

Advantages of Charles Peirce's Semiotics for Design Science

チャールス・パース記号論のデザイン科学としての評価

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1. Introduction

Modern semiotics or semiology originated with Charles Sanders Peirce (1839-1914) and Ferdinand de Saussure (1857-1913). But it is only recently that applied semiotics has spread. Design semiotics is a novel science in Japan. The first publication of my approach to semiotics was "Studies on the Model Building of Design Process" (doctor's thesis, 1971), in which semiotic procedures were applied to design methodology. I intend, at present, to develop design semiotics as a design methodology. To achieve this, I think it is important to understand from the viewpoint of designing. This paper is an examination of Peirce's semiotics from this perspective.

2. Categories

Peirce's semiotics is dominated by categories developed by him which are gradations of conception, reducing manifold sense impressions to a unity — that is, First: mere possibility of quality or feeling; Second: actual existence or relation to other and shock or experience; Third: interpretation, representation, and general law or reason. The reason why these categories should be regarded as be important for design science is that they are useful not only in usual and cognitional conception but also in creation.

When people want to produce something, they think, in advance, of possible qualities that may be desired or required — such and such a shape, color, feeling, etc.. Often, however, when the thing actually produced, the desired qualities may not be accurately embodied since other factors (e.g.

material, cost, technique, etc.) must be considered, and there must usually be a trade off between these factors. Embodiment of the desired qualities, through these factors, is experience. Cumulation of such experience will create some general law, which will act as a reason for the next experience. Such a process is elementally not different from a designer's activity. He only does it technically for people. Thus, Peirce's categories are also stages of conception in designing.

Another reason that these categories are important is that the sign definition by Peirce was deduced from the categories. This will be described in the next section.

Precedently, it should be pointed that there were several usages of Peirce's categories:

1. Stages of conception — First: reference to ground; Second: reference to relation; Third: interpretation or representation — which will elementally be referred to a design process.
2. Correlates of conception — First: one thing; Second: another; Third: the third — which will be elementally referred to aspects of a design object.
3. Relations of the three correlates — First: relation between the first and the second correlates; Second: relation between the first and the third correlates; Third: relation between the second and the third correlates — which will be elementally referred to factors of an object brief.
4. Characteristics of the correlates or the relations — Firstness: possibility, quality or feeling; Secondness: actual existence, relation or 'einlichkeit'; Thirdness: general law or reason — which will be elementally referred to elements of a design solution.

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3. Triadic Relation of a Sign

Peirce defined a Sign with his categories, at the same time he explicitly explained his categories of conception by the concept of a Sign. That is, the First Correlate is a Sign, the Second Correlate is its Object, and the Third Correlate is its Interpretant. A Sign is something which stands for something (Object) to somebody in some respect or capacity, and creates in the mind of that person an equivalent sign, or perhaps a more developed sign (Interpretant). Thus, a Sign mediates between its Object and its Interpretant, that is, a Sign has a relation on the one hand to its Object and the other to its Interpretant. This is called the 'Triadic Relation of a Sign' (fig. 1).

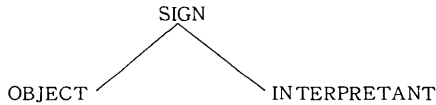


Fig. 1

It should be noted that, in Peirce's sign definition, a Sign is defined by its function and its performance. The function of a Sign is to relate its Object and its Interpretant, and the performance of a Sign is the Interpretant of the Sign. Therefore, everything which has such a function or performs as such is able to act as a Sign, for the interpreter.

According to the definition of a Sign, performance of a Sign, in other words the Interpretant, is also a Sign because of its ability to create another Interpretant. Therefore, a Triadic Relation of a Sign shows a universal mode in development of thought which forms activity or experience, and also shows a united signification and communication process (fig. 2).

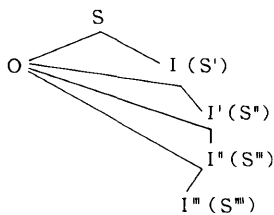


Fig. 2

A sign is usually only something like a mark or something which designates a particular thought. But a Sign defined by Peirce must be understood in very wide sense.

In designing, we use many kinds of things which correspond to Peirce's definition of a Sign. Also, we create such things in designing. Designing is an inherently technical activity which is separated to some degree from manufacturing and consumption, and which mediates between the activity of people and the object. Therefore the Triadic Relation of a Sign is a useful tool, just like a module of a science of design, to examine various conceptions and activity in designing.

4. Elaboration of the Triadic Relation of a Sign

Peirce elaborated the Triadic Relation of a Sign with his categories, then, he distinguished the Immediate Object, the Object as the Sign represented it, from the Dynamical Object, the really efficient but not immediately presented Object; the Immediate Interpretant, the Interpretant represented or signified in the Sign, from the Dynamical Interpretant, the effect actually produced on the mind by the Sign, and both of these from the Final, or Normal Interpretant, the effect that would be produced on the mind by the Sign after sufficient development of thought. These three Interpretants may be regarded as degenerated (see section 5) categories in the sequence of the Interpretant Signs (fig. 2).

Ogden and Richard's 'reference' may be compared with Peirce's 'Immediate Object', and Ferdinand de Saussure's 'signifié' and 'signifiant' may be compared with Peirce's 'Immediate Object' and 'Immediate Interpretant'. These comparisons may evidence the universality of Peirce's semiotics, though the former comparison in particular, might not be general. For, 'reference' may also be compared with 'Interpretant'. However, Ogden and Richard defined a 'true symbol' as a symbol which correctly records an adequate reference. Therefore it is very difficult to identify 'reference', recorded on a symbol, with 'Interpretant', created on the mind of an interpreter. In addition, Peirce says that a Sign mediates between the Interpretant and

its Object. If the 'reference' is equal to the 'Interpretant', a Sign cannot mediate.

But a total correspondence may be difficult to draw because of the difference within approaches. We may roughly equate Ogden-and-Richard's 'reference' and Peirce's 'Interpretant', since the difference between the two Triadic Relations comes from the difference between Peirce's logical interest in a Sign's function and performance, and Ogden-and-Richard's psychological interest in the interpretation of a Sign's context. Another reason for the difference may be that Ogden-and-Richard's Triadic Relation is extracted from another sign sequence (fig. 2), O-I-S".

This elaborated Triadic Relation of a Sign suggests ten aspects of sign classification:

1. the mode of apprehension of the Sign itself,
2. the mode of presentation of the Immediate Object,
3. the mode of being of the Dynamical Object,
4. the relation of the Sign to its Dynamical Object,
5. the mode of presentation of the Immediate Interpretant,
6. the mode of being of the Dynamical Interpretant,
7. the relation of the Sign to the Dynamical Interpretant,
8. the nature of the Normal Interpretant,
9. the relation of the Sign to the Normal Interpretant,
10. the Triadic Relation of the Sign to its Dynamical Object and to its Normal Interpretant.

These ten aspects are the foundation for the 66 Sign Classes. Aspects 1, 4, and 9 are the basis of the Ten Classes.

Designers must proceed (Peirce's terminology) various aspects from a design object, and embody them in Signs. This is a problem of aspect 2. Designers not only act through Signs (Dynamical Interpretant), but also create a new Sign as a module (Normal Interpretant). This is a problem related to aspect 8. Thus, the elements and the aspects of the developed Triadic Relation are significant factors in designing.

5. Generation and Degeneration of a Sign

In the sign classes, Peirce distinguished a Sign of ordinal kind, called a genuine Sign, from a Sign of peculiar kind, which is a Replica of, or contained in, a Sign of higher category, and called a degenerated Sign. This comes from the inclusive characteristics of Peirce's categories. Thirdness has two degenerated forms: Secondness and Firstness; Secondness has one: Firstness.

Usually, it may be thought that designing is an activity which generates new Signs. Although this is not wrong, it is insufficient. For designers must always degenerate a Sign. When a designer deciding the color of the interior of a house, refers to the utilization of space, it is a degeneration from a Sinsign to a Qualisign.

Simulation also is a common procedure in designing. A draught on the way of designing may be regarded as a model for simulation. This procedure will produce new Signs called data, though a simulation model is built in accordance with degeneration.

Such degeneration reveals the inclusive characteristics of Peirce's categories. This may be a characteristic which distinguishes Peirce's category from others, and which makes for more than a mere trichotomy. By the word category people may think of classes though it is very rare to take notice of classification. For instance, in designing, checklists mean only tables which consist of collected items. They usually do not contain the idea of process. Peirce's categories, on the contrary, constitute a table of a creative thinking process consisting of generation and degeneration.

6. Semiotics as Logic

For Peirce logic was another name for semiotics. This is very significant for designers who have relegated the logic of design behind political, commercial or capital logic. It is useful just to know the concept of Triadic Relation (i.e. to distinguish between a Sign, its Object, and its Interpretant) within the correlates of conception. How, for instance, can we recognize design methods? One

(continued on p. 23)

concept of function calls for a new concept of 'performance'. Performance is a concept concerned with whether a design actually performs as it is or not. This concept has been useful as the industrialization of housing and architecture develops. This concept is, in itself, relative. For we cannot unconditionally determine performance. It is determined on particular conditions in practice. On the contrary, function can be unconditionally determined as possibility. Therefore, I suppose that function is a Firstness and performance is a Secondness.

In spite of the new concept, the engineering of architectural design has not been very fruitful with respect to the realization of (high) quality housing. It may take considerable time to clarify this

problem. Perhaps one key to resolve this problem is Thirdness. With design semiotics we have just such a Thirdness (i.e. representation).

The categories—function as Firstness, performance as Secondness, and representation as Thirdness—are, as matters now stand, mere supposition. However, I believe, it will be worth researching.

(Manuscript received, September 27, 1976)

Reference

Peirce, Ch. S., *Collected Papers of Charles Sanders Peirce*, (Hartshorne, Ch., Weiss, P., and Burks, A. W., ed.) Harvard University Press, 1965-1966, Cambridge.

[This paper is based on research on which I collaborated with Mr. Teruyuki Monnai, a doctoral student, at Ikebe Research Laboratory.]

(continued from p. 19)

way to avoid apologies for our activities is to find a Sign, Object, and Interpretant in the activity. If, however, a reason is given as an apology, it can be treated as a problem of method by regarding the reason as a Sign whose Object is the aim of the activity which is an Interpretant of the Sign in its situation.

Peirce's thought concerning characteristics of his semiotics as logic appears, for instance, in the sign classes: according to the third trichotomy, a Sign may be termed a Rheme, a Dicisign or Dicotendence (that is, a proposition or quasi-proposition), or an Argument. It may be doubtful whether these traditional classes are also useful to design science, though it should be significant that he included deduction, induction, and abduction in the Argument.

Abduction is a point where Japanese Marxist scientists blame Peirce for his unscientific approach. But certainly design thinking can not be adequately explained simply in terms of deduction and induction. (Manuscript received, September 27, 1976)

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- (1) Peirce, Ch. S., *Collected Papers of Charles Sanders Peirce*, (Hartshorne, Ch., Weiss, P., & Burks, A. W., ed.) Harvard University Press, 1965-1966, Cambridge
- (2) Ogden, C. K. & Richards, I. A. (1923) *The Meaning of Meaning*, 10th edn., Routledge & Kegan Paul Ltd., London

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