

# A SYSTEMIC APPROACH TO THE CONCEPT OF VALUE AND ITS EFFECTS ON LEAN CONSTRUCTION

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## ABSTRACT

The concept of value, besides holding a relevant position in several areas of knowledge, has occupied, through Lean and TFV theory, an equally important role on construction. However, there can be observed a lack of systematic and sufficiently comprehensive studies regarding the value in academic production on Lean Construction. This study aims at developing a solid and coherent theoretical background for the concept through a wide literature review, not only in the field of Lean Construction, but from a systemic approach in several areas of knowledge. The results achieved point to new guidelines that can help to overcome discussions about the term. This paper also outlines the possible consequences of the current way of thinking about value in the field of sustainability and ethical responsibility.

## KEY WORDS

Value, Lean Thinking.

## INTRODUCTION

Recognizing people's values is a relevant goal observed in several areas of knowledge, from economics to experimental psychology (Fischhoof 1991), universally reflecting one of the most prominent concerns of the twentieth century: the individual.

In Construction, the concern about value first appears with its accession to the concepts of Lean Thinking (LT). For LT, client's value identification is a key stage of its philosophy. Without it there wouldn't be possible to discriminate waste or, ultimately, to enable evolution in production processes.

However, many divergences about the concept of value or its implications have been pointed out in marketing and economics (e.g., Woodruff 1997), as well as in Lean Construction (e.g., Erikshammar et al. 2010). Most of these apparent conflicts can be justified by the fact that the concept of value has attained several theories, propositions and artificial classifications over time. Aristotle, for instance, had already proposed the subdivision of value into economic, political, moral, aesthetic, social, legal and religious values. In Lean Construction, Thyssen et al. (2010, apud Rooke et

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al. 2010) suggest a differentiation between the notions of value and values, while Rooke et al. (2010) propose a clearer distinction between sociological values and economic values.

On the other hand, after a wide literature review in several areas of knowledge, we are led to assume that the concept of value has reached, up to our days, a well-established internal consistency that must be evidenced as a whole, instead of retrieving unjustified fragmentations, once a systemic approach presupposes the dissolution of unnecessary segmentation and the identification of several relations developed between parties.

Rooke et al. (2010) admit that economic value is one kind of sociological value. Menger<sup>4</sup> (2007) has already refused the main distinction between use value and exchange value, assuming that these concepts are subordinated to the concept of value itself. The division between values and value also shows no practical utility for our purposes, especially when it comes to electing objective, predictable and measurable aspects of value. Notice that what might be called “values” or “moral values” or “social values” are the main regulators of habits and, therefore, of human activities in general, which the built environment must necessarily respond to. It is observed that the formulation of moral judgments fulfills important regulatory functions of the individual own behavior and of the behavior of others through social interaction. Hence it cannot be admitted a hierarchical scheme that selects certain artificial categories of value, such as those of economic reference, over others of non-measurable pretensions only for mere occasion of convenience.

The current Economic Theory considers that prices are derived from the so-called “fundamental values”, although these can’t usually be measured by direct means (Ariely et al. 2003). Economy also considers the existence of tradeoffs. According to Mankiw (2001), to obtain a thing that we want means giving up another one (opportunity cost), based on the balance between cost and benefit. This relation is not dichotomous, but can be taken to the extreme of the complexity of human existence, once valuation is present in all fields of human activity, in an interactive and interdependent fashion. The quantification and qualification of relations between individuals and architectural objects involve all relevant values to these individuals (without knowing epistemological segmentation) and it is not limited to purely economic context, even when considered a product development for market offer.

After the presentation of this critical review, which aims to contribute to the development of a more solid background for value concept in LT, this paper discusses the practical applications of value elicitation in Construction, based on the features of value exposed throughout the text. It is argued that preferences, choices and client’s satisfaction – tangible faculties of value – do not always compete for collective or individual welfare, which also raises questions of ethical responsibility and sustainability.

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<sup>4</sup> Menger was an Austrian economist, who focused on the essences of concepts such as value, precluding the application of mathematical methods. Regarding the economy, it is observed that the literature on value management generally refers to the discussions held by the Classical school, especially by Adam Smith, although still in the nineteenth century Classical School has suffered severe critics and its theories of value have been taken as inadequate.

## A CRITICAL REVIEW OF THE CONCEPT OF VALUE

### THE NATURE OF VALUE

According to Garcia (2003, p.105), "value is a relation established between subject and object". This statement raises already important points about the nature of this concept, which will be discussed below.

Value is a relation. According to Wolfgang Kohler (1938), value must not be equivalent to useful or convenient, as nothing is useful or convenient for its own, but points out to something beyond, something primarily required. Value, on the other hand, might be precisely this relation. Menger<sup>5</sup> (2007) also argues that value is not inherent in goods, but that it's, in fact, the importance that certain goods acquired for us when we are aware that only owning these goods we can meet our needs. Thus, value is "*the importance that we first attribute to the satisfaction of our needs and that we transfer to economic goods*" (Feijó 2001, p.389).

Yet, according to Perry (1926, p. 115), "*an object is valuable when qualified by an act of interest*". Therefore, there is a strong relation between value and the subject's judgments, needs and wishes, which are very recurrent in literature. Koskela (2000), for instance, states that value refers to the fulfillment of customer requirements. Wolfgang Kohler (1938) has also attempted a review of the concept of value by associating it with the concept of "requiredness".

From this, Kohler (1938) develops a series of phenomenological considerations which may help to elucidate the functioning of evaluative processes. According to him, interest – so as value – has a vectorial nature. The interest vector is experienced as issuing from a definite part of the field, the subject, and directing towards the referenced object, so through such vectors the subject accepts or rejects those objects.

Garcia (2003, p.97) emphasizes the importance of adopting the concept of field. In this context, value is no longer presented as something punctual, as a result of a polarized relationship between subject and object, but as something inserted in a sensitive field of action. This means that an object's valuation is also relative to the relation the subject establishes with other objects, with other subjects (intersubjectivity), with the society (social macro-subject), with framing matters and with external conditions. Thus, all these elements compose a system.

From this point of view, other elements within the system – or the context – also determinedly influence the subject-object relation. Slight changes in this context - and that are constantly happening – make the evaluative activity dynamic or even unstable. The subject isn't a constant entity either, transforming subtly and continuously from experience.

### CONTEXT AND FRAMING

Kohler (1938) dedicates special attention to the importance of context in the vector settings of value and "requiredness", once, phenomenologically, the properties of a unit can be identified from the position of the object in the system.

Likewise, we cannot assume that products have measurable value, unless in the relation they have with other valuables objects. Even the economic values are only

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<sup>5</sup> Menger also considers that human desires don't need to be rational and, indeed, with the progress of civilization, the irrational desires have even become gradually more important.

evaluable due to a system that embraces them. We admit the hypothesis that in a personal context (system), values are therefore comparable and orderable, even beyond the economic context, as are interchangeable the objects embedded to them. Such comparisons are established all the time and are expressed in our everyday choices, conscious or not.

In architecture, under strong influence of modern historiography, Alois Riegl was the first to address evaluative issues into buildings, in 1903. The Viennese, particularly interested in historic buildings, engages in the definition of the "historical monument" expression. These buildings, constructed with ordinary readings or purposes, acquire monument status when respond to new specific values (Riegl 1903). And, as Françoise Choay (1992) ensures, these values are pertinent to our recent times, not being observed in other historical periods.

### **THE SUBJECTIVITY MATTER**

Along the history of philosophy, there has been a remarkable confrontation between the objective and subjective perspectives of value.

In the modern world, the subjective notion of goods is retrieved by Hobbes, who says that value depends on the judgment of others. He explains: "the value of a skilled military commander is high in time of war, present or imminent, but not at peacetime" (Hobbes apud Abbagnano 1961, p 989). It is, however, since Nietzsche that value gains a fundamental emphasis in philosophy, when there is no value that is not a possibility or a way of being of man: the thesis on the interpretation of value we call empirical or subjectivist. Under this conception, with the raise of historicism, relativism of values is born, according to which history sets values, ideas and meanings, without ever being an objective entity, but in the subject-object relation. In this sense, "there are no absolute values, and the values are just those which, under certain conditions, men recognize as such" (Abbagnano 1961, p 992).

However, there is still great confusion between the terms objectivity and subjectivity, and whose elucidation is not an objective of this work. However it is needed to be clear on the terms in which we defend the valuation from the subject.

Obviously objects experience an extraneous existence to the subject and have properties of their own - the attributes - such as the quality of "red". These attributes can be immutable, an invariable stimuli before the evaluation of individuals. Yet the subject has no direct experience with these objective properties, but with phenomena corresponding to them, conformed in the subject itself through complex mental processes related to perception and cognition. Therefore, what are accepted by objective experience are nearly homogeneous responses to the same stimulus.

Interpretation, meaning attribution, semantic associations and compositions, however, do not respond to the same level of subjectivity. These activities are much more loosely linked to object properties and happen in each individual depending on personal experiences and idiosyncrasies.

We therefore believe that an object, whose existence independent of the presence of the subject, only becomes an object of value when in relation with the subject: **it becomes in the interpretation and the judgments we make of it.**

Menger, Jevons and Marshall agreed that individuals have personal desire scales of ordinal nature and that it reflects in prices and choices. They also understood that these units cannot be compared in different people or at different times. Accordingly,

we stress the importance of a very clear distinction between values for each of the actors of an exchange relation. An interesting research shows that “architects as a group cannot predict the public's aesthetic evaluations of architecture” (BROWN; GIFFORD, 2001, p.93), for example.

It must also be pointed out that subjectivity defenders have often turned it into solipsism, ignoring, therefore, the determining influence of context and society (VASCONCELLOS, 2002). Because of the fragility of those concepts, some authors have even been increasingly refusing the conventional notions of objectivity and subjectivity, such as Rooke et al. (2010). Accordingly, to support this dichotomy is not our purpose, as said above, but to present its historical relevance and to highlight value as a relation established from the subject.

### **THE SOCIAL CONSTRUCTION**

Hubbard (1996) criticizes the remarkable trajectory of environmental psychology towards understanding the mechanisms of individual space. He also exposes the existence of a dichotomy between individualistic and social interpretations of environmental preferences. The author, however, defends the relevance of both factors in understanding the relation between subject and space. We cannot actually defend a value that is generated solely on the individual and separated from the external context, especially from social relations.

Our perception, subordinated to meaning and value issues, also depends on conventions, on a learning to be that we call culture. Rooke et al. (2010) propose the notion of intersubjectivity instead of subjectivity, which is very consistent with the properties of the value evoked throughout this paper.

One can yet assume that the requirements within social groups are more stable - although certainly vary over time - due to a constant process of feedback and mutual anchoring. Ariely et al. (2006) assume that anchoring is also responsible for prices and demands stability observed in spite of the lack of stable personal values for ordinary products:

*In the domain of economic decision-making, the most salient and potentially powerful anchors may well be the public parameters of the economy itself—the relative prices and scarcities of different commodities. [...] a certain price level may prevail because of collective anchoring, triggered by historical accidents or manipulations. (Ariely et al. 2006, p. 13)*

This way, we can suggest that the social character of value is what makes possible a theory that considers it as a variable minimally coherent or predictable, and, as consequence, viable as information input. It's the social and common defining factor of value that reflects on "group-decision-making processes" (HUBBARD, 1996).

### **THE INSTABILITY**

It is necessary to observe the volatile nature of value. So it's required the correct identification of the system, of the temporal and spatially located environment, as an important component not only for identifying value in an architectural object, but also for the conceptualization of value itself. It is necessary that the concept of value

comprehends its inherent dynamic characteristic, rather than deny it or present it as an impediment to the proper definition of the term.

Horst Rittel (1966, p.29), about the consequences of "decision theory", argues: *"the systems of values can no longer be regarded as established for long periods of time. What's wishful depends on what may become possible, and what should become possible depends on what is wished"*. Thus, to be successful, long-term strategies shouldn't be provided by hard decision models.

When value is considered as a vector in a field of action whose entities are always changing, it is assumed that: even if it were possible to accurately quantify and qualify value that an individual assigns to an particular object at a given moment, it could not be ensured that such properties would remain identical for any other moment later or earlier. Thus, in the case of a building attribute, or of the building as a whole, one can say that the value a particular user assigns to it is in constant change: from the moment a client analyses an product on offer, to the moment he/she makes the purchase, going on to the first use experience, then the second, the third, the development of ties of affection and ownership, the immediate needs, the twentieth use experience. Each new context implies a new valence of value.

The value instability issue, which Salvatierra-Garrido et al. (2010) named Dynamism, evokes a design solution deeply related to Lean Thinking: the flexibility of spaces. It makes an undetermined life-period product (such as buildings) evolution possible, by which changes can be done to adjust the right attributes for a better solution in different situations.

## **CHOICES AND DECLARED PREFERENCES**

In philosophy, Abbagnano (1961) concludes that value defines the preferable (choice possibility), being the object of a normative expectation. Value is the judgment criteria of choices and, although it might not always be a followed standard, it also cannot be set aside by preferences.

For further discussion, it's presented here a situation of an individual interested in buying a residential apartment. The value of this apartment, with its attributes, is not solely equated with the "perceived value" of other apartments in that region but also with the value of other products, such as a new car, food and clothing. Besides products, the value of the apartment is comparable - albeit less efficiently - with hours of work and effort, and the value of leisure time, as well as moral and affective issues, status, welfare, and any others objects of value. All dimensions of our life, with its valuable components, compete when we make the smallest of choices.

John Dewey, by recognizing the multiplicity of values, also recognizes the importance of choices this multiplicity is always demanding from mankind (Abbagnano 1961). But what has been actually observed, with the study of decision making mechanisms, is that individuals are not as skilled at these processes as it could be imagined. In fact, researchers like Sheena Iyengar and Mark R. Lepper (1999) have demonstrated that our brains cannot deal very well with choices.

Haase & Rothe-Neves (2007, p.121) also warn that usually individuals under various circumstances don't make rational decisions. They claim that the judgment and decision making processes are strongly determined by the architecture of the cognitive system: *"in general, it is more adaptive to make decisions based on*

*heuristics than from a deliberate effort of rational judgment"*, understanding by heuristic intuitive, rapid, evolutionarily shaped solutions.

Haase & Rothe-Neves (2007) also described several heuristics with potential to skew decision-making processes. The main ones are availability, representativeness, anchoring and emotional projection. The availability heuristic points to the fact that people make decisions based on the most salient information, without systematically considering other alternatives. The representativeness heuristic is about disregarding the prevalence of certain conditions of the population in the judgments of their probability a posteriori. The anchoring heuristic happens when the choice of a first reference point (to facilitate judgments under uncertainty) doesn't undergo the necessary adjustments, so the anchor affects the individual judgment. Finally, the heuristic of emotional projection is reflected in the strategy of projecting one own present emotional state for someone else or for a future state.

Lean Construction understands that client's values is precisely the variable that defines the visibility and quality of certain product attributes. In fact, the value assigned to such attributes is the judgment conducted by the client that will determine the purchase. What is verified, however, is that the assignment of value is not a direct activity and it is subject to various determining factors regarding perception matters, which have led to the creation of the term "perceived value". Examples of these factors are: the speed with which an economic variable changes (whether it "startles" the reasoning powers), how the information is presented, and the possibilities for comparison with other options (Ariely et al. 2003).

Ariely et al. (2003, p. 8) argue that there is greater behavioral impact when people are aware of differences or changes than when they are only aware of the prevailing levels at a particular point in time. He states that, "*it is more difficult to evaluate attributes separately than jointly, and that the difficulty with absolute evaluations is larger for attributes that do not have well-established standards*".

Those authors also present studies that show that even if one choice does not represent a preference (as when the individual does not have a preference), this choice tends to repeat itself. These studies indicate that choices do not necessarily reveal real preferences; that action taken upon revealed preferences may not be the most appropriate; and that "*market institutions that maximize consumer sovereignty need to not maximize consumer welfare*". Ariely et al. (2003, p 45) suggest that, however, ordinal utility may be a valid representation of choices under specific circumstances: people respond coherently when the differences are evident. The author concludes that "*although the distinction between 'revealed' and true preferences goes against the grain of modern economic theory, it is forced on us here by experimental evidence*" (p. 12).

However, it cannot be sustained that the same inferential process can be applied to value. The distinction between "perceived value" and "real value" makes no sense, unless value is confused with "benefit" or "preference". Value is always perceived value, although it does not always compete for consumer welfare either.

## **ETHICAL RESPONSIBILITY AND SUSTAINABILITY**

In academic research on lean construction, the concept of value does not appear devoid of complement to be qualified: it was adopted, with all its implications, the term used by marketing - value to the client.

This view of consumption is linked to several problems faced in our times, as the existence of a patent necessity in today's society: the necessity for consumption, established through several instruments such as "planned obsolescence".

Co-responsible for the environmental crisis on the planet, the need for consumption is just one macro example of how value and necessity issues manipulation may have bad results. Buildings, however, do not have the same character as other consumption goods. They not only include the majority of human activities, but are also responsible for entire cities conformation.

Contemporary values haven't dispensed almost any of the emotional and symbolic roles of housing as stated by Ruskin in 1849, who set a man's house as an untouchable temple. Le Corbusier tried to suggest the contrary: he idealized apartments as any other product - the living machines - replaceable when necessary. The harsh criticism and postmodern reaction to this proposal is proof that the value our society attaches to buildings is preserved distinct from other kinds of products. The special value that built environment acquires in our lives, and the extent of its interference in both individual and collective scales of society, leads us to consider issues of responsibility when dealing with value and satisfaction in construction.

For this, it's considered the result of an unlikely perfect evaluation, where the subject considers, in detail and free of heuristics, all relevant aspects regarding the object of analysis. The value that would be established from this relation should be the one pursued by the designers, however it is not. It is observed in both manufacturing and construction industries the proposition of attributes whose goal is to "deceive" the client's perception and, consequently, his evaluation. These attributes are often found among the so-called "selling arguments". They could still be considered waste, even as objects of declared preference, if it brings harm to the client, as an individual or as society.

Menger warns that "the belief that something has the power of wish-fulfillment may even be wrong and it still is, in fact, economic good" (Feijó 2010, p.387). In medicine, where the consequences of personal choices can be serious, it has developed a wide range of bioethical debate about the so-called "principle of decision-making autonomy" and "informed consent". The purpose of informed consent is to provide all necessary information for the patients, to allow them to decide according to their values (Haase & Rothe-Neves 2007). Meanwhile, there has been questioning on the fragility of the principle of autonomy. Understanding the built environment importance on human life, it raises the question of how the discussion of value in Lean Construction can prescind an ethical discussion.

Just as preference matters don't necessarily reflect a real preference, value - despite being a key part of client's satisfaction - is not an absolute and unquestionable requirement generating unit. On issues of environmental and historical heritage, for instance, real requirement and demand must be constantly frustrated.

The valuation of personal interests over common interests represents an explicit issue in world conferences on sustainability, for example, which leads us to the question: how can we work with sustainable design attributes, if the clients' demand is not always committed with sustainability? As focused by Abdin and Pasquire (2005, p.176), "clients may not have the adequate knowledge to drive them into demanding sustainability".



The answer to this matter may lie in the ability to instigate new needs in the final clients as individuals and, therefore, to provide value. Sustainability knowledge would help people in understanding the importance of achieving sustainability in the projects and to include issues related to environment and social demands. Abidin and Pasquire (2005) also recommend promoting clients' interest on sustainability.

Note that the prospect of global repercussions from environmental irresponsibility, as well as its massive presence in the media, already has set sustainability as a field of potential value creation that has been exploited by industry. But yet this clearly isn't enough.

## CONCLUSION

According to what has been discussed so far over value, it is possible to summarize that value is a relation established between subject and object. As a vector, it is inserted in a field with several objects and vectors that interfere with each other. Therefore, value is in constant changing process.

It is not possible for a group or an individual to accurately predict the evaluation of another, and value assigned to a given object can only be measured in a single person at a given time, and only in terms of ordinal ranking.

Also there are no arguments yet to justify the pursuit of value segmentation into categories for Lean Construction.

Value is yet the object of a normative expectation to choices' possibilities. But despite choices and preferences are means by which it's possible to identify scales of value, they do not necessarily represent value, once they might be distorted by many other factors discussed in this paper. This assertion also reinforces the idea that despite their close relation, lean construction alone is not sufficient to promote social and individual welfare or a planet's responsible and sustainable development.

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