the values behind signs.

Synthesis symbols of limitation and causes of cognitive processes, those limited by the knowledge, practice, and the ability to reason and grasp, seem Design issue is powerless. Even so, however banal the primitives, novelty - even admirable novelty - can emerge out of this combinatorial process(Simon 1992, 247). Still, the impact of the alternatives produced and the choice active in the process of design inquiry, as well as the perceived flexibility of such seemingly inevitable crises, is determined to be the inquiry focus and does not explore the meaning of these novelties.

The Entitativity Imaginative act

Horst Rittel discusses the nature of design in the reality of *Entitativity*. In the article *the Reasoning of Designer*, he saw the widespread dissatisfaction with our ability to design *the worlds we live in*. Moreover, by interpreting the scope of the entities design, one seems to get

deeper into all the field of human experience and seems to be unmanageable. What Rittel tries to make an opinion that The future of design can only be seen in this series of actions by studying the specific commonalities that may exist.

> *The scope of **entities designed** is **vast** and the **knowledge** employed in design is very **diverse**, ranging through all aspects of human experience. **Only if** there is some **specific commonality** between these activities in spite of the great diversity of the objects they deal with, it is justifiable to talk about design in general terms.*(Rittel 2010, 1)

Those are Facts, and Rittel at the beginning of the article explains the conditions, behaviors, and problems that arise in the design and physical world. In the search for specific commonality, we can easily find the performances of designers in think before act. Those are Situations or Phenomenon. Based on them, Rittel tried to convince and pass on the understanding and perception of those facts. Design is plan making that takes place in the world of imagination, in order to create ideas and concepts for the upcoming reality and to be prepared (Rittel 2010, 1). To explore the possibility that in the case of intentional, purposive, and goal-seeking actions called *disorder*, the effective and only way that Rittel *relies on Reasoning*. Those are *Opinions*, induce by arguments that lead to agreement, but not Submission or Hypnosis.

> *Since design is; intentional, purposive, goal-seeking, it decisively **relies on reasoning**. Studying the reasoning of designers becomes a way of attempting to understand how design happens - **possibly, the only way**. We may not know much about reasoning either, but at least it is not nothing.*(Rittel 2010, 2)

Difference with Nagy and Simon, 'logic' in there is not the sense of a formal logic, but as a certain way of reasoning, a 'philosophy' guiding a mode of conduct (Rittel 2010, 2). Rittel explains the special meaning of "Reasoning" and the description of its process phenomena and thus the renewed meaning.

> *From the beginning, the designer has **an idea of the 'whole' resolution** of his problem which changes with increasing understanding of the problem, and **the image** of its resolution develops from blurry to **sharp** and back again, frequently being revised, altered, detailed and modified.*(Rittel 2010, 2)

The situation that Rittel depicts an idea of the 'whole' resolution that Designer has at the beginning of the design process is another perspective trying to portray this problem focuses on the Functional Elements that have "an idea", intuition in synthesis; Different from Simon, focusing on the "an idea" formed in the combinatorial process. Rittel was converging on "an idea" that *already have* and the one communication with the entity world which will probably re-adjust it.

Those Facts are aware of difficulties and instability in the selection process. Also show that all deliberations terminate with judgments, a "Cognitive Style". Must be clear that it is different from the Existentialistic. For the former, the entity does not change, the individual and the way of interpretation is changed; the latter, the result of the feeling is the entity that is combined after analysis, a subjective existence. Rittel tried to introduce an new arguments that the persuaded or convinced may be the key under the situation of Design action that happens in the world of imagination, a more representative example to convince understanding.

> *He will - of course - commit himself to those positions which matches his beliefs, convictions, preferences, and values, unless he is **persuaded or***

> ***convinced*** *by someone else or his own insight. Design is associated with power. Designers are actors in the application of power.*(Rittel 2010, 6)

To clarify this Opinion, he analyzed the elements of the complicated. The search has not been turned into process and structure, but a state evaluation of essential factors behind it and a speech for new possibilities. Though, unlike Simon's "talking", *an art of Persuasion* attempting to prove new arguments using arguments adapted to existing opinions. That is methods of *Operational*, a strategy of *Rhetorical Inquiry*, one focuses on communication and the imaginative power of the designer (Buchanan 2007, 6).

> *Learning what the problem is IS the problem. (Rittel 2010, 2)*

It has problems from the strategy which to isolating structures of facts to become more numerous, somehow, which avoids the multiple influence factors and ignores the more comprehensive whole and details. Rittel explored the way of reasoning through facts in the presentation clues of the impact between the entity and the design. Yet, the concerns of Nagy and Simon about the problems that arise during the reasoning process may reform the idea. A Holistic Systems view is needed.

The Ontological Dialectic

Raymond Williams discusses the nature of Design in the reality of *Ontological*. In the article *Dominant, Residual, and Emergent* included in *Marxism and Literature* in 1977, Williams is devoted to the discussion of culture and systems to points out the common problem of disconnection of reality. Culture discussion should not be reckless into Epochal analysis and Static but *Staged* in historical (Williams 1977b, chap. 8 p.121).

Social impact and Novelty also appear in the inquiries of Rittel, Simon, and Nagy, but the difference is that Rittel discusses the Culture and Novelty only in the reality of Entitativity and

Facts of Persuasive Communication. Nagy discusses the Culture and Novelty only in the reality of Essentialist and intuition in the design action.

> *Design takes place in a social context. The resulting plans are usually compromises resulting from negotiation and the application of power. (Rittel 2010, 7)*

> *Novelty for the sake of novelty tries to create the illusion of new organic demands without serving real needs.(Nagy 1944, 86)*

Slightly different with Simon discusses the Culture and Novelty in the reality of Existential and interpretation knowledge. The same as Williams' analysis of culture, Simon do seeing the design process as a temporal flow, a continuous sequence of decisions with a past, a present, and a future (Simon 1992, 255), It is not a static functional element but a historical internal connection. Moreover, in some design objects, there seem to be more possibilities for action, like buildings, cities, and institutions that have long lives. The same situation also occurs in the inquiry for novelty.

Although there is no honest discussion the Nature of Design, Williams' attempt to explore the Culture and Novelty also affect design as an essential element while reflecting the lack of design exploration in a new perspective in the context of Culture and Novelty. Williams began experimenting with culture as a larger whole or system by breaking it down into elements of alternative or oppositional relationships.

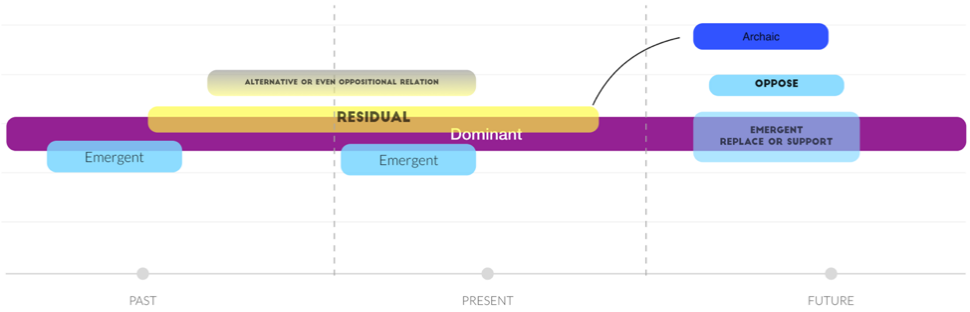

Figure 3

Culture on the path of the times must have the current *Dominant* power, effectively seized the ruling definition of the social, leading and producing certain forms, meanings, and values (Williams 1977a, 121); *Residual*, an element of the past may alternative or oppositional form Dominant, as effectively formed in the past, but it is still active in the cultural process and an active element of the present (Williams 1977a, 122). A future continues to be created: *Emergent*, new meanings and values, new practices, new relationships and kinds of relationship are continually being created, and Emergent in the strict sense, rather than merely novel (Williams 1977a, 123).

Those are the Elements or Moments, Williams seeks Holistic Systems through individual exhibitions and dialogues between them. However, the focus of inquiry is different from Simon or Nagy in the process and specific issues, but trying to see the meaning of the culture itself produced by the relationship, the Unifying Ideas. And we can see through it to the nature of Design, see an idea that was co-founded by Moholy Nagy, Herbert Simon, and Horst Rittel. This is an method of *Dialectical*, the art of *Systematization,* The system it sought was not merely an ordering of things in a universe, but an ordering of things, thoughts, and symbols in a cosmos (McKeon 1990b, 281), a strategy of *Dialectic*, one focuses to explain design and the products of design within a larger whole or system (Buchanan 2007, 4). It has problems from the strategy which has been easily *graduated*.

> *The frame of reference for mankind must preserve the pluralism of frames, in knowledge, in culture, and in community. A* ***new dialectic*** *is developing from the contacts of* ***cultures****, and* ***peoples****, and* ***disciplines*** *to provide the discipline for investigating the systems of things, of experiences, and of discourses.(McKeon 1990b, 281)*

With its help, we can now compare and analyze the reasons for the separation and the necessity of existence. More importantly, the mutual support and supplement generated by the exchange of independent contexts makes the Strategy of Design inquiry an idea of whole.

Conclusion

We are aware of the strategies of analysis and inquiry from different contexts in the discussion of the field related to the nature of Design. At least should be seen in the problems revealed, we may not merely attribute the inquiry strategy and the problems faced to a unique scientific method or principle; We should see that the knowledge of the Entitative world that design expressions should be decomposed into multiple dimensions, not merely split and remain independent, not one-sided but whole, through it, inquiry will be able to respond from biological, psychophysical and sociological requirements; We can't separate the inquiry strategy into disciplines, but try to see the mutual complementation and opposition of the standard extensions behind the differences and the continuous evolution of the goals; We must see the true meaning of form follows function.

The only way to inquire complex objects is to start from a further comprehensive imagination of the structure, to improve and change the analysis and synthesis of specific problems. Only then, in the flexible thinking of the inquiry can get the "right choice" in the seeking of complex objects in the Emergent of many alternative and new goals, not just novel.

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