



Explanation of Mapping Techniques in Conversion Design Process: A Phenomenological Approach to the Sensory Perceptions*

Najmeh Zebardastan¹, Khosrow Movahed^{2**} and Hadi Keshmiri³

¹ Ph.D. Student of Architecture, Faculty of Arts and Architecture, Shiraz Branch, Islamic Azad University, Shiraz, Iran.

² Associate Professor of Architecture, Faculty of Arts and Architecture, Shiraz Branch, Islamic Azad University, Shiraz, Iran.

³ Assistant Professor of Architecture, Faculty of Arts and Architecture, Shiraz Branch, Islamic Azad University, Shiraz, Iran.

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ABSTRACT: Selection of appropriate method and developing models and writing new rules for data analysis in an architectural project in order to achieve the design idea are some of the factors that influence the course of the design process. If the design is based on philosophical theories and phenomenological approach, perceptions and senses and at the same time, deals with the issue of conversion of phenomenon to matter, there will be a need for a process that is designed, new and responsive to the issues of the design. In this regard, the cognition and selection of method and selected techniques is done according to the new models, but on the basis of the documentation and basic information related to the principal theories. The design process will be based on several main parts and specific subgroups. The purpose of this study is to evaluate two main parts of the process and design approach. These two parts and the role of each in the design process with a phenomenology approach has been analyzed and reviewed. And finally, the operation of one of the strategic techniques in the design process with a phenomenology view called “mapping technique” is considered. As a result of this study, a model for the design process with phenomenology approach has been presented, the main basis of which is dealing directly with phenomena.

Keywords: Design Process, Phenomenology, Phenomenon, Sensory Perception, Mapping Technique.

INTRODUCTION

Environment design process can be established in several ways and with different generalization capabilities. Rational activities of the design process include analysis, composition, prediction, assessment and decision making. (Lang, 2002). Designers and architects like Juhani Pallasmaa have tried to analyze this process. His critique of all aspects of “education”, design and “building” originates from the domination of imagism, vision-orientation, extreme standard-orientation and virtuality- orientation while in his vision, the solution starts with the emphasis on “multi-sensory and physical perception”, “the importance of lived experience” and “the role of memory and imagination” (Pallasmaa, 2013).

Regarding to the previous studies, action in devising the model and writing a new rule for studies with phenomenological approach to the issue of sensory perceptions is important. In a successful design, the solution to achieve study objectives in the design process falls in two processes of design cognition and methodology. In each of these two paths, fundamental approaches of design and factors aiding the design, guide the designs direction towards the ultimate goal of ideation and also presenting the design. In this regard, the main question is that in which areas, the design process with phenomenology approach is critically different from other processes and how each of these parts take a

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** Corresponding Author Email: khmovahed1@yahoo.com



different path for a designer to convert the phenomenon to matter.

With regard to this question, the objective of this research is to explain the main and secondary parts of designing with a phenomenology view in the two main branches of cognition part and design method part, individually. In the meantime, the practice of effective branches such as mapping a technique will be discussed separately. It should be noted that this article discusses the design process in different parts and also in the forms of small models. The final model is accurate and no transposition is placed on different parts and in fact, this is the designer who defines the direction and priorities based on his objective and subjective ideas.

RESEARCH METHODOLOGY

The reasoning process in the study involves fitting the various parts and constructing a whole by perception. This argumentation process can be understood by seeking Gestalten (whole). In general, in studies with phenomenology approach, the view and how to deal with the reality is different from traditional argumentation methods. There is not a single reality in these studies. Realities are based on perceptions that differ from person to person and may change over time, and what we know and understand have meaning only in a given situation or context. Therefore, what makes the selection type of the design method with this approach is different from other studies.

This study is based on studies and environmental data in and given the primary objective based on the phenomenological approach, the quantitative measures will be exploited. In later parts, which is the design process path, data will have a qualitative quality and finally, the design process model with phenomenology approach will be presented.

LITERATURE REVIEW

According to Husserl, in order to achieve the objective and nature of the objects, any prior assumptions and theories must be neglected to face the “phenomenon self”. Phenomenon is what reveals itself in the consciousness and for Husserl, phenomenology was the method of understanding the nature of things. Husserl raised the term “lived world” (Dartigues, 1994).

Phenomenology recognizes the reality of phenomena, to explain how the objects appear. In Descartes view, “image”, “perceptual essence” or “an icon” is only

possible in the mind. Heidegger uses existence as “internal light” so that with it, we become aware of concept of “human” self, own existence and existence itself. Thus, we become a human reality and through that we are introduced to ourselves. Husserl’s thought begins with consciousness based on phenomenology and emphasizes the starting point of thinking and believes that an intellectual can overcome the tendencies and rely only on certain contents (Husserl, 2007). According to Merleau-Ponty, phenomenology reveals the world. According to him, human beings directly achieve existence and reality through perceptual consciousness. In his opinion, through the phenomenology of perception, achieving other levels of experience such as phenomenology of the reality between minds as well as the phenomenology of morality, religion and aesthetic experience are also possible (Merleau & Ponty, 2005).

The literature review is considered in the sense that with what approach can we deal with the existing phenomena. This view will be of the purest forms of individual’s sensory experience in existing in the environment. In this regard, we will review the effective techniques and tools in this direction as far as it helps the issue in explaining the way to transform the phenomenon to matter in the design process.

DESIGN PROCESS

The design process can be defined in various ways and with different generalization capabilities. The process consists of a range of activities that each has its own character and results. The design process can be divided into two main parts of epistemology of design and design method and each of these two parts can be discussed regardless of priority. Therefore, examination of the different parts of the design process in the cognitive areas include: design philosophy, design psychology, design modeling, logic, grammar and epistemology of design.

COGNITION PHASE

Designers believe that some types of information, even if they do not have any impact on the original idea of design process, should be exhibited. Thus, how designers conclude from the information and apply it to the development of design paradigms is an important part of cognitive endeavors in all phases of the design process (Lang, 2002). One of the methods for designing data analysis is to compare different situations with each other. In this regard, using statistics help a lot to analyze the data. Today, designers have employed



various techniques to help understand the relationship between variables. In these methods, designers explain the relations between the study variables through listing various situations, classifying them and determining all possible combinations of variables. If the number of variables increases, the variables resulting from the combination of them will be multiplied (Lang, 2002). Synectics is one of the methods, similar to intellectual theoretical procedures, which helps designers search in their conscious mind. Using analogies, metaphors and similes, synectics makes the mind free from traditional ways of thinking (Broadbent, 1973, Koberg & Bagnall, 1974).

In phenomenology of sensory perception, it is shown that there is a single, focused cognition, hence no difference between thinking and sensory perception, because it is based on a punctual self (Ponty, 1962). Sensory perception is a process that starts from the reality of physical and chemical stimuli of the environment and ends with the human reaction and psychological analysis that makes him compatible with his environment (Barati, 2011). In fact, “environmental perception” occurs from the interaction of “sensory perception” and “cognition” that have been experienced in the human mind. In this process, the role of the environment is noted as a key factor in the growth, development and finally, learning (Motllabi, 2001).

During the design process and cognition with

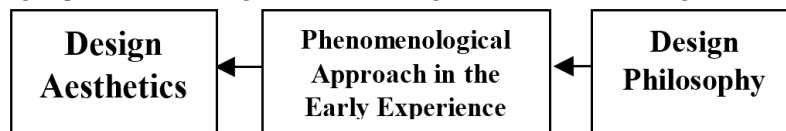


Fig. 1. Diagram of the Design Philosophy Path of Subcategories of Cognition Phase Design Psychology

Environment has the potential to provide human experiences and behaviors. Environmental information is obtained through perceptual processes, which are motivated by means of mental schemas and driven by human needs. These schemas are partly innate and partly learned, and link perception to the cognition. Schemata not only drives perceptual processes, but also emotional reactions (emotion) and actions (spatial behavior). In contrast, these processes and reactions influence the mental schemas as a result of perceived behaviors. Emotions and human actions are limited by the natural and built environmental capabilities of cultural environment and inner character of people (Lang, 2002). In fact, perception and cognition are two separate

perceptual approaches stage, due to the participation of different people, intuitive-emotional types are suitable for explaining the target and intuitive-thinking types are suitable for explaining the issue. The best people to carry out the selection stage are probably of sensing-emotional types, but the final decisive design criteria is up to the individual or group that has the power to decide (Lang, 2002, p.82). However, the most important part is the proper cognition and careful analysis of qualitative and quantitative data done by a person by means of different techniques and tools. Design philosophy, design psychology, design modeling, design logic, design grammar and design epistemology including are what can be guiding in the cognition of the design. In turn, these items each have subcategories that sometimes in the field of cognition make themselves more visible.

Design Philosophy

In phenomenological studies, the selection of philosophical approach is one of cognitive factors affecting many stages of the plan from the first step to the final point. In fact, phenomenological approach to the subject of sense in a study invites the designer to have an initial encounter and merely understanding it in the early experience with the environment and this will be the origin of a particular aesthetic in designer’s view. In fact, by studying the design philosophy, study of the ways of thinking is considered in relation to the design and the general attitude to it and general orientation to the design.

concepts. In environmental psychology, the relativity and intertwining of perception, cognition and environmental conditions are emphasized and this continuity is especially revealed when we separate the perception of objects from perception of the environment (Mortazavi, 2001).

In psychological study of the design, this issue is raised that when a new architecture with a location is fixed in space and time, it is better to create a mental link and memory with the site (Porter: 2005). According to Maurice Merleau-Ponty, feeling is a familiar word in ordinary language, and this concept is “immediate and obvious” at first glance. However, when it is moved into the realm of psychological theory, in fact, there is nothing more important than it (Carmen, 1997).



In such designs, by meeting with the rational and emotional issues of the design, the designer tries to discover hidden meanings and pay attention to the objectivity of things in order to guide the design in a progressive way.

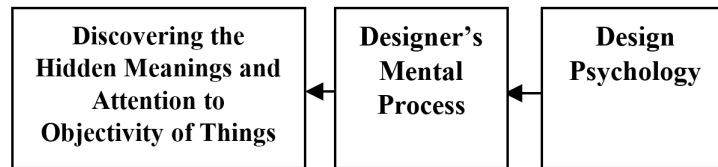


Fig. 2. Diagram of the Design Psychology Path of the Subcategories of the Cognition Phase

Design Modeling

Many people have tried to obtain charts for the design path from beginning to the end. But it would appear that the design process is not predictable and the paths would be different with regard to the adopted methods (Lawson, 2008). Using behavioral and social models and yet, making

use of humans and environmental related perceptions and combining them together will lead the researchers to develop a model of his/her own design based on which, the design data have been analyzed. These models will help designer in the selection of objective and subjective modeling tools and their utilization.

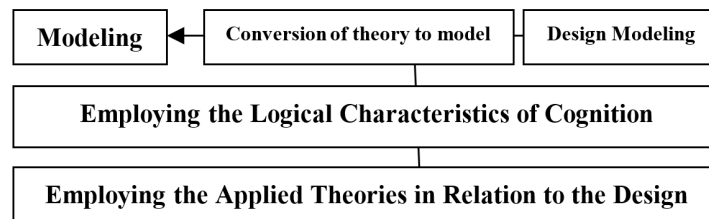


Fig. 3. Diagram of the Design Modeling Path of the Subcategories of the Cognition Phase

Logic, Grammar and Epistemology of Design

Using the model of environmental material discovery in the modeling of spatial experiences, using patterns and discovering sensory infrastructure and defining them, noting the regional characteristics and exploring the environmental potentials, perception of measures at different levels and natural and revelational experience are important as the foundations of philosophical approach to the issue and investigation of effective factors in the design is done on the basis of these criteria.

To create a sensory-emotional atmosphere and capture the full human existence, creating architecture should be viewed with a different viewpoint. Peter Zumthor as well as Sigurd Lewerentz and Aldo Van Eyck can be considered among architects whose works reflect the deep human feelings and capture the full existential nature of the audience (Pallasmaa, 2013). Zumthor himself confirms this and states that he is seeking a “sense” in space that is beyond the composition principles and formulas.

He believes that: “an architectural work can only have artistic quality when the combination of form and its content creates a powerful atmosphere that can affect the audience (Zumthor, 2015). When this effect is complete, the work captures the whole nature of human existence, including his five sensory perceptions (Zumthor, 2015).

This is when it can be said that the architect can link the surrounding phenomenon with the built subject through the use of design logic, and with the rules that he defines for the design and with the precise knowledge of materials and environmental qualities.

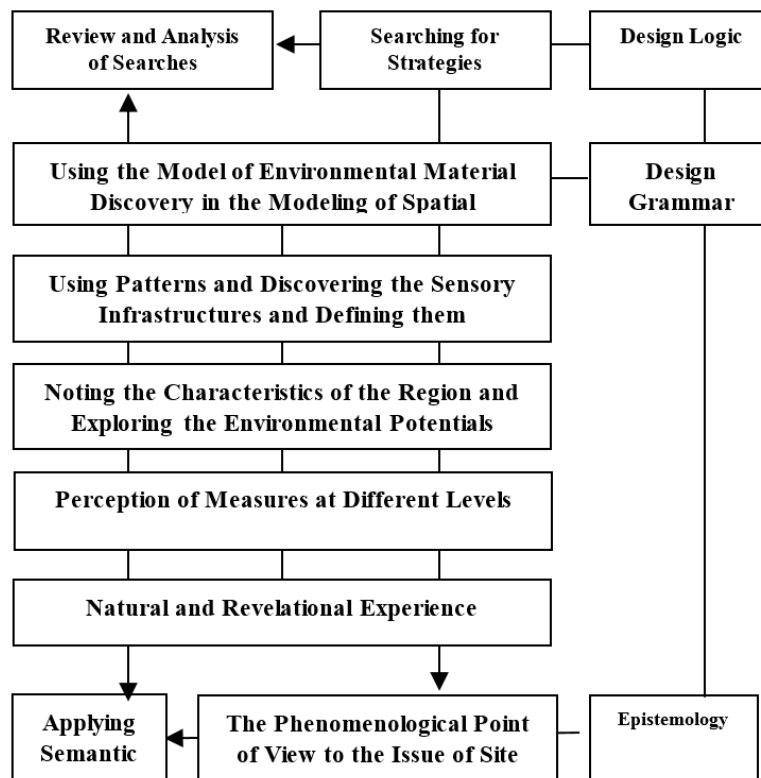


Fig. 4. Diagram of the Design Logic, Grammar and Epistemology Path of the Subcategories of Cognition Phase

DESIGN METHOD

One of the most important parts of a design process is the selection of appropriate method to achieve the objectives of the design. Hence, a careful examination of basic information on the epistemology phase and correct analysis of them and how to nurture them by the designer in this path is noted. In this way, study areas such as design knowledge, design tools, design techniques and design rules and its sub-divisions are noted.

Design Knowledge

The main criterion for selection of design method is the design knowledge. In this study, criteria are measured based on initial cognition and dealing with the issue, returning to the phenomenon itself and actually understanding the phenomenon and the environment. In the process, utilization of the perceptual and sensory characteristics of phenomena cognition and exploring the phenomenological properties of the site and its conceptual strategies in a mental process through the use

of mind stream and synectics and inspired by the physical elements of the environment, forms the link between the phenomenon and material.

Today the multi-sensory design of environment and architecture of senses have been proposed by theorists such as Pallasmaa as an idea to restore balance to adverse environments of today (Shahcheraghi, 2015). In the present study, the process of human's encounter in a phenomenological approach to the environment and how he deals with the object is important. The body as the important and interface element of perception carries out the process of information transferring from the environment to proper mental ideas and schemes which there is a link between the phenomenon and the matter. This section establishes a link between the phenomenon and the matter and if the architect can well understand it, a large part of the design process will be done with sensory approach.

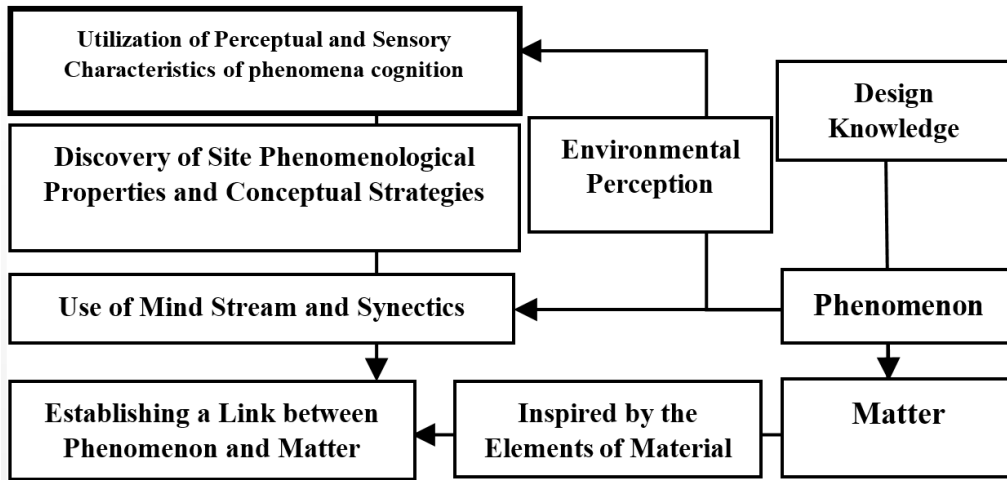


Fig. 5. Diagram of the Design Knowledge path of Subcategories of Design Method

Design Tools

Being in the world is being an object and like all things in the world, it is the material or physical being. From sensory point of view, we can say all kinds of physical objects are “understood”, however, only those that are equipped with different types of sensory organs which respond in specific ways to certain types of stimuli; light, sounds, and likes of them are received from surrounding objects (Mathews, 2010).

In such designs, selection of helpful tools in the design process is carried out based on scientific and sensory criteria. In the analysis of quantitative data and to accurately assess the quantitative and to some extent qualitative criteria of the environment, survey tools such as observation and interviews, and in data analysis, software, are used, and in the intuitive and sensory part of the design, utilization of specific objective and subjective techniques which will be discussed in the techniques section, will be cited.

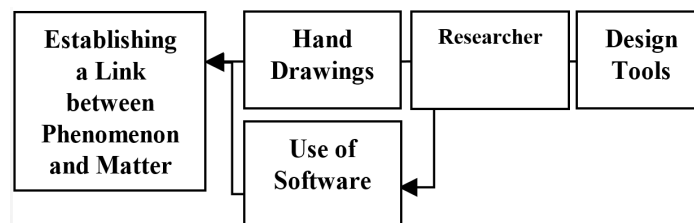


Fig. 6. Diagram of Design Tool Path of Subcategories of Design Method Phase

Design Techniques

In the communication process, the first step is sense. At this stage, environmental information is received through the five senses and based on the sensory capacity thresholds for each of the senses and takes the form which is transmittable to the brain. (Pakzad, 2012). In such designs, defining the relation between phenomenon and matter is carried out using techniques such as metaphor, physical model and conceptual diagrams and with the help of various techniques such as mapping and based on

software data analysis.

In this article, we will discuss one of effective techniques used in the design process in relation to the environmental qualities and quantities. Dealing with environmental information and gaining knowledge that can help us achieve architectural qualities is one of the most important parts of the design method. Mapping technique can be a perfect solution to achieve immeasurable qualitative values in the form of quantitative measurements in the environment.

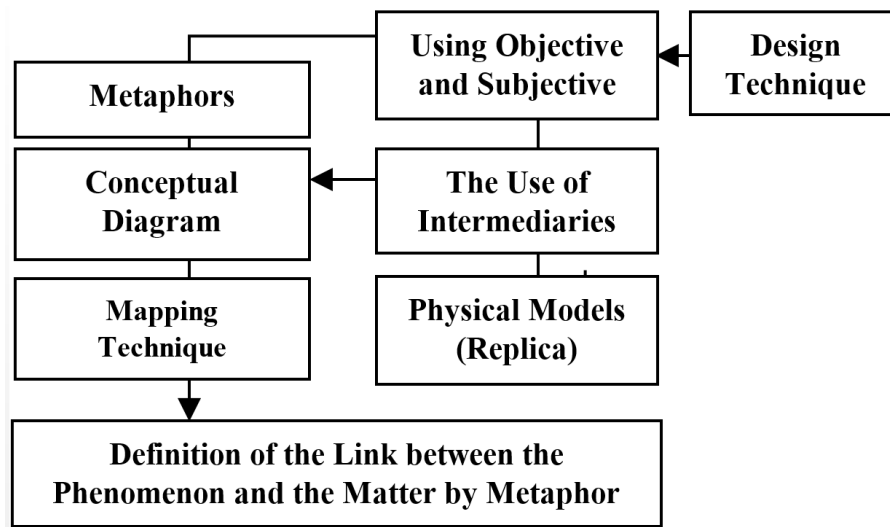


Fig. 7. Diagram of Design Technique of Subcategories of Design Method Phase

Mapping Technique

In fact, the practice of this technique is as following: creating a qualitatively different points from smell, sound, light, pollution and the wind speed aspects and the factors influencing them, as well as review and analysis of positive, negative and in-between points. In this method, data is analyzed based on statistics and measurements of environmental quantities and qualities by the software and is conditioned based on fuzzy logic and ultimately, it faces the designer with the intended qualitative points and in some cases, with different sensory corridors.

• How to Achieve the Sensory Qualities of the Site

Given that in phenomenology of the built environment, receiving sensory data and converting them in mental processing and representation process, and association with meanings, plays an important role in addressing the environmental cognition and sensing it will be of importance (Pakzad, 2012).

During the design process, selection of appropriate method to achieve qualitative and quantitative different sensory points on the site is intended; in reviewing a sample case, the conclusion of this technique is based on preliminary environmental data based on the measurements by odor density meter in different parts of the site. Points in the site are selected randomly and in some cases, based on the topography obtained by GPS and in some other cases, on the basis of the designer's

opinion. After measuring the density of odor (olfactory charts and qualitative assessment have been done in positive and negative cases), the data are transferred to Arc GIS software in the form of tables and were analyzed based on the IDW method and points are provided with different classifications. This operation was carried out for other qualities such as sound (noise pollution) and their direction which was affected by factors such as wind and the results were obtained accordingly.

In the study, environmental qualities such as prevailing wind direction and its impact on different seasons and how it enters the site and wind's point of impact at present condition is studied and the results will be taken into consideration in the future design. In this context, achieving different sensory corridors in the site and depth of their influence have been considered and specific points with positive and negative qualities have become the standard practice in form analysis.

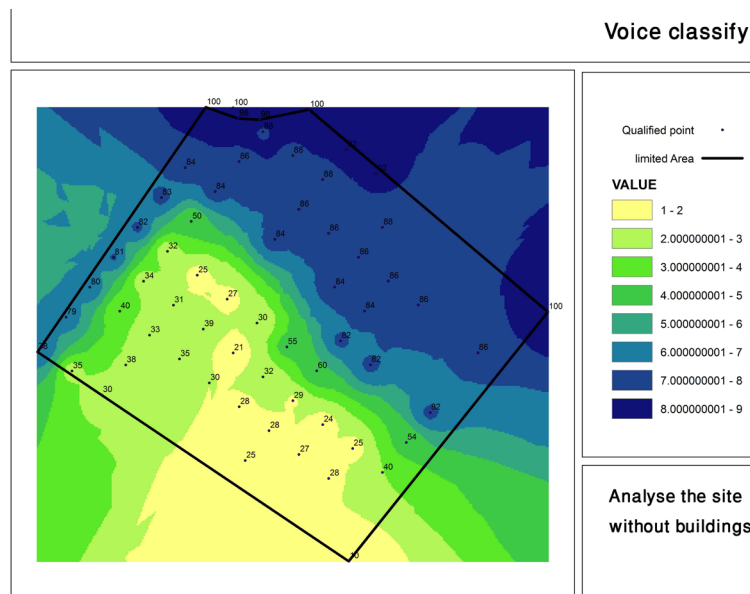


Fig. 8. Site Analysis in Terms of Noise Pollution (Example of Information Recorded from the Site by Mapping Technique)

• How to use intermediaries through mapping technique

As mentioned in the previous sections, the tables and charts are derived from various surveys and using mapping technique based on many points with different qualities and ultimately, the combination of these qualities and their effects will show paths to the designer which are in fact, the optimal paths and zones. In the interpretation of such designs, two essential points should be considered. The first priority is to find sensory qualities in the site and define an origin and destination for them and the second priority is to define and design a path in order to achieve the optimal point and from another angle, designer's attention to user dealing with the issue is considered.

In order to explain the issue, we will need the help the intermediaries such as metaphor of "journey in the phenomenon in order to get to the matter". Since for traveling, the origin and destination are required, finding the origin and destination in a mental process in the process in different points with different qualities demonstrates itself as a repeatable form and representative of different sensory events of site. This comparison shapes the architecture itself; such that defines many source and destination points that will show their paths. In order to build a new concept in relation to this definition that expresses design's requirements, source and destination terms in designs are introduced and the path from

phenomenon to matter is formed; and of this basis, the original idea will be formed.

This is the trend of phenomenon to matter that in designs can determine the sensory corridors and give existence to the architectural form. Repeating these sources and destinations will give the perception of the environment.

Conceptual Diagram

From Husserl's view, perceptual analysis is the "analysis of the nature". So, for all imaginative perceptions, it is generally true; in other words, they form a truth with "substantive whole" (Husserl, 2002). In order to achieve this goal, two main criteria should be considered. First, how to record environmental data to properly present the sensory qualities of the physical environment to the designer and second, how to deliver them to be recorded and converted to presentable qualities. In order to achieve the desired aim, designing related linear diagrams based on data obtained from analytical technique is one of the techniques that will ultimately determine the main design paths and can act as an intermediary.

Design Rules

In this part of the method chosen by the designer, masses with different scales are laid out according



to the existing qualities and on the other hand, using semantic knowledge, transition of hidden meanings in the environment such as light, color, smell, sound, etc. are done in different ways. On the other hand, with regard to the definitions linking the phenomenon and matter and by defining conceptual frameworks related to the design, different qualities are created in a phenomenological

experience in the link between the project and site in a physical and metaphysical perception which can help the designer in presenting the basic rule of the design and building the design idea.

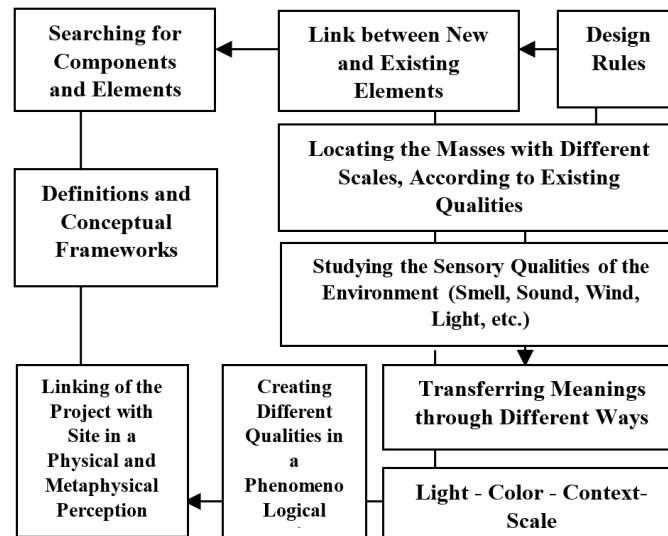


Fig. 9. Diagram of Design Rules of Subcategories of Design Method Phase

FORM DETERMINATION

In projects that are directly associated with the phenomenon, instead of realizing the design concept in a neutral vacuum, the designer carries out his architectural process in a non-neutral space that forms a whole for the architectural element from the intensities of moving sensory variable and perception of the environment.

According to the analysis and evaluation of such samples, in order to achieve the desired points on the site, it seems that forms shaped on the site must be under the influence of environmental forces in a certain way. Selecting the main form based on the increase and decrease of sensory qualities in different directions is raised in perceptual preference and the direction of the forces on the building is obtained based on the analysis of raw data and analytical results.

Finally, the output of the architecture is a representation of using surfaces with regular graphical joints which can be considered as a texture: a texture of color, sound and a tangible and comprehensible texture of speed.

DISCUSSION AND CONCLUSION

Presenting an analytical model that can show the path of converting phenomenon to matter with phenomenological approach to the issue of perception by mapping techniques is the main objective of this study.

According to the conducted studies, a model for the design process with phenomenological approach is presented. Before detailing this model, it is note worthy that in most parts of the model, there is no transposition of the selected phases by the designer. It is also important that a part of the presented model may be neglected by the designer; in fact, the process of converting a phenomenon to matter, according to various studies mentioned in various parts in general and detailed form, is as follows:

- The main basis for design is based on phenomenological approach and dealing directly with phenomena, and in this path between the cognition and needed selection, in addition to the sensory approach to the issue, argumentative approaches are relied upon.
- Analysis of the site and exploring the sensory capabilities of the space by mapping techniques and



assisting tools in the provision of quantitative qualities of the site and the use of similes and metaphors in the transformation of quantitative data to qualitative data and presenting them in the form of the conversion process from the phenomenon to the matter will be the perfect solution in reaching the final design.

To determine techniques and procedures of the study, the sociological phenomena, there is no prescribed instructions beforehand. In fact, they are exposed to the series of reciprocating measures (feedback) and push the researcher to the study phenomenon. This type of study requires a creative approach of methods and techniques. So, in general, the following can be utilized in formation of form based on phenomenological approach:

- The main goal of these projects is the formation of the architecture based on the deep sensory perception and

meeting the nature.

- Another indicator obtained in the process of analyzing these projects, is the subtle and yet profound cuts that the forces on the site have created and act as the sensory corridors.

- One of the most effective techniques, is mapping weather qualitative points of the environment and turning them into favorable and unfavorable points or sensory corridors to achieve the goals of the design.

Finally, regarding to the discussions, the model presented by the authors reveals the path chosen by the designers in designs with phenomenology approach to the issue of sensory perception. As mentioned earlier, there will be no priority in selection of each section of the model by the designer.

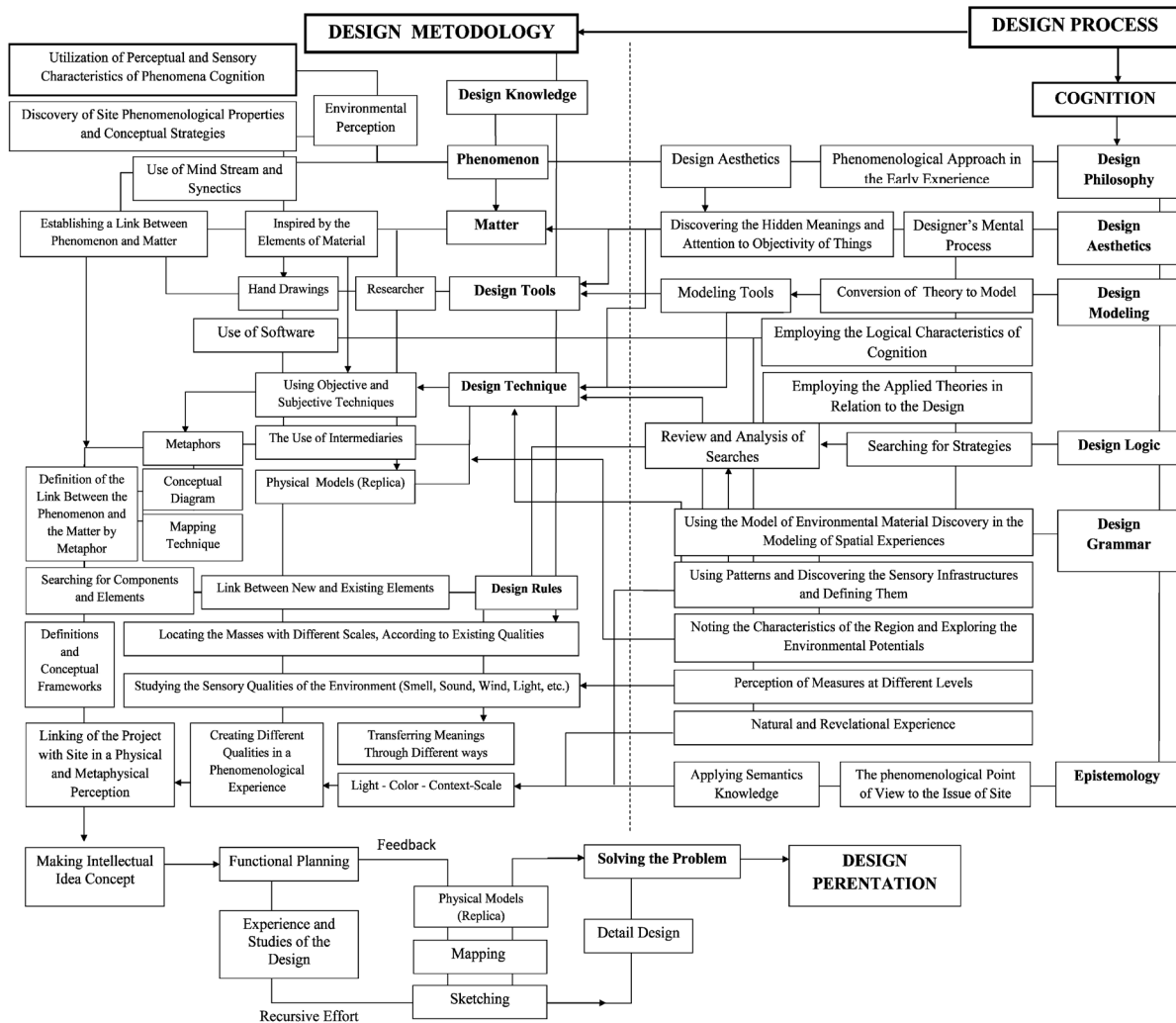


Fig. 10. Provision of the Analytical Model of Phenomenon to Matter Conversion Process Path with Phenomenological Approach to the Sensory Perception.



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