

**Order Out of Chaos
In The Process Of Architectural Design
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ABSTRACT

Architectural design is and has been an amorphous process. The synthesis of design is an individual representation of how that individual was trained and or has developed his or her notions and philosophies about solving design, processing information and realizing architecture. Architectural design is normally viewed as an end product with the merits of the conclusive whole being evaluated and critiqued without association to the process that beget the architecture.

With more and more complexities being added to the project requirements and with the need for improving efficiency and quality of architecture, these goals must be evaluated in the process of their evolution. The process can be better defined to enrich the architect's outcome. With these considerations and with the consideration to integrate new comprehension of dynamic mechanisms to unify the problem solving evolution, a new process paradigm can be established. The new paradigm emerges as a model to direct progression toward a more orderly and well conceived outcome. The purpose of this model is not proposed as an idealistic revolution to standard procedure, but acts to insure that order emanates from chaos in a fashion relevant to current understandings in science and to the spirit of human physiology.

Key Word Search: Architecture, Design Process, Architectural Methodology,
Architectural Order, Architectural Design Paradigm

Order Out Of Chaos In The Process Of Architectural Design

1.0 Introduction

The designing architect's days are made up of a continuous process of decisions. Decisions like, how the context of a particular site will fit the circumstantial conditions that are client directed or whether the funding allocation will be sufficient to manifest architecture that is practical yet expressive. There is weighing of diverse information and decisions to be made from the profuse complexity of multi leveled variables that are conceived or that simply arise. The way and the order in which considerations are faced by the architect will rationalize the chaos or cause further disarray. The business of architecture suggests efficiency and timeliness, while the art of architecture requires the quality of understanding, consideration and integration. The architect performs amid this dichotomy. There is the realization that the practice of architecture is the selling of time and therefore, it is necessary to minimize its use throughout the project.. Design should proceed with fluidity from inception if to overcome the loss of profit. On the other side, it is critical that the architect's work, his or her problem solving ability is conducted in such a way as to maintain image and promote a particular dynamic that captures commissions. To Balance this dichotomy, a synthesis process is necessary to direct actions and initiate process.

Each architect is capable or incapable as the condition may be, of dealing with the variables and the conditions that underlie architecture. Decisions, as individual entities of the entire design process vary in quality and precision. No two design processes are identical. No two architects accept the circumstantial project conditions equally or deconstruct and reconstruct information exactly in the same way. Architects differ in psychological sensitivity, philosophical character, experience, training, education and methodology to name only several influences upon final reasoning of design. Architects are motivated by enigma in varying ways. Accordingly, design will emerge with differing qualitative values.

A prescriptive model will never be the answer in riding the limitations and extremes of process methodology and architect characterizations. A prescriptive model imposes predetermination and there is no place in architecture for that type of imposition. Architecture will always remain art even though it comprises science. In art there is need to retain spontaneity and uniqueness that prescription would cease. A descriptive model will also never be practical. Description supports classification and as time has shown, there are many classifications of architecture. Classifications that continue to modulate and change with time and the imposition of what time will bring new to the table of articulation and technology may require complete departure from former classification. This is not what the architectural profession should seek. What should be developed, is a paradigm that associates those considerations that are meaningful in moving architectural design from chaos to order. A design paradigm

that assures incorporation of balanced ingredients and harmonious blends of that which negates the cacophony of disunion. The process paradigm might be thought of as the guide to wisdom in architecture, where understanding that the integration of opposites are not departure but continuity. A guide to progression and process in architectural design, is a precursor to assuring that quality in design is maintained. This type of paradigm will bring about a unified order to the whole of architecture and to the architectural profession.

Overview

This investigation will reiterate concerns for contemporary architecture and will uncover the identity of architectural processing mechanisms that unify design. Aspects and parameters will be discussed that better enable the synthesis of complex variables in architectural design process. In all, a unification based on the nature of all things will unfold to provide a copula of logic. With this path toward dissecting significance in the architectural design process a usable paradigm will be born to guide the architect through chaos to order.

2.0 Architectural Design

Humans move through their lives with a preponderance of attention on the physical reality. Reality is perceivable through sensory perception and dominated by ones experiential awareness be it conscious or unconscious interaction. Existence is a constant measure of the reality experience. Human nature involves assessment and assimilation of the environmental stimulus. The mental processing of this stimulus may be deterministic as in realism or indeterminate as with idealism. The truth of reality may be that there is no exacting truth, only perception conditioned by the individuals physiological makeup. The challenge of architects is to meet the demands of diverse interpretations of reality in architectural design. The built environment represents and defines the activity and level and quality of interaction users commonly perceive as reality. The architect is responsible for establishing this environmental reality. "While man is now known to have vastly more sense receptors than the traditional five, all of them together still deliver one combined message of a world truly indivisible. The current physiological view of our being makes man one." [1]

2.1 Formation and Essence

Architecture is the foremost source of human poetics. Architecture is environment. It reflects the composition that defines or at least affects all human thinking, mental reasoning and behavior. The poetics of architecture derives from composing and structuring perception which is the environmental reality. The architect facilitates the progress of human development in this way. This development may be aesthetic and romantic or functional and scientific. The culmination of architectural design converges processes into suggestions, visions and

concepts of future that the interactors of the architect's space cannot escape. In essence, architecture conditions the human experience, the architect is able to reach beyond the observers realism or idealism and overlay a sequential assortment of stimulus parts representative of the influential whole. Architecture becomes a representative continuum of space-time, while architectural design is the formalization of this continuum.

2.2 Manifestation

"Space is the stage on which design performs. But every performance is also contained in time and its results extend within it." [1] Architecture must express the reality of perception even if understanding of the perception is beyond the comprehension of those experiencing it. There should be a parallel relationship between experiences in physiological related space and space that is created outside of the body. The physiological space involves the human body. The human perception brought about through senses, the anatomical features of the human, the functional elements of the human body and the like are physiological characteristics that govern environmental design. For environment to properly serve awareness, the architect must engage in design processes and reasoning that correlates with the human physiological experience. Therefore, architects must maintain current understanding and be knowledgeable of scientific discovery that furthers their perception of environmental reality. Prior to the modern movement in architecture and prior to the accomplishments of Herman Minkowski and Albert Einstein, architecture reflected the conventions of space derived from Euclidean geometry and Newtonian space. The classical ordering of architecture was devoid of the integration of time with space. Space was conceived as non directional and was misrepresentative of the human physiological experience. Today the manifestation of architecture is to be responsible for balancing the relationship of environmental reality to physiological experience in space and time simultaneously. This truth relies on the architect's comprehension of the space-time continuum. As humans interact and immerse themselves within the architecture, they experience the space as defined by the architect to "promote endeavors, elicit responses and communicate meaning". [2] Humans experience through sensory perception and recognition of the physical elements (physiological nature) by experiencing the composition sequentially in time. [1, 2] The experience is achieved reference frame by reference frame.

The information based world we live in today requires constant assimilation of discovery. Perception is multivariate and changes with the dissemination of new information and technology. Manifestation of design in architecture carries with it the necessity to examine new information and to extract its value. Architects must meet the demands of discovery and change and find new means for assuring adequate product that serves the client. The need for a new design paradigm emerges.

The manifestation of architecture through design must encompass a process that will assimilate diverse and variegated information into meaningful decisions regarding the physiological nature of humans. A singular heuristic approach to design will not provide the essential effectiveness needed to integrate the multivariate fuzzy logic over traditional dichotomy. The world has reached the age where "Everything is in flux." [3] There is nothing that is 100% true or 100% false. Traditional dichotomy is dead. A paradigm shift from black and white to gray is upon the world as it is upon the architect. "Today's thinking habits cannot be based on word-play or belief systems but must be attuned to the latest developments in neuroscience and matched to the way the human brain creates perception." [4] Edward deBono, [4] describes the need for a New Renaissance in Thinking, whereby scientific reasoning (rock logic) and creative reasoning (water logic) are integrated in what he refers to as 'provolution'. deBono suggests, that, "rock logic, emphasizing rock 'is', constitutes hard-edged, permanent and unchanging reason synonymous with classical identity/contradiction logic and is readily dispersed as critical thinking. Water logic emphasizes 'to' and flows along a gradient (context) and it takes the form of the vessel in which it is placed (circumstance)." [4] He believes traditional logic is antiquated and that decisions stemming from bivalent interpretation (right or wrong), biased in the objective process by personal preference on one variable. deBono urges the use of a new paradigm that will convey the reality of human perception and mental processing more correctly.

"Logical thinking [classical reasoning] is thinking based on proposition and on consideration of the truth or falsity of propositions. Its primary usefulness is in situations where facts can be relied on to remain facts - in other words, in circumstances where nothing really new or unexpected is likely to happen." [4] Today, there is a rapid acceleration of change in the world and the practitioners of business, economists and politicians to name a few, continue to practice classical logic, limiting the opportunity for new discovery that may induce more responsible and permanent solutions. There should be greater acceptance of creative, inspiration generated questions and answers. Serendipity has been the catalyst for many accidental discoveries not being sought in science and other objective based fields. It is with this pretense that the classical minded individual should be prepared for the chance favor. [5] Knowledge and critical thinking are not enough, cleverness of traditional thinking systems lack the quality of wisdom. Problem solving cannot be solved by objective rational alone. There is the need for balance between intangible reasoning and tangible reasoning.

In a slight juxtaposition to business, politics and the like, architectural thinking processes tend to rely on water logic and relinquishes the need for propositional knowledge. The balance toward human perception in architectural design may be distorted by excessive creativity and lack of tangible objective reason. A new model for architectural design, infusing positivistic science (science based on assured fact) in

the design process is necessary to manifest a responsive built environment, equating design to the physiological perception of humans.

2.3 Feeling and Cohesive Order

Making decisions in the architectural context is an amorphous process. There are no rules or accepted paradigms that generate design. No crystalline methodologies that can move design from the unknown to the known. The architect must force rationale upon the chaos of alternatives that is before him during the initiation of design process. Where is design among the various parameters and possibilities? What ignites the emergence of rationalizing the chaos? If there are no paradigms to follow that initiate a stepping procedure to deduce the unknown to vision, then where is the beginning of design? The process of thinking through architectural design is incomprehensible process with varied interpretations and non formalized methodologies. Style and skill are nebulous terms defining the designers process from chaos to rational understanding. Bryan Lawson states, "Until recently designers relied almost exclusively on intuitive methods, and design ability was widely held to be innate and largely unteachable. Thus the educational emphasis was largely on product rather than process." [6]

The absence of reasoning processes, paradigms and systematic decision methods can not assure responsible conclusions to architectural design and conveys no empirical trail for assessment. In this regard, design appears to be conceived out of some mystical capability of the architect. "To regard thinking as a skill rather than a gift is the first step towards doing something to improve the skill." [7] The apparent affinity for rationalizing design chaos into order is a very useful capability in processing the architectural design. But, To say that this affinity is born in the nature of the individual architect would be a mistake and to assume that this rational occurs out of chance lessens the value of architecture and architects. Accidental occurrences of design is conjugal to irresponsibility by the architect.

Louis I. Kahn's architectural design philosophy is motivation to the disenchant designer attempting to speculate on design methodology. For example, the designer may ask, where or how shall I begin? Kahn provides comprehension of the process and elevates architecture to a respectable endeavor by coalescing the architect's inspiration and creative instinct with the thinking processes of scientists. The emergence of design from this process conveys an enlightened intelligence of architecture and for architecture. Kahn creates an indelible urge to unify creativity with objectivity.

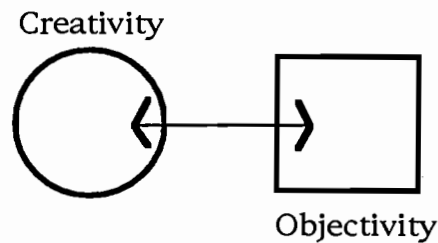


Figure 2.0. Continuity Among Opposites.

Feeling, as Kahn asserts, "Is the way in which an idea comes to a person out of the blue; it is suddenly there, but its origin is inexpressible." [8] He spoke of beginnings, devoid of thinking and prescribed knowledge, exploring possibilities in a flow of mental processing and realization that could not be articulated, except to say, *I sense*. "When Kahn spoke of feeling, he spoke of his preferred mode of functioning." [8] Though he reveled in the depths of personal emotion as a means for generating ideas, "...[H]e had also learned the value of thinking rationally, of putting his ideas into cohesive order" [8]. Thinking versus intuition was the objective reality infused in rationalizing theory and testing validity. "Kahn believed that the mind intuitively understood the design process as a whole but required the help of rational thought to direct the process by separating it into steps." [8] This belief is in agreement with Edward deBono's view that, "...[T]he brain [i]s a self-organizing system." [4] Kahn recognized thinking as a tool to articulate feeling into expressible shape.

The conjugation of rational thought and creative intuition into understanding, is described by Kahn as "realization". In Zen, "The flash of this unifying experience, [is called] *satori* ("enlightenment" or "insight")", in Hinduism, the relatedness of all things is expressed as *tat twan asi*. [9] The human aptitude Kahn practiced as feeling and creative intuition, Eastern culture recognized as wisdom. The thinking and objective reasoning that Kahn learned to integrate in design process is considered knowledge in the East. "Wisdom is [said to be] a putting together, knowledge a taking apart. Wisdom synthesizes and integrates, knowledge analyzes and differentiates. Wisdom sees only with the eyes of the mind; it envisions relationship, wholeness, and unity. Knowledge accepts only that which can be verified by the senses; it grasps only the specific and the diverse." [9] At the point of fusion between wisdom and knowledge there is cohesive order or union in the process leading to understanding. When there is understanding, there is meaning.

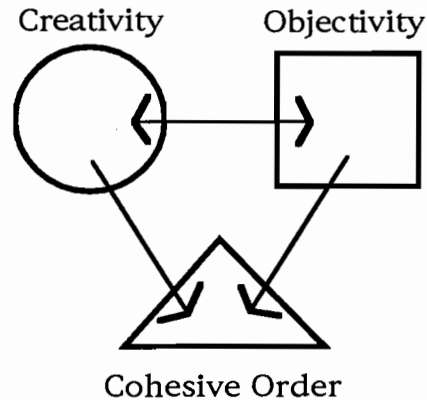


Figure 2.1. Reaching Order Through Complementary Opposites.

2.4 Order, Form and Design

The macroscopic level of the world, of the universe follows an embedded nature and order intrinsic to human understanding. So too, does architecture follow a nature of underlying order that is intrinsic to the architects awareness. "In architecture, the order of structure is the sense of the intrinsic capabilities of building materials (brick, concrete, stone, wood) and elements (joints, supports, openings, rooms) that fit together and form themselves into characteristic shapes." [8] The architect must facilitate this ordering process to define conceptualization, purpose, function and objective into forms that reflect the intrinsic order of architecture. The architect must process the variable input data of diverse sub parts of what architecture is and allow the individual qualities of each component to speak its identity and attain its place among the collaboration of architectural elements. The architect through architectural knowledge (know-how), to be discussed later, knows the will of these components and feels or senses them as viable collaborative parts to the whole. Order is the understanding of relationship among the parts.

When order of particular sets of variables in the architectural context are evaluated for their individual effectiveness, then relationships can be formed to the composite whole of architecture. Relationships among the variables such as structural elements and light and shadow can then help to define form. Form is not molded by circumstances of the project, program or other particular conditions. Form implies the very elementary abstraction of elements and thus at this level of thinking form is intangible. Form can also be recognized at a perceptive level, not abstracted, and can be described in a tangible realm of understanding. There exists different levels of comprehension. "The conception of form is not unlike human conception, when the disparate yet complimentary elements of egg and sperm fuse to initiate the growth of a new and unique life." [8]

Design is the evolution of form. Design is tangible and emerges from form. Design is the tangible representation of circumstance that characterizes building. The design signifies the essential objectives, purpose, human physiology, function and all other specific criteria of the project as a whole. "Order acts as a catalyst to help the form archetype [the form carrier] become a design reality." [8] From feeling (idea) to order to form and then to design is the formation of the first model process that is essential to sequencing an architectural reality.

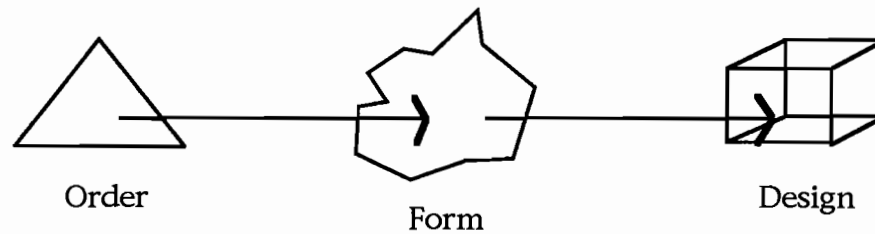


Figure 2.2. Process Evolution.

2.5 Intuition and Rational Theory

Intuition and rational theory involves the transition point toward cohesive order. A decision is weighed intuitively and with rationale. As the parallel balance of creative criteria and objective criteria run their course along the path of time, there is a point where intuition and thought (as rational theory) converge or operate in union with one another. This meeting point can be seen as cohesive order in the process of evolving decision. The decision can be of any type. The balance between the intuitive nature and objective reasoning make the decision integrative with reality and comprises a cohesive order. It should be noted that if intuitive faculty is preconscious then thought occurs in a conscious state of awareness. Intuition comes forth from no apparent physical activity. Thought however, is a physical process centered in the activities of the mind. The union of these two human aptitudes is a powerful dynamic in reasoning.

3.0 Processing Resource Information

In laying out an array of variables for consideration and integration to the composite whole of architecture, there must be a processing of these variables before they can become valuable resources. The processing is in defining the individual characteristics that make each component viable for integration. What are the characteristics that define an arch for example? In knowing the essence of an arch,

arch can become viable to the composition or it may not. If it is found to be viable as component to the whole of a particular architectural meaning then, along the progression of design process it will be evaluated from an integrative point of view with other components for their combined relevance. Even further along in the progression, the arch if found viable and integrative will be articulated to speak in terms of the entire composition. Therefore, processing the resource information of individual components or variables to the design becomes significant in ordering the development of design.

3.1 Design Paradigms

"A paradigm is a schematic model for representing phenomena and relations among them. A paradigm is typically a more general conceptual system than a theory, in that a theory is designed to provide specific explanations, whereas a paradigm consists of terms and concepts shared by workers who do not necessarily agree on particular theoretical explanations." [10]

Architectural design is a complex process integrating a multitude of reasoned variables against an assortment of subjective and objective considerations. The process is an elaborate intellectual undertaking that is difficult to define. There are no succinct processes that the architectural profession or architectural educational perspectives adheres to. There are no great expectations that there ever should be a defining process or that it is the primary goal of the profession to establish such an interest. The purpose of proposing any paradigm or paradigm shift is to establish effectiveness in explaining complex systems. If in trying to establish a workable paradigm, the profession or members of the profession find it useful, it is a tool to the profession, a technology that will support design process and enhance the practitioners perspective of architecture. If a paradigm can aid in producing design that reflects better environmental reality as it correlates to human physiology then the value of the paradigm has meaningful measure.

3.2 Creative and Objective Relevance

A process or system in equilibrium, that is a system that produces the same outcomes time and time again can be seen as stagnate and in crisis. The complexity of architectural design, represents a nonlinear system. When a nonlinear system follows a course to adaptive equilibrium the system is in need of change to stimulate a new energy dynamic. The path or tendency of ever higher entropy must be countered in the expectation of change and process. By interjecting creativity into the system, new ideas, perceptions and relationships are born and the system will spontaneously self organize into critical points of interaction among the elements of the system.

The objective path of analyzing empirical data to formulate understanding, reason or outcome may be suited for scientific discovery but reduces the dynamic that is necessary to produce good design. In the architectural design process, objective

reasoning alone, if it were possible to produce such a system, would issue designs that are sterile, inflexible and prototypical. The creative element in architectural design is analogous to intuition, feeling or sense. These intangible ingredients in design process offer continuous conflict that evokes change and new ideas as outcomes. Creativity induces new chaos to the system that self organizes into a new dynamic.

The relevance of creativity is that it is mutually important in process systems as tangible objective quests are for producing the outcome of understanding and reason. "In the language of the scientists, chaos breaks symmetries, and this is an essential step in the emergence of new order." [11] The previous statement illustrates how scientific discoveries about the behavior of dynamic systems, now finds that creativity is equally relevant to producing new order from chaos.

3.3 The Nature of Decision and Design

Decision and design are equal in the sense that they are the result of procedural gestation. The question to be answered or the idea to be formulated are the result of ordering and formulating toward realization. Neither decision or design are spontaneous offerings if they are to be regarded as answers and solutions. To spontaneously make a decision suggests there was no need for decision but rather a conventional answer. If design is spontaneous, then it is not design that is sought but rather practiced standards. Design and decision imply process.

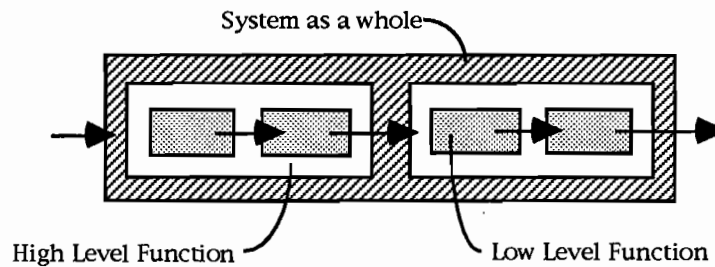
Design and decision are the union of complimentary opposites [9]. Decision is the process unifying the dichotomy that exists, right or wrong, blue or green. Design in similarity, unifies the science and the art of a thing. Design finds harmony among the elements of the whole by unifying intuition with objectivity.

Design is a form of problem-solving where individual decisions are made toward the realization of product.

3.4 System Behavior

The architectural design system emerges design in various states of development. The state of development is the referential vision or relation of the part to the whole. As the process of the design progresses the interactions of the parts are characteristic of the state of the design. Both the problems of the design and the realization of problem solutions become clearer as the state of the design further defines the cohesive whole of the design [6]. The synthesis of a design to some point in time represents the state or the defining condition of the design to that point. The general features which identify a state are, 1) Individual units of the design domain are distinctive and inclusive parts of the whole, 2) Individual units of the design domain hold distinctive value to whole, 3) The individual units of the design domain persist over some relevant time period. A system state that meets these three criteria is by virtue of the fact a description of the system as a whole [12].

Another way to envision the state of architectural design development is in recognizing or evaluating the interconnectedness of the systems, subsystems and components. The state can be defined as the integration of systems. Systems compose or supporting a vision of the whole. The boundary of the systems is the building development in progress. This is described by figure 1.0 and figure 2.0 [13].



High & Low-level functional organization

Figure 3.1. Unity Among Components.

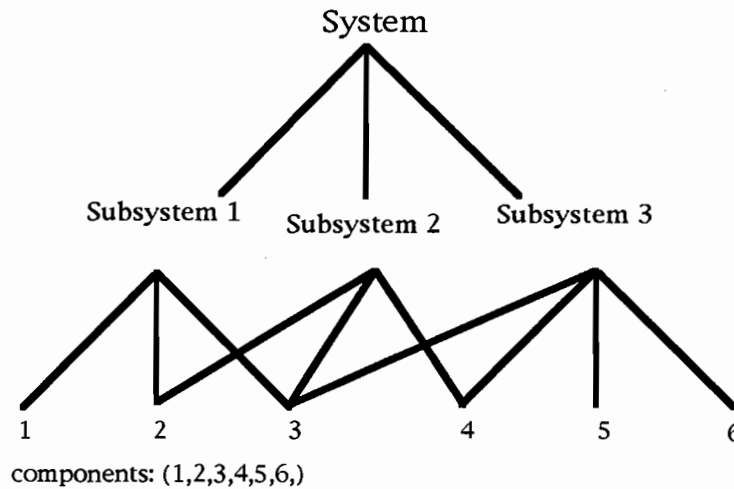


Figure 3.2. Beginning Component and Sub component Relationships.

4.0 The Romantic Intangible Preparation

The romantic characteristic of architectural design process has its beginnings in the Romantic Movement of the 18th and early 19th centuries. It defines the transition from neoclassicism and denotes the revolt against the objective classicism. Romantic suggest inspiration based thought. "[T]here is a marked shift in emphasis from reason to feeling, from calculation to intuition, from objective nature to subjective emotion." [14] Romanticism includes the intangible desires of the mind, revealing intuition and imagination. "This desire, this insistence, this urgency which will not be denied; this uncomfortable hunger...this yearning, ever unsatisfied, is not of the body alone but of the soul...it is the dominant characteristic of man's eminence in nature[.]" [15] Figure 4.1 shows a graphic representation of romanticism.

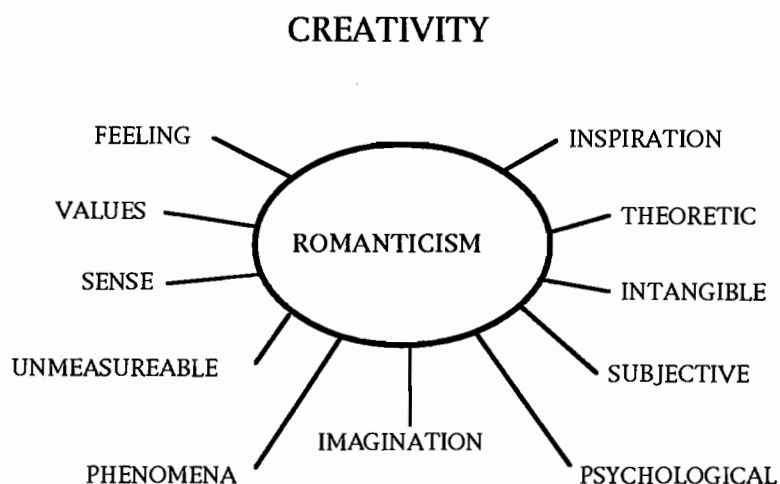


Figure 4.1. Romanticism and Creativity.

4.1 Directive Knowledge

There are many diverse forms of knowledge that can be observed in architectural design. "An architectural design is always influenced by the architect's approach or position, and by additional information from external sources, which completes and modifies the approach." [16] An architect's knowledge may be viewed as : Workshop-Knowledge and Directive Knowledge. [16] Directive Knowledge is listed under the Romantic Intangible Preparation because it categorically fits the impassioned based influence of romanticism.

Directive Knowledge reflects the architect's ability to disperse architectural based theories to provide reasoned interpretations for questions relevant to "why?" in the process of design. In addition, Directive Knowledge offers explanations to value laden judgments relevant to "what-for?". [16]

4.2 Subconscious Reasoning

Reasoning by the subconscious mind allows the process of idea generation, decision and design to progress without the conscious effort to produce results. The subconscious mind continues to with subjective reasoning in effort to provide solidified order to data input from the conscious mind. The subconscious mind is a significant resource to the architectural design process. The conscious (objective) mind supplies complex architectural data to the subconscious mind, and the subconscious mind is able to update input against existing data and reevaluate the content with no disruption to the architect's conscious efforts.

[17]

4.3 Subjectivity and Phenomenology

The approach to design thinking that represents the more contemporary understanding of subjectivity or speculation in design decision making is that of the phenomenologist point of view. Phenomenology focuses on the individual's immediate experiences and his or her own perception of those experiences. Phenomenology is said to be "Radically Empirical" emphasizing that phenomenologist extend the sensory perception base beyond the five recognized senses to include kinesthetic sense and or extra-sensory perception [18]. The nature of phenomenologist is in feeling comfort within the realm of subjective decisions. The phenomenologists search for meaning and understanding rather than explanation. There is a holistic approach to the work of phenomenologists requiring that understanding be obtained from viewing the integrated systems as a whole rather than independent parts. As solutions to problems phenomenologists take up positions and do not propose hypotheses [18]. There is a great deal more to the particular emphasis that phenomenologists express in the process of problem solving, but for the purposes of this paper's objective it is sufficient to state that phenomenologists come to understanding and problem solutions based on subjective criteria as a basis to their processes.

4.4 Preparation

The tendency for being a romanticist or a phenomenologists is in awareness that stems from desire to sense, feel and express without boundaries or limitations. The essence of the phenomenologist's mind lies in understanding the physical nature of things from listening to the Great Spirit within [15]. "It absolutely must be the determination and capacity of the artist that his work shall be as real and convincing as is his own life: as suggestive as his own eyesight makes all things to him; and yet as unreal, as fugitive, as inscrutable, as subjective, as the why and wherefore of the simplest flower that blows. Unless, therefore, subjectivity permeate an art work that work cannot aspire to greatness..." [15]

4.5 The Unmeasurable

In the gestation of all that comprises the enigma of the architect's sense and feeling, Louis Kahn concludes that feeling, sense, like dreams have no measure, no language, they are singular and they are "unmeasurable". [8, 19, 20]

5.0 Scientific Tangible Preparation

Science is a way of exploring and investigating the world and its phenomena by extracting fact, truth and tangible data about the system operations by way of theoretical or empirical processes. Science is tangible because it is a 'describe-explain' strategy [21] that concludes with a "true" proposal about the nature of an experimental system. Theoretical discovery involves the symbolic conceptualization in effort to describe and validates against the laws of nature. Empirical discovery involves an evaluation and experimental process based on observation of the system. Science is essentially tangible due to its ability to be quantitative. When scientific processing concludes, provisional theories have been derived and or objective facts are proposed. Figure 5.1 shows a graphic representation of classicism.

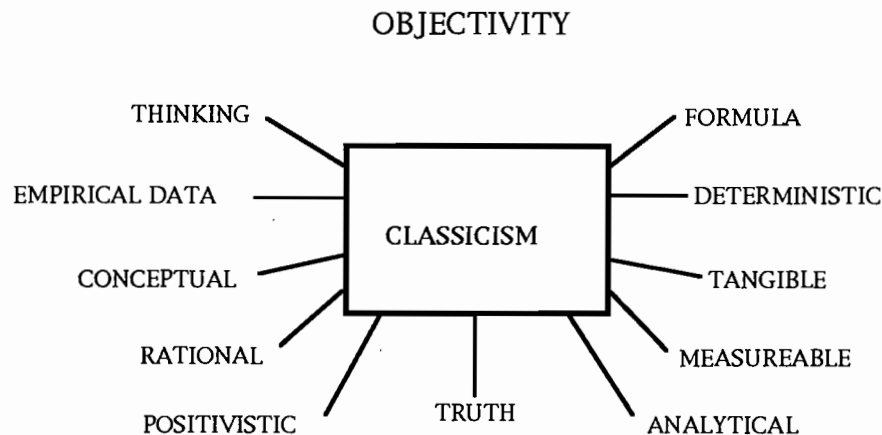


Figure 5.1. Classicism and Objectivity.

5.1 Workshop-Knowledge

As stated above, Workshop-Knowledge is one division of the architect's knowledge base. Workshop-Knowledge represents the conventions and applied methods based on scientific validity. Workshop-Knowledge is objective and requires no further justification. Two sub-strata of Workshop-Knowledge is "Technical Knowledge" and "Architectural Canons". Technical Knowledge provides answers to questions "what?", "how much?", "by what means?", "in Which way?", etc. Technical Knowledge as the name suggest deals with information regarding the technical makeup of architecture and research in new technology. Architectural Canons are

principles characterizing classical laws or proven applications and practices. The use of Workshop-Knowledge enables the architect to provide answers and direction from an objective or scientific perspective. [16]

5.2 Conscious Reasoning

Conscious reasoning is the thinking process that is conducted within the awareness of the wakened mind state. It is the rationalizing process that occurs in an objective mode of the mind and is master to the subconscious mind. The conscious mind searches for facts on which to build its reasoning, and in that vein seeks to propose constructive directives. The subconscious mind as mentioned above as well as the conscious mind work in unison to unravel the questions and answers that occur in the complex design process. [17]

5.3 Existentialism and Positivistic Relevance

Positivism is a philosophy of reasoning based solely on the observable, scientific facts and their relations to each other. Positivists reject speculation, conjecture and subjectivity and are in search of the undeniable truths that exist. Positivists are "standardly empirical" [18], relying on the traditional five senses of human perception. Their emphasis is on predefinition of theories and concepts. They are reductionist deferring to the understanding of the parts of a system as the manner for describing the system. They seek to explain and in so doing make the explanation repeatable and publicly verifiable. [18] Positivists are equatable to existentialists in that they hold to beliefs or doctrine that the concrete, individual existence takes precedence over abstractions about reality. Conceptual essence about the dynamics of human interaction with reality in the minds of existentialists does not take place and only actuality describes the human interaction with reality.

It is easy to see that positivists follow classical understanding about reality and therefore, provide a succinctness about the condition of reality or in this case system processes. The relevance of positivists' perceptions of reality as applied to system operations and processes is that they support the other half of the dichotomy that shall exist in architectural design process. The emergence of a new paradigm for design will balance and unify the dichotomy and equivocate the present duality in effort to offer architectural design that defines the meaning of 'Architecture'.

5.4 Preparation

The essence of the scientific, and the positivists is with regard for the unadulterated absolutes in reality perception. The prepared mind under these characterizations is objective and seeks quantitative results that cannot be disputed. Tangibility of the outcome results is the bi-product of their endeavors. If preparing to express the philosophical essence of this mind set, one would focus on explanation of

things that is not distorted by personal opinion or emotionally influenced. Preparation toward positivism is based in philosophical pragmatism.

5.5 The Measureable

In placing the same conciseness that is born of scientific tangibility, Louis Kahn proposed the measurable. In speaking of the positivists perception of reality Kahn points out, "...[Y]ou are like physical nature itself because in physical nature everything is measurable, even that which is yet unmeasured...". [8]

6.0 Formalizing Integrative Reasoning

The information established conveys an indelible vision of the functional purpose of this investigation as a whole but conveys description of the independent components that will formalize the new paradigm for architectural design. The purpose of this method, is to illustrate even within the design process of this construct, usage of the paradigm process. The purpose of this paper is to propose a descriptive model that may enhance the outcome of design in reaching more prescriptively toward the meaning of 'Architecture'. An actual prescription for design will never be possible because the nature of the problem (architectural design) is complex and is of itself a personal experience that evolves in large part from the conditional and contextual elements of the problem. Notwithstanding this, the emergence of a new design paradigm for architecture will provide a path toward more unified and collective reasoning.

6.1 Complimentary Ingredients

The primary ingredients to this new reasoning is the union of two complementary opposites, intuition and thought. The integration of these two elements previously diametrically opposed come together to bridge dichotomy and build a symbiotic relationship. The new word defining a previously undefined relationship in nature is "Dinergy" [9]. Dinergy is derived from the word Synergy may be a word thought to describe this relation but synergy indicating the joining and cooperation, does not necessarily refer to opposites. The Greek word: dia-"across, through, opposite;" and the word "energy" are combined in a more fitting comprehension of the new relationship. [9] The understanding of nature, its order, its proportion and patterns manifest the integration of opposite in a harmonious balance that brings forth the beauty innate and latent in plants, anatomy, mathematics, etc. [9, 22] "Beauty is a conspicuous element in the abstract completeness aimed at in the higher mathematics; it is the goal of physics as it seeks to construe the order of the universe; it ought at least to be the inspiration of all study of life...It raises for us the question of depth and reach of our awareness." [22]

6.2 Rationalizing Chaos

Time and energy are variables that set order apart from chaos. Time is the inescapable continuum in which the construction and destruction of things occurs. The irreversible flow of time is the fundamental basis for rationalizing chaos in systems. Time must proceed order (the rationalizing of chaos). In viewing the process of design over time the process begins to receive its functional validity. Time is the constant underlying the procession of intuition and thought and so, links the process of design in a sequence of order (at time zero) to chaos to order.

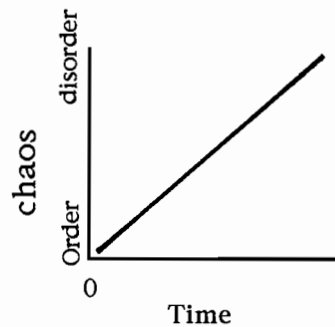


Figure 6.1. Chaos and Time.

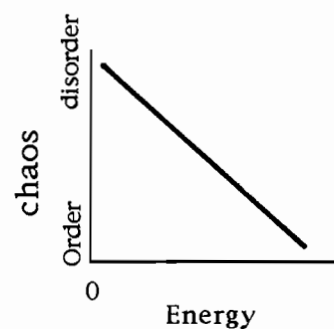


Figure 6.2. Chaos and Energy.

The process of rationalizing chaos in the architectural design process can be viewed with regard for the whole system or as a subsystem or component part of the whole.

6.3 Process

The initial step in rationalizing chaos is to establish any and all variables that may correlate with ones creative instincts. The conceiving of variables stems from the feeling and sense awareness in the designers cognitive formalization. A way of thinking of this, is to throw as many variables as possible upon the "evaluation table". These variables will undoubtedly have varying impact on the understanding of the problem. some variables will require even greater sub division. Variables will have undefined relationships to one another. Having variables that are somehow consistent with the initiation of the design impetus begins the unfolding process of the chaotic state. However, this stage should not be thought of as the maximum state of disorder. As variables and more variables are conceived the state of confusion and the need for greater rationale will be required to control the process toward order. It is essential to add chaos to the problem in the initial stage of processing order. Figure 6.3 conveys this idea.

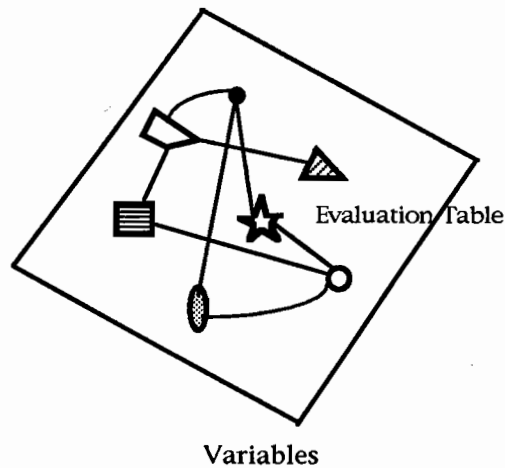


Figure 6.3. Variable Conception.

7.0 General Decision Theory

To move from a chaotic state a process must be applied or some type of change from the static condition that maintains chaos and complexity. The chaos must be induced to change. The change may bring heightened chaos or it may stimulate some insight into the hidden order.

7.1 System Review

Decision making is unpredictable because the problem is made up of many elements or variables that do not naturally show the order or relationships between themselves. The initial view of unanswered problems is that there is no immediate or at least no reasonably predictable solution. Unanswered problems are unique and therefore contain variables that are unique. The disorder must be made understandable before an accurate evaluation the variables and a decision can occur.

The beauty of chaos is its phenomena of intrinsic determinism and the idea that the nature of chaos provides for some embedded order. This is reassuring knowledge because if this were not true, then rational decision making would be prohibited and unnecessary. Decisions as well as the outcomes they initiate would be conjecture. In nature, unity is said to exist within diversity. Order out of chaos is our natural striving.

Any problem has some set of variables that contains the significance of the decision. Some problems are very complicated and contain numerous elements, many elements that are not discoverable initially or that remain absent of the final evaluation altogether. The objective is to improve the decision outcome. If variables for consideration are absent the entire process, then the outcome quality will be

reduced. However, it should be remembered that the implementation of a controlled process produces decisions and outcomes that are probabilistically more superior to non rationalized decisions.

The process of problem solving involves acceptance of the problem cognitively. The problem must have roots in ones conscious and proceed to acceptance by the sub and super conscious levels of the mind. When the problem is submitted to the brain for reasoning by the mind, acceptance of the problem occurs and the actualization of a solution begins. Then, a breakdown of variables and variable information can be continually feed as input data to the conscious brain in response to the problem. The subconscious rationalizes this input data in regard to the problem description but is response driven by the objective. The response rationalization processor of input data is the objective: reaching a considered decision to produce a acceptable outcome.

7.2 Deriving Order

Prior to the semblance of any meaningful order, a systematic transition must be imposed whereby, the elements or variables of the problem are filtered to establish relation among variables. It is possible that by tossing around the selected group of variables, that a pattern of grouping will occur naturally. The grouping could be evaluated to determine the reason elements group or do not group. A relationship is then born among variables. A filtering or sieve process provides a systematic approach for separating elements by virtue of how they respond to that sieve. Sieving is conducted to obtain identifiable order. It is a cumulative selection process that is a reproduce and regeneration type of method. The sieve test with varying levels of matrix design establishes the generation of groupings in a systematic way.

The sieve matrix design is key to providing a successful cumulative selection process. The matrix design is responsive to the peripheral edge of the objective outcome and the encompassing whole containing the variables. The articulation of the matrices should improve or better respond at each level of the reproduce phase, enhancing the quality of the generation. The final generation of the cumulative selection process should provide the most ordered set generation. When this reductionistic approach is concluded, the set elements can be evaluated as part to the whole. By investigating the constituent parts of the established set, the objective outcome and the encompassing whole can be evaluated in reverse to better define the peripheral edge of interaction. Figure 6.4 is an abstract representation of the sieving process.

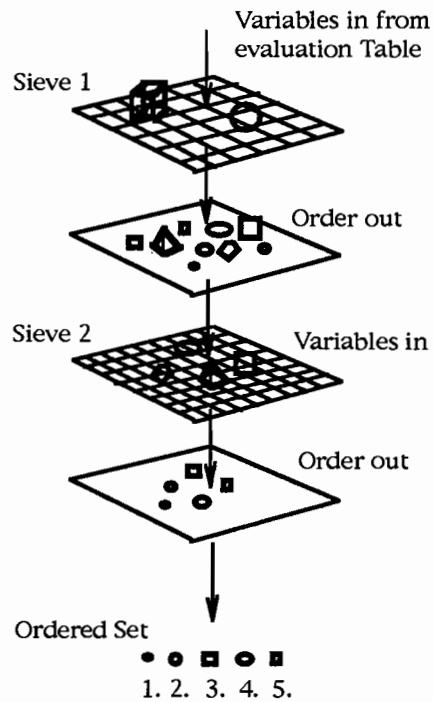


Figure 6.4. Variable Sieve.

7.3 Variable Characteristics

The cumulative selection process has now unobstructed the view into the initial chaotic state. A set of ordered elements assembled from the population of problem variables is introduced.

Each element is assigned a set identifier for tracking purposes. Specific evaluation of each element is conducted to define the specific characteristics that make it unique (see figure 6.5). At the same time, characteristics will be uncovered that show similarity between elements. A crucial point has been reached where element characteristics become subsets identifying the interactions between elements in very specific terms. This relationship is illustrated in figure 6.6.






| Identifier | Variable | Characteristic |
|------------|---|---|
| 1. |  | Circular solid, etc. |
| 2. |  | Spherical and rotating, etc. |
| 3. |  | Rectangular hatched, etc. |
| 4. |  | Elliptical donut, etc. |
| 5. |  | Rectangular cube with circular openings, etc. |

Figure 6.5. Variable Characterization.

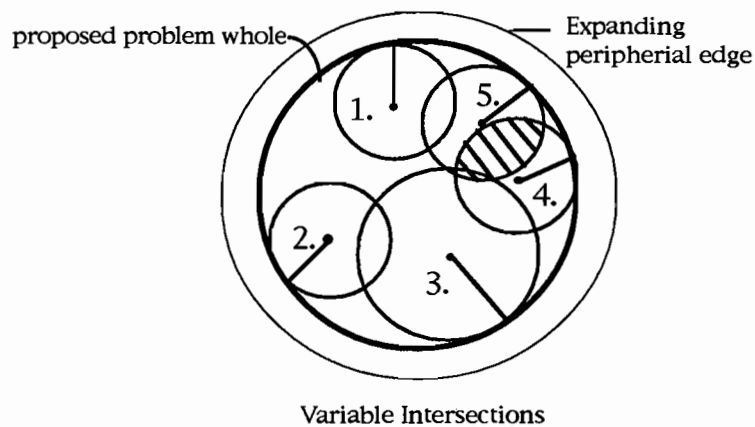


Figure 6.6. Relation of Variables to Whole.

7.4 Processing Architectural Design

When variable intersections can be understood then a realization occurs regarding form. The intersection of characteristics suggest a special exchange between variables. With this relationship, a new form composed of variable intersections emerges. The intrinsic characteristics of each variable defines a greater role in the composition to the whole. these roles when combined evolve the synergistic composition. Form should not be misinterpreted as design. Form comes about without the aid of circumstantial conditioning. Form flows out of the psychological nature of the variable combinations and does not necessarily imply geometry or objective measurability. Form approximates an abstraction of the final geometry and therefore, remains predominately intangible in its physical essence. Form is the fusion of

complimentary elements not unlike that of human conception. When an egg and sperm fuse to initiate growth of a unique life there is certainly great realization of the event. Yet, the identity of that life is far from definition. What is comprehensible is that there remains certain significant ingredients that are necessary to transform this embryo into a more structured fetus. Development of form tends to elicit comprehension of the gaps that will further the composition in its entirety. Form is conception and is representative of transition to the beginning of a formalized chain of events leading to a fully articulated existence of the design. The metamorphic process is harnessed with significant understanding and realization, of self evolution and preservation to "become". Figure 6.7 depicts this process.

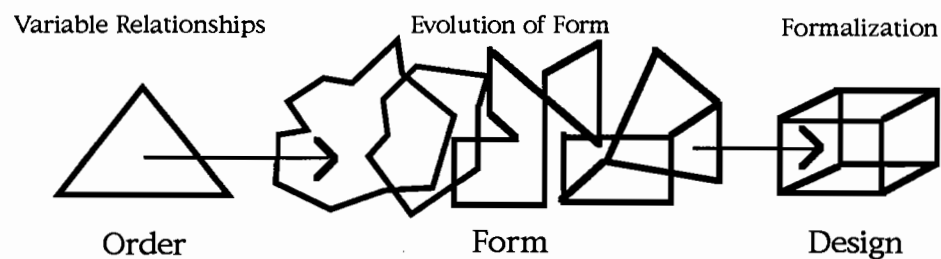


Figure 6.7. Emergence of Design from Form.

7.5 Definition of Architecture

Form most certainly advances the synthesis of design. However, it is from design that architecture rises. Design is the formalization of form. It is said that design belongs to the designer and that the designer is the aid in allowing a thing to be what it wants to be. A thing comes to be out of circumstantial conditions of the project. There is no longer abstraction and intangibility. The fruits of architecture are the growth of individual variables or elements of order as they collide, coalesce and combine in a unity of composition, where the sum of the parts are greater than the whole. The value of architecture comes from the constituent parts being designed and integrated holistically. Each element should be designed from the same base philosophy that originated from the architects instinctive sense of feeling as previously examined.

7.6 Architecture as Defined by Philosophical Process

The composition of architecture is derived from the philosophical process that has been reviewed throughout this writing. The philosophical process that has been defined is an abstraction from the detailed reality and particular vernacular that actually composes architecture. The abstract flow originated from feeling to creativity and objectivity; intuition and thought evolved order leading to understanding; brought about form and realization; permitted design formalization and validated architecture. To this extent, this abstract process is the basis for development of an elaborated paradigm formation that is beyond this writing. The abstract architectural design process proposed here should be considered as the abstracted philosophical design paradigm, illustrated by figure 6.8.

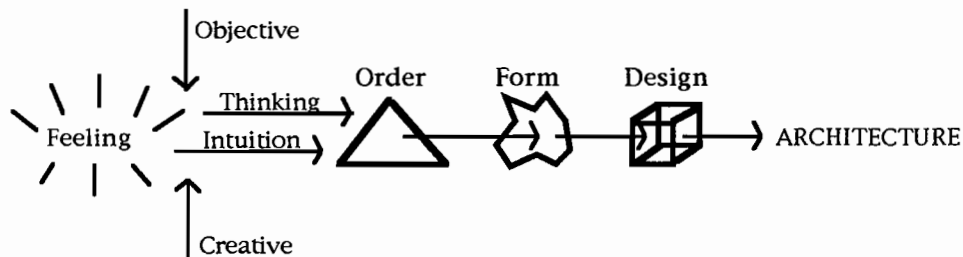


Figure 6.8. Abstract Design Process.

8.0 Parti-Conceptual Representation of Architecture

“The parti is seen as the dominant idea of a building which embodies the salient characteristics of that building. It encapsulates the essential minimum of the design, without which the scheme would not exist, but from which the architecture can be generated”. [23] The parti is important to this study because it is representative of the process from feeling to design. Parti is an architect’s graphical sketch, brief in its line work, but elaborate in its content. The sketch in abstract delineation depicts and expresses all that is to be in the architectural design. The idea, the order, the form and space; the technology, program and context, the perceptual features and the conceptual identities, perfect in a flash of mental assimilation and processing. All tangibility that will emerge from the proposed paradigm and from the actual architectural design process is accomplished with minimum strokes of the pen and an architectural focus is born. Parti is the physical expression of feeling that ignites the beginnings of design process.

8.1 Precedence

The opposite view from parti is that of precedence. Precedence suggest judgment and justification for some action. In this case, precedence is the assigning of evaluation criteria to interpret and qualify architecture against its parti. Precedence is the dissembling of the architecture, its design and elements to determine validity of the parti. In this way, the elements that compose the architectural work are evaluated for their relationship to the composite whole. [23] The process that brought the particular elements of the design together and the specifics of each progression is not described by precedence.

If one can make the leap in understanding between natural and man made; that meaning of an object stems from not just knowing, but, completely understanding the process that evolved the object, then, the following analogy becomes appropriate. If a star or the sun is synomous with a work of architecture, then is it not acceptable to simply sense and perceive its being without deep understanding of its intricacies and the process by which the parts compose the whole? Can it be left alone, experienced, without having been completely understood? It can be left alone, to represent itself in its wholeness. For those who endeavor to learn how a thing comes to be, there is the necessity to extract understanding through process. Architects, students of architecture, scientists, artisans and those who share the need to delve deeper into architectural design process will find that precedence criteria is only the beginning of destructing the design process. By obtaining a comprehensive description of an object, meaning in and of that object is continually enhanced.

9.0 Using the Design Process Model

The design process paradigm described in figure 9.1, is the abstract beginnings of what can be used to progress design along a path of balanced expectation. It is the framework for bringing into focus the essential philosophical ingredients of design and architecture. It serves to convey the conscious and preconscious levels of mental processing that unites design diversities in a progression of awareness about the emerging design. The paradigm is a template for cognitive information processing that guides the architect toward qualitative results. The integrative approach to maturing the unknown to something tangible and experiential in the reality of our existence is a communicative tool for training and teaching about architectural design process. By reaching to understand design from a process perspective, the comprehension of the final product is enhanced and that new knowledge of the final product can be evaluated and measured for consistency. As data is obtained to build a specific precedence for evaluation, the qualitative and the quantitative features in their composition of the whole can be considered, and the paradigm can modified to generate specific traits of architectural potential.

The control parameters, creativity, objectivity, intuition, thought, order, form and design are divisional partitions that separate distinct intervals in the design

rationale. These parameters, though abstract, present the flow from preconscious levels of product expectation and interpretation through conscious manifestation of the real product. Whether the process is verbalized or charted, etc. this is the substance that formulates parti and consecrates the revered architect's work.

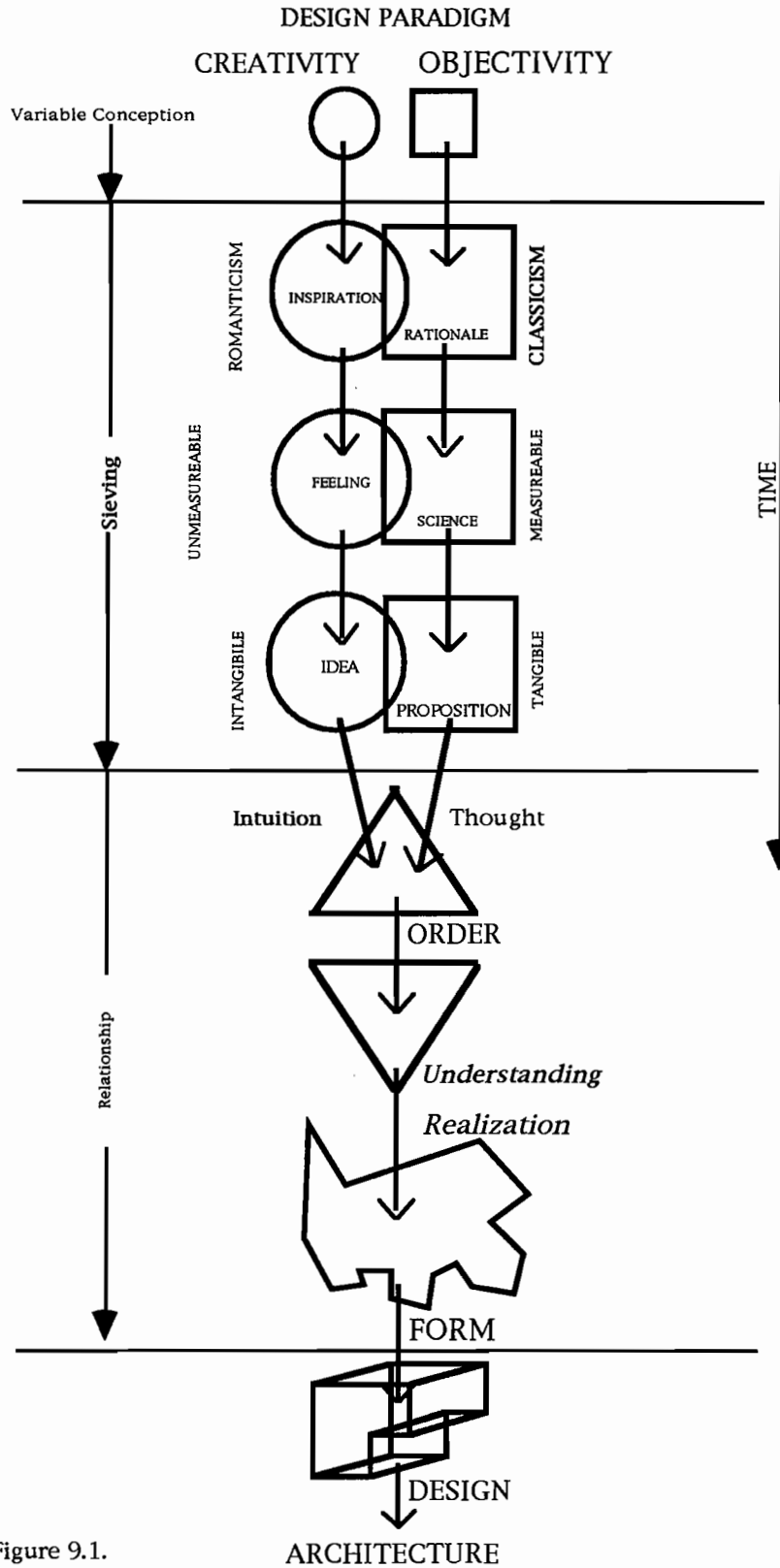


Figure 9.1.

9.1 Architectural Example

To understand an object, one must endeavor to understand its parts, the individual characteristics of those parts, the interaction and relationship amongst those parts. When the basic understanding is reached, then can the object be reassembled. When the object is understood very well, it can be put back together with higher purpose, with affection for its operation and care for its quality. Modifications can then be made to bring about exceptional transformations unconsidered prior to reaching this attainment level. To teach and guide others to construct the object, a process is generated. From this process, comes the culmination of many quality objects that raises the meaning and perception of all similar objects.

If an object can be taken apart, and comprehended from the inside out, then by process, destruction has served to ascertain content and meaning. The taking apart is rather easy as compared to the putting together. But each serve to build a holistic view of the object. Now, suppose a complicated object lie disassembled before you, and your only knowledge is what the finished object should be. The task of assembling the pieces is measurably more difficult than destruction and reassembly. Even worse, imagine that the disassembled parts have among them additional pieces whose individual collectively will not offer a secondary object but serve only to obscure order and understanding. The task of building the object will slow, the frustration is cumulative and quality is lost to focus on meeting the goals and objectives. Consider that you were to design your own parts of the object, given a fixed amount of money, within a given time constraint, and you were expected to meet all owner demands, objectives and personal satisfaction. The responsibility and obligations become expansive, and survival is paramount to all else. This synonymous with the reality of the architect designing architecture. In this type of dynamic, the aid of a paradigm guides progress from inception onward. The design paradigm bridges gaps, unites essential parameters and offers continuity. By following a plan or by recognizing how process flows and evolves, there is a greater opportunity for efficiency, and quality in outcome.

10.0 Conclusion

The design paradigm offered here is the humble beginnings from which a sophisticated and all encompassing model may be developed. There is much more investigation necessary to broaden the paradigm, in effort to offer more dynamic interactions in the process of design parameters. The paradigm that has evolved from this writing is simplistic, abstract and philosophical. It brings to mind the significant awareness that to extract the breadth of meaning in something, to speak of something in regard to its value and contribution, this thing, the architecture, must be understood in its complexity of relationships and interactions. The essential essence of architecture is in experiencing the environmental reality it defines, but to know architecture requires understanding the synthesis.

The balance in nature among all things harnesses the same unity that is attempted to be instilled in the design paradigm and the parameters of the paradigm. If to look at nature one can see that the beauty in nature occurs from merging complimentary opposites, then, if that were all that was brought to the paradigm as being significant, then the paradigm will have been successful in its very simple form.

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