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Architecture as A Physical, Psychological, and Spiritual Science, A Case Study on Indo-Aryan Architecture

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ABSTRACT

Primitive dwellings and traditional houses were commonly built by the local craftsmen or by the dwellers themselves, both under the supervision of a spiritual figure called the spirit man who was present to give guidance on a spiritual level and lead the performance of ritual ceremonies connected with the construction. With the development of social communities and the advancement of knowledge, the architect gradually became the only person in charge of the whole process of designing; who was a professional in a wide range of sciences including mathematics and geometry, history, philosophy, physics, astrology, human inner system, and medicine. These sciences were necessary to equip the architect with proper knowledge in dealing with different aspects of human living as physical, psychological, and spiritual, occurring in every piece of architecture. Therefore, the building designed in this way was able to provide different needs of each household. However, as science advanced and material views became popular, holistic views towards architecture were abandoned, and replaced with specialized sciences dealing with the physical aspect of living, in the 20th century, and the architectural education architect became confined to merely visual arts and physical comfort. Although many scholars such as Christopher Oliver, Christopher Day, and Cooper Marcus, tried to emphasize the importance of psychological aspects of the human system, using traditional buildings as successful examples of architecture, the spiritual side of architecture remained unrevealed. The sciences of geomancy, human spiritual anatomy, and astrology used to be important elements of design in traditional societies, that lead to the creation of sciences such as Feng Shui or Vastru Shastra. This article, studying the art and architecture of Indo-Aryan societies, aims to introduce architecture as a combination of physical, psychological, and spiritual sciences to help create buildings that not only provide physical comfort but also promote health.

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1. INTRODUCTION

In the '1994 DOORS 2 Conference' in Amsterdam Christopher Alexander stated that the biggest problem of architecture in the 2nd half of the 20th century was the high dependence and connection of the inhabitants to the physical world while missing the emotional sense and the sense of possession or belonging to their places and dwellings. Therefore, houses are built only on the physical level disregarding the emotional aspects of living. Since the architects of the modern era are not equipped with the theoretical sciences of the past suggested by philosophers, he introduces a kind of client-based architecture in which the dwellers have a close impact on the design process making the construction evolve organically until the last step which used to be a part of the primitive architecture. (Alexander, 1995) The problem of architecture today, is not only the ignorance of emotional factors but also the lack of knowledge about the psychological and spiritual levels of human living as well.

Regardless of the structural and technological advances and the impact of modern theories in the fields of superficial lighting, air-conditioning, materials, and other mechanical facilities leading to human physical comfort, contemporary architecture has been subject to a wide range of criticism and debates recently for being harmful to human health. The disregarding of cultural values and traditional beliefs which were significant aspects of architecture until the end of the pre-industrial era, through the teachings of the international style and standardization of architectural design, has widely destructed the face of human-built space, especially in developing countries, is another loss of our architecture today. (Salingaros, 2007), (Salingaros, 1995), (Salingaros & Mehaffy, 2006)

Even the failure of the modern prototypes in providing physical shelter due to the extensive use of synthetic materials causing electromagnetic confusion has caused many scholars to return to traditional architecture as a means of creating better spaces that nourish both body and soul. Besides the scholars' ideas, many dwellers also agree with the statement that traditional dwellings evoke better feelings compared to modern prototypes. Thus, although the contemporary system of architectural education is highly dependent on modern theories and technological issues, the traditionally built space is still more favorable among the members of the society. (Day, 2004)

The traditional architecture which consists of primitive vernacular dwellings as well as the pre-industrial built space is regarded as being soul-nourishing, life-giving, and more compatible with human needs by several scholars, whereas the means to recreate such space is not agreed by all. (Alexander, 1979) According to some scholars, the same traditional construction along with its unique lifestyle has to be recreated for the modern man which ignores the technological achievements of today, however, we believe that the architectural knowledge of the traditional era, especially their understanding of the laws of nature and its analogy to the human body, should be adapted with the technology and lifestyle of modern societies. Among the traditional sciences, leading to a proper architectural design is the knowledge of the human body and the connection of built space to human health which was highly regarded by the traditional societies and is required for the architects of the day. (Day, 2004), (Alexander, 1995), (Salingaros, 1995)

2. MATERIALS AND METHOD

2.1 Stages Of Architectural Development

The history of architecture begins with structures which were served as a shelter in its primary usage and as the first manifestations of social groups. Since in primitive

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societies, knowledge was commonly shared by all the people of the community, primitive houses can be viewed as the sum of the available technical knowledge in the society as well as its cultural values. Furthermore, in primitive cultures houses were generally built by the inhabitants themselves who had a better understanding of their needs under the supervision of a spiritual man who would impel the use of certain forms, symbols, patterns, and rituals during construction. "This explains the close relation between the forms and the culture in which they are embedded, and also the fact that some of these forms persist for very long periods." (Rapoport, 1969, p. 4)

There are two major distinctive approaches to architectural development through history; the chronic evolutionary approach which studies the development of built space following time and history and as a reaction to environmental issues, and the cultural approach which accounts for religion and beliefs before the environment.

A. The Chronic Evolutionary Approach

Although some scholars believe that the forms and the geometric patterns used by primitive people in constructing their houses have symbolic and metaphysical significance, others who follow a chronic approach to the history of architecture, suggest that the primitive dwellings were simply inspired by forms and patterns of nature. Therefore, the surrounding environment and the available materials might have imposed certain shapes and patterns in the construction of the dwellings. Since the evidence from the archeological excavations proves that the first dwellings built between 9000 B.C. and 7000 B.C. were semi-circular similar to the shape of the caves and were used temporarily by the occupants who still used to be partially cave dwellers, the evolutionary approach towards the architectural construction may seem appropriate. (Gardiner, 1975) Following the evolutionary stages of human settlement, Norbert Schoenauer believes that the 6th stage of the socioeconomic development categorization is the rise of the permanent settlements which later became the foundation of the urban life. The socioeconomic studies of the pre-urban dwellings reveal that dwellings with circular format are primordial in comparison to rectangular-shaped shelters which might further prove the idea of nature as the inspiration behind the creation of primitive structures. (Schoenauer, 2000) However, after the transition of the circular dwellings into rectangular-shaped houses, a transition should have occurred in the forms and patterns of dwelling construction which draws more attention to the interpretations of the world of nature by the human mind while giving rise to the concepts of mandala and sacred geometry. Therefore, following the evolutionary theory in this era, nature was still considered important through the observation and interpretation of its rules and principles and their application in architecture.

The advent of rectangular-shaped dwellings marks a significant stage in the evolution of man-made structures revealing a structural consciousness and designing methods accompanied by a wider understanding of the dwelling components and spatial composition. The knowledge of scaling, geometry, materials, and construction was achieved through previous experiences which differentiated the role of the inhabitants from the builder and the master builder who was supposed to replace the role of the spirit man. Symbolism and color in this stage were commonly used to denote the values of the previous generations and as a continuance to the prior findings. (Gardiner, 1975) Traditional master builders who in the modern era are called architects are ordered to design dwellings based on specific rules and principles derived from the natural structures and the universal order as well as the cultural values and environmental issues by the society through "the collaboration of many people over many generations as well as the

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collaboration between makers and users of buildings and other artifacts, which is what is meant by the term traditional." (Rapoport, 1969, p. 6) Therefore the patterns used to be in practice as long as the tradition was considered a vital aspect of the social life; which is not significant to the modern man of today.

Followers of the chronic approach mostly suggest a set of characteristics to the ancient houses which simply have changed in time through the collaborations of different civilizations that have led the primitive man to improve his dwellings by gaining knowledge from other nations and adopting it to his culture. (Gardiner, 1975) The third stage in this hierarchy of evolution is the advent of technical knowledge and complexity in terms of architecture which had a great impact on the face of the built space in comparison to the previous achievements. Tradition as the regulating factor was disregarded by the architects and new theories in the field of architecture and housing were incorporated into the new technological advances introduced by the scholars. The complexity of architectural structures and housing projects needed a group of architects and specialists rather than local craftsmen and master builders for the construction process. However, rational, mechanistic, and economical approaches to housing besides the standardization of spaces in the modern stage have ended in the negligence of cultural values and individual preferences to the extent that some scholars think that traditional dwellings were more compatible with human nature. (Salingaros & Mehaffy, 2006)

B. The Cultural Approach

Besides such a chronic approach, which denotes the physical solutions through time to deal with the proper construction of a shelter, Rapoport suggests a historical approach to culture and its dominant factor as the essential force in determining the forms and shapes of the buildings. Thus, he believes that the environment is not the most inspiring factor in dwelling architecture since ancient dwellings were not built in their most efficient configuration but rather based on the symbolic values and the belief system of every culture. Among all the research done on the history of architecture which suggests one force as the dominant factor in determining the format of dwellings through time including climate and the need for a shelter, material and technology, site, defense, economics, and religion, he believes the equilibrium of all forces determine the configuration of dwellings in which religion and belief play a more significant role. (Rapoport, 1969) Redfield also stresses the importance of moral order in comparison to technical one in the study of traditional architecture, questioning the materialistic approaches of Gordon Childe and scholars of the kind. Max Sorre also signifies the importance of cultural, spiritual, material, and social aspects by using the French word 'genre de vie' to signify the sum of all forces. He believes that dwellings are the physical manifestations of the 'genre de vie' which denotes their symbolic essence. Thus, above all, the traditional dwelling would be a symbolic impression of the cosmos which emphasizes the spiritual aspect of the human being distinguishing him from other animals. (Redfield, 1953), (Rapoport, 1969)

The reason behind this cosmology might be the struggle of the imperfect man to create perfect things to help him progress. According to Carl G. Jung, symbols are the creations of man to give meaning to things to stand beyond the limitations of logic and intellect which has made the traditional dwellings distinctive from the modern functional prototypes. (Gardiner, 1975) In Schoenauer's view, such change in the symbolic essence of dwellings from the ancient times occurred after the collapse of the Roman Empire through which the traditional inward-looking dwellings were replaced by the outward-looking houses of the new era following the industrial revolution in which profound changes took

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place in the housing craft; houses divided along socioeconomic lines while polarized with single-family low-density housing and multifamily high-density apartments at two extremes, where the physical efficiency was served as the most important factor. (Schoenauer, 2000)

Both approaches to the history of architectural spaces suggest three substantial stages in the evolution of dwelling construction from ancient times till the present day. Therefore, our current architecture is the consequence of a double change in the essence of the built environment from primitive dwellings to preindustrial vernacular architecture which refers to the traditional dwellings and as the last stage the high-style and modern construction which is commonly built by a group of designers and specialists. Although tradition was the most important factor in determining the principles of dwelling construction in the first two stages, originality plays a more significant role in the modern era. The reason for such a fundamental change from traditionalism to modernism can be the loss of a universal shared belief system and values by the people of the society while putting more emphasis on freedom and originality which is in complete contrast with the concept of tradition as a regulator. (Rapoport, 1969)

2.2 The Role of the Architect in the Development of Built Space

Following the stages of architectural development through history, the role of the architect can be studied in three levels; primitive dwelling architecture, preindustrial, and modern or contemporary architectural design.

Since it is believed that the built space has a direct influence on the life and even character of the occupants, the knowledge of the architect as the creator of such space seems crucial in determining the way people live in the context of society. Therefore, Winston Churchill believes that "first we shape our buildings and afterward our buildings shape us," through a dynamic relationship, subtle and complex more than our predictions, the role of our dwelling areas would be significant in shaping our lives. In this case, spatial structure is not only an arena in which social life occurs but a medium through which social relations are produced and reproduced. (Pearson & Richards, 2004, p. 2)

A. Primitive Architectural Design

The primitive dwellings were constructed by craftsmen or by the dwellers under the guidance of a spirit man who used to direct the designing process following a set of rules and rituals during the construction. (Rapoport, 1969) In primitive societies, the knowledge of supernatural powers or sacred geometries and ritual acts was considered superior to the technical science of construction since it was not shared by all members and could only be applied by a specific group that was aware of spiritual aspects of life and the universe. The belief in supernatural powers or the analogy between the human body and the universe was the core concept behind mandalas, symbols, and the sacred patterns of design introduced as a set of rules and systems of beliefs in various cultures. (Oliver, 1997) The idea proves the theory of Momford who believed that the human was a symbol maker animal before his technological discoveries and industrial life which is the reason for the existence of various cultures around the world. (Miller, 2002)

The role of the spirit man in primitive times was significant in the creation of symbols and geometrical patterns which were later gathered by scholars and introduced as the rules and systems of beliefs in architecture such as Vastu Shastra and Feng Shui to propose certain principles in designing the dwellings; whereas the knowledge of technical acts and

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constructional methods was the consequence of environmental factors and the evolutionary experience of the whole society. (Oliver, 1997), (Rapoport, 1969) The science of the human body and its different aspects of physical, psychological, and spiritual life which the latter discusses around the subject of the soul, the God, and the transcendental realms might be the reason why primitive dwellings were designed in complete connection to the needs and wants of primitive people. (Kumar, 2005) As a result, in primitive cultures, the high aspect of architecture which deals with the universal orders and principles was regarded before the low aspects or the technological and climatic features through the accompaniment of the spirit man in guiding the whole process of construction. (Rapoport, 1969)

B. Preindustrial Architectural Design

With the development of science and technology and the advent of different professions, knowledge was not shared by the entire society anymore and every individual was responsible for the application of a certain career according to his abilities. Such expansion of societies and the social life between the members leading to the division of knowledge and the introduction of new sciences, made the craftsmen the technical appliers while the role of the spirit man transferred to the master builder or the traditional architect who was supposed to have the great knowledge of many subjects including mathematics, physics, geometry, history, philosophy, art, astrology, medicine and religion as the sciences of heaven. (Morgan, 1960), (Rapoport, 1969)

"The architect should be equipped with knowledge of many branches of study and varied kinds of learning, for it is by his judgment that all work done by other arts is put to test," which is divided into theoretical and practical studies. (Morgan, 1960, p. 25) The knowledge of medicine which has been accounted with other sciences as significant for the traditional architects denotes the importance of architecture in traditional societies and its influences on the health of its inhabitants.

Master builder in traditional societies was known as the people who perceived the universal order and could create dwellings in complete alignment and harmony with the natural laws and sacred symbols, to ascent the minds of the inhabitants in the way that they could perceive the transcendental realms too, and therefore accelerate their evolution through architecture. (Snodgrass, 1985)

In fact, in the Middle Ages, the architectural profession was gained after 3 to 7 years of apprenticeship under the supervision of a master craftsman who was supposed to transfer all the theoretical and practical knowledge of craft including the knowledge of masonry, carpentry, and other constructional methods, and a spiritual figure who was aware of the orders of the universe and its analogy to the human body as well as geometry and mathematics that would help the master builder to create places which transcendent the human soul. Only after being educated in both levels of physical and metaphysical knowledge, the junior apprentice could become a journeyman who could work separately as a worker to gain practical experience; to gain the stage of being a senior master builder who was able to create places that nourish both body and soul, the journeyman had to present a masterpiece which shows his proficiency in the subject. In this era, the building designer was commonly called the master builder and only by the end of this period the term architect became popular in architectural societies. (Moffett, Fazio, & Wodehouse, 2003) Therefore in the career of architectural design, there used to be two important matters: "the thing signified, and that which gives it its significance," referring to the power of imagination and the ability to build. (Morgan, 1960, p. 26) While the imagination signifies

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the natural talent of the master builder in creating the shape of the building in his mental plane, the signified refers to the importance of study without which the built space would not be perfect in all directions. This imagination is however different from the concrete thinking of ordinary people since it is based on knowledge and is abstract in basis which will be discussed in the next section. (Morgan, 1960)

Although the role of the spirit man as the conductor of ritual acts and symbolic geometries and patterns in dwelling construction was replaced by the master builder, the sacred and symbolic spiritual beliefs remained important aspects of design, considering which would lead to the construction of sacred spaces, proper for living. The rituals in this era were mostly home-based and applied by the dwellers themselves and only the wealthy members would celebrate great public rituals. (Olivier, 1987)

C. Contemporary Architectural Design

The Industrial Revolution and the modernist movements of the new era introduced a new horizon in the fields of architecture in which technical knowledge and crafts stood superior to symbolic and cultural beliefs as well as metaphysical concepts. The division of science between the agents involved in the process of house construction decreased the significance of the role of the architects while increasing the number of engineers and technical professionals. The complexity of housing projects and architectural structures demanded a team of operators rather than local craftsmen and master builders in which the design phase was considered only a minuscule stage of the whole construction process. (Salingaros & Mehaffy, 2006)

The advent of new concepts of economy, finance, sustainability, user, and technology in modern architecture and the negligence of humane aspects and their influence on the life and state of the inhabitants led to the abandonment of the role of the architect in dwelling construction compared to traditional societies; the reason might be due to the improper education of the architects and the drastic change in the perspective and values of architectural societies. The 7-15% of architects' fees from the whole construction budget decreased to merely 3-4% by the end of the 20th century and continued to decrease until the day and recently in a project conducted by the Ministry of Defense in England the architect's fee was only 0.3% of the whole budget which equals to one thirties to one fifties of the previous era. (Alexander, 2004)

Such drastic conversion in the grounds of architecture and the significance of the architects' roles needs a prompt revision in the theories of the modern era which contrasts with the primitive and traditional viewpoints. Many scholars now believe that the traditional buildings used to create better living spaces evoke a better feeling compared to modern prototypes since the traditional architect was equipped with both knowledge of body and soul. Therefore, the study of traditional rules and systems of beliefs as the principles of architectural design and their knowledge of human beings in ancient and preindustrial societies may help to re-identify the substantial aspects of design leading to the construction of healthy dwellings for today.

2.3 Architecture and Human Bodies

As stated, the purpose of architecture in traditional societies apart from providing a physical shelter was to create a bounded sacred place out of unbounded profane space with which the individuals were introduced to the society. (Kent, 1993)

The idea of creating a sacred place persuaded the ancient cultures to find ways of making their dwelling places the manifestations of the sacred realm. Since the sacred place

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of the dwellings was distinctive from the profane reality of the outside world, the role of the entrance gate, in this case, was crucial as the threshold between these two realms of sacred and profane. (Eliade & Trask, 1968) Profane was called to everything usual while sacred referred to places with sentimental values for the members of the society.

Based on the theories of Yi Fu Tuan one way of transforming the profane space into a sacred place is through creating an experience in the built environment which could be either physical or psychological that would arouse a sense of belonging. The physical experience may be achieved through the stimulation of the human senses by the architectural space and the use of materials, structures, and spatial organizations while the psychological experience could be gained by the proper use of color, light, and certain geometrical patterns and sacred symbols. Thus, any experience of the built environment will generate a specific human state. Based on the state in which the human is put through the architecture, his health might be promoted or disturbed. In this way, the built space is crucial in determining the physical and psychological conditions of any individual or the whole society which will denote the role of architecture towards human health.

Since esoteric traditional teachings of architecture, regard human beings as not merely the composition of their physical form but rather a manifestation of four distinctive bodies of physical, astral, mental, and causal, the knowledge of such bodies is substantial in understanding the principles of traditional architecture. Therefore, it is believed that the vast knowledge of traditional architects towards the human bodies and their relationship to the architectural forms is the root cause of the superiority of the traditional built space in comparison to the modern prototypes. (Silverman, 2007)

The discoveries of quantum physics and alternative medicine today in introducing the different phases of human bodies and their influences on each other can highlight the importance of having such knowledge in traditional societies. Based on recent findings, the human body is composed of four distinctive subtle planes that are interrelated and are capable of influencing the outer environment as well as being affected by it. (Day, 2004)

The first plane which is known to us is the physical body. The physical body is composed of two levels called the visible physical body and the invisible energy body, the etheric double or the aura. While the visible physical body is the composition of all the physical organs, the aura is made of the subtle form of matter known as ether which controls the physical organs through energy power centers called chakras in Indian terminology. Through the invention of different cameras such as the Kirilian camera and tobiscope, the etheric double can be photographed and studied in scientific societies of today. (Master Choa Kok Sui, 2006), (Powell, 1882)

The next plane is the Astral body which is the sum of all the emotional experiences of a person from the very first childhood until the day. The architectural built space, through its geometries, colors, qualities, and aesthetics may affect the emotional state of the users and at the same time affect their physical plane which is associated with physical health. (Powell, 1927)

The mental plane in this case would be the sum of all the thoughts and mental experiences of humans which is connected to both physical and emotional bodies. Therefore, any thought is accompanied by a feeling in everyday life. Symbols, geometries, and concepts of design in every piece of architecture will have direct influences in the mental body and as a matter of interrelation, in the emotional and physical states of a person. Since the mental issues are superior in comparison to the physical and emotional aspects of architectural design, the role of symbols and geometries was highly substantial for the traditional master builder in constructing any property. (Hodson, 2015)

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The fourth plane of the human system is the causal body which is composed of the subtlest matter and is considered higher than the definition of the personality in psychological terminology. According to esoteric teachings, this body remains in different lifetimes or incarnations of the soul and thus carries the dimension of identity. In comparison to the mental plane, the causal body is the house of abstract concepts and ideas whereas the mental body is the center of concrete thinking. These characters of the causal plane mark it as the spiritual aspect of the human being which was highly considered in primitive times through the guidance of the spirit man. It is believed that when the traditional architect was designing the future architectural masterpiece, he was using the causal plane in his imagination which would be later constructed in the physical world. Therefore, his imagination was considered distinctive from the imagination of an ordinary person who does not have the proper knowledge of creation; and was equal to reality. (Powell, 2010)

According to Rumi, whatever the architect is imagining is completely different from the imagination of a regular person. The architect thinks about the building in its ultimate manner. Its width is unlimited, its height is unlimited and its depth is unlimited. Therefore, the imagination of the architect is not the literal meaning of imagination since it is equal to reality and is far more abstract than its worldly order. (Rumi & Chittick, 1983)

This fact indicates that the architect is imagining an abstract idea related to his causal or divine plane not merely based on the mental capacities and that used to make the architect or the master builder differentiated from the ordinary craftsmen who were responsible for the construction phase.

The seven years of apprenticeship under the supervision of a priest and a master craftsman was there to equip the future architect with the knowledge of all human bodies so that the architectural spaces made by him would be compatible with all his needs which now make us believe that the knowledge of human bodies was known to the preindustrial architects and is needed today to recreate such architectural masterpieces.

3. RESULTS AND DISCUSSION

3.1 Case Study on The Principles of Indo-Aryan Architecture

The art and architecture of Aryans were manifestations of their religion and beliefs and are therefore composed of symbolic ornaments and geometrical interpretations of the universe and its order.

“The ancient architectural system of Sthapatya Veda prescribes detailed principles of construction of homes and cities. One of the main principles of Sthapatya Veda is that cities be laid out on an exact north-south grid, with all houses facing due east. Another is that the buildings be oriented to the east with a slope to the east and any body of water on the east. Most of the cities of the Indus Valley followed these principles exactly.” (Pruthi, 2004, p. 284)

Based on historical records, some directions were considered auspicious as well as some geometrical patterns and symbols believed to bring luck, joy, and prosperity while some certain directions and patterns were inauspicious and believed to bring misfortune and misery. Aryan architectural design is shaped due to certain rules, principles, and patterns that used to be carefully followed by the master builders in constructing any property. Such rules and principles were practiced to align the microcosm or the human dwelling, to the cosmos as its macrocosm through the application of the laws of nature. (Pruthi, 2004) Master builder in fact as the person, who has perceived the universal order, was the creator of the dwellings based on the laws and sacred symbols, to ascent the minds

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of the inhabitants in the way that they could perceive the transcendental realms as well. (Snodgrass, 1985)

"Man seeks to discern order in the universe. Through art, science, and religion he searches for meaningful patterns, for a cohesive order underlying the ever-changing current of forms. The older man seeks and but dimly discerns is seen with absolute clarity by the awakened ones. They perceive the forms of the world in their instantaneous and perfect harmony," and introduce them to the public through architecture. (Snodgrass, 1985, p. 106)

The Aryan architecture is composed of three significant concepts place, time, and act. In creating a proper Place to live in, every architect had to follow specific rules and patterns about 3 main categories:

1. "Plan design" which is symbolic in origin and is designed as a complex mandala,
2. "Structure" that is mostly based on the local environment and available materials, and
3. "Ornamentation" in which the sacred figures, symbols, and scripts were followed in a way that provides a proper shelter and at the same time, assigns a sacred identity to the dwellings.

A. Plan and Concept

The first geometrical pattern applied as the floor plan is usually a mandala from which the rest of the concepts and patterns originated. Thus, every construction has its mandala as a 2D plan which later through the construction process transforms into a 3D volume.

Mandala is an Indo-Aryan term meaning 'a container essence,' which is composed of a set of circles and squares, since a circle in Aryan culture was a symbol of perfection and completeness associated with the sacred realm and square was the symbol of the material world. Thus, in every mandala the physical, material world of the inhabitants is connected to the sacred and transcendental realm of the divine. It also means an assembly, which represents the growth. In this case mandala is a means to perfection through the use of symbolic geometrical patterns, following the orders of the universe to shift the human awareness from the profane to the sacred. (Snodgrass, 1985) Therefore mandala is a geometric design to symbolize the universe, used from ancient times, which has even been applied in the ornaments of domes in traditional Iranian architecture. It is believed that the concept of mandalas is even older than history itself, and originated from the sacred hymns "whose sacred sounds contained the genetic patterns of beings and things," which makes the mandala the model of the world. (Goel, 2000)

"The mandala produces enlightenment and, in this sense, gives birth to the enlightened ones." (Snodgrass, 1985, p. 105)

The creation of the mandala starts from a central dot or the Bindu in Indian terminology which signifies the first seed. From the Bindu as a central point or the place of the vertical axis which was believed to be the axis of connecting humans to God, the first circle is created signifying the dynamic consciousness. The outlying square in this case is a symbol of the physical world which was depicted with one gate in each of the four directions. (Goel, 2000) From the mandala, the concept of concentric zones is derived which defines the central point as the residence of the deity while the two outer squares are the residence areas of the human beings. (Kumar, 2005) The model of the central courtyard which was followed in the traditional dwelling prototypes of Iran and India is based on the concept of mandala and its concentric squares. (Figures 1&2)

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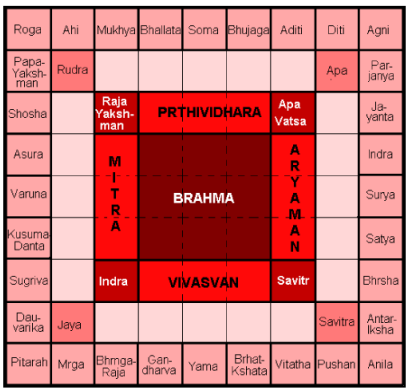

Figure 1. The concept of Concentric Squares in Vastu Purusha Mandala (ssubbanna.sulekha.com)

Figure 2. The concept of Concentric Squares in Abbasi House, Kashan (Fazeli, 2010)

Vastu Purusha mandala is the proper mandala for dwelling construction which not only suggests the directions, units of scale, and geometries of the plan, but also the location of every living area and its accessibilities to other parts of the plan in Vedic texts. Thus, the complete design concept of the plan and its characteristics in Indo-Aryan culture can be identified through the study of the Vastu Purusha mandala. (Silverman, 2007) (Figures 3&4)

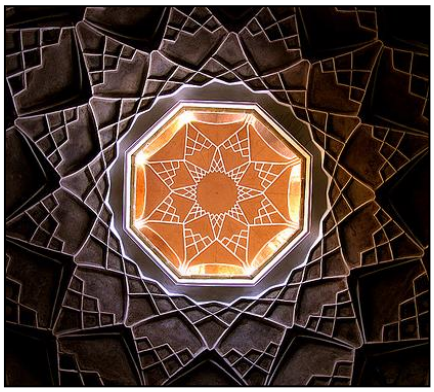

Figure 3. The Vastu Purusha Mandala (schoolofsacredplace.com)

Figure 4. Decorations of the roof of Abbasi House, Kashan representing a mandala (Fazeli, 2010)

The patterns of mandalas applied in the ancient architecture of Aryans of Persia, known as the Parsis in building their sacred architecture, palaces, and dwellings continued to be practiced by the architects even after Islam which is evident in the architectural plans of mosques, gardens and dwellings. The pattern of “four-even” originally was used in the Pasargad palace as a part of the Parsi style of architecture which was later utilized in the plan of the great mosque of Isfahan in Razi style after which the four-given mosques became a common model of traditional Iranian mosque design. The patterns of four gardens, four arches, and a central courtyard which are significant parts of the architecture of the Islamic period of Iran originated from the Parsi style or the Aryan architecture. (Pirnia, 2004)

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B. Structure and Body

Although the structural design in Aryan architecture is highly dependent on the local materials and climatic features of the region, the symbolic beliefs and cosmological values were kept intact - the change in methods of construction and materials has not necessarily ended in the change of the shapes, concepts, and patterns of dwellings, and in fact 'innovation in materials has not affected form.' (Rapoport, 1969, p. 26)

The Indo-Aryan constructions were both plain-roofed using wood as the basic construction material, and dome-shaped. The vaulted roofs were often used to cover the roof of the main halls, hashti, basements, etc. Bedrooms usually had plain roofs. The columns were constructed by pieces of stones while the major used material in the walls was clay. (Pirnia, 2004) The materials used for the construction were mainly wood, stone, and clay, and each type of material based on its quality belonged to a certain social rank. (Bhattacharya, 1974) (Figures 5-8)

Figure 5. The vaulted roof of Swaminarayan Akshardham, New Delhi (flickr.com)

Figure 6. Decorations of the roof of Tabatabayiha House, Kashan, Iran (Fazeli, 2010)

Figure 7. The arch structure of Taj Mahal, India (flickr.com)

Figure 8. The arch structure of Abbasi House, Kashan, Iran (Fazeli, 2010)

The materials and construction methods have always been developed through time from the ancient prototypes, but the rules and principles of dwelling construction were preserved and applied in the same way until the modernist era in Iran which completely neglected the traditional achievements.

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C. Ornamentation and Details

The basic idea behind the wide application of decorations and ornaments in traditional buildings is rooted in the significance of symbolism in ancient cultures. Such symbols were spiritual in origin and mostly derived from natural phenomena, astrological concepts, or mythological stories. (Bhattacharya, 1974)

"In the same way that ordinary language reflects the partial knowledge attained through reason and sense, the language of symbolism expresses the knowledge acquired through the intellect, which is gnosis. Symbols themselves are theophanies of the absolute in the relative. Symbolic forms, which are sensible aspects of the metaphysical reality of things, exist whether or not man is aware of them." (Ardalan & Bakhtiar, 1979, p. 5) In fact, 'man does not create symbols, he is transformed by them.' (Nasr, 2003, p. 61)

Symbols were used to provide the conceptual tools to help the man's mind to journey between the realms of human and the divine which could let him experience the different states of being and evolution. Thus, symbols were the connecting pathways between the human consciousness and the divine, being rooted in religion and spirituality. (Akkach, 2005) The concept of creating symbols was derived from the idea that what exists in higher realms is reflected in that which is lower and therefore the physical world is a reflection of the divine realm. (Ardalan & Bakhtiar, 1979) Rituals, as the manifestations of myth and religious beliefs are connected to the application of decoration and symbolic ornaments as well, since the ornaments were mostly applied in parts of the buildings which were more culturally important. (Bhattacharya, 1974) That is why the main entrance door is always full of decoration while the external walls are commonly left plain in Iranian culture.

Furthermore, the decoration of buildings was determined mostly due to their function which was used to differentiate the house construction from a mosque or a temple, since every symbolic figure or geometrical pattern was believed to generate certain qualities which might be appropriate for one function but not for another. (Oliver, 1997), (Bhattacharya, 1974)

One of the most common symbolic figures used in both house and temple was the swastika in Aryan culture which continued to survive even after Islam. The swastika symbol has been used in the construction of many Iranian mosques as an auspicious symbol. However, the Indo-Aryan mantras like OM or figures of deities which were abandoned by Islamic teachings were replaced by Islamic calligraphy in traditional dwellings of Iran while the mythological scenes and paintings were still used in the interior design of the private houses and public buildings and as patterns on decorative tiles, but not in the decoration of Islamic mosques. (Ayatollahi & Haghshenas, 2003) (Figure 9&10)

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Figure 9. Pattern of Swastika in decorative tiles of Friday Mosque of Yazd, Iran (Fazeli, 2011)

Figure 10. The pattern of Swastika on the entrance gate of a Hindu temple in Delhi, India (flickr.com)

The patterns of chakras have been also used widely by Aryans in decorating houses and temples. This pattern is usually used in decorating the ceilings. While in Indian tradition it is depicted as a painting on the ceiling, in Iranian culture it has given birth to elaborate decorations of the vaulted roofs which are sometimes structural as well. (Figures 11&12)

Figure 11. Pattern of Chakra on the ceiling of Sri Mariamman Hindu Temple, Singapore (worldisround.com)

Figure 12. The ceiling of the main hall in Boroujerdi house, Kashan, symbolizes the throat chakra (Fazeli, 2010)

The Lotus Flower, called “nilūfar-ābi” In the Persian language, is another auspicious symbol widely used by the Aryans in decorations. Lotus is one of the auspicious patterns, usually carried by Hindu gods to remind the devotees of the importance of higher consciousness and God. “Brahma is often shown with four faces which represent the four aspects of human personality, and as seated on a lotus, which is the symbol for the blossoming of higher consciousness from the mud of ignorance.” (Fontana, 2003, p. 37) The Lotus flower is the symbol of higher consciousness. Based on Master Choa Kok Sui’s (2006) studies on Indian Mystics, the lotus flower is the symbol of activated crown chakra which refers to highly spiritually developed people. (Sui M. C., 2006) (Figures 13-16)

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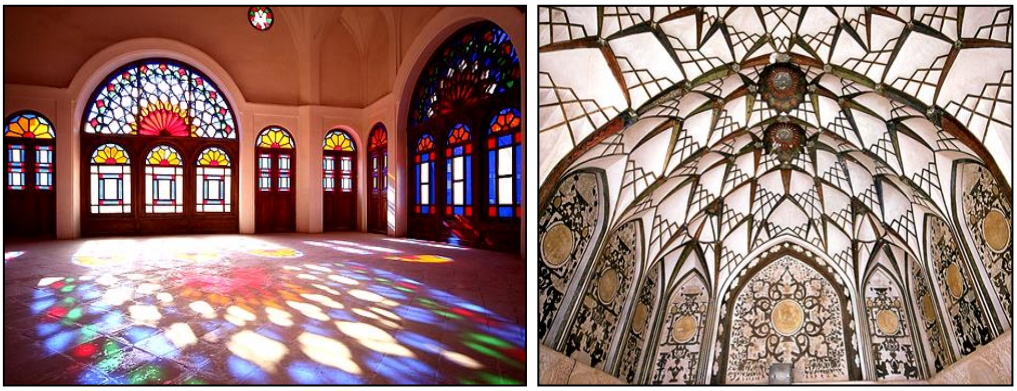
Figure 13. The pattern of lotus flowers on the ceiling of Sri Vadapathira Kaliamman Temple, Singapore (flickr.com)

Figure 14. Symbol of the lotus flower on a Hindu temple (ancient-symbols.com)

Figures 15&16. The symbol of lotus flower in Persepolis, Shiraz, Iran (images.travelpod.com)

By the abandonment of humane figures, geometrical shapes and symbols became important parts of decoration in Islamic architecture of Iran which was mostly achieved through certain arrangements of building materials or the application of decorative tiles or stucco carvings. The proper use of color and light is another significant aspect of Persian architecture which is often used in direct harmony with selected symbols to increase their influence on the users. (Pirnia, 2004) Aryans were aware of the natural and psychological qualities of each color and they commonly used them purposefully. As an example, it is said that the king of Iran, Khosrow Anishirvan used to wear the reddish shade of yellow color clothes while giving private audiences because yellow makes objects look farther away than their true size. That's why once a Mazdaki who wanted to murder the king, failed in his attempt. (Ayatollahi & Haghshenas, 2003)

"In Persian decoration, the most striking qualities are the harmony of blended color, broken up into minute patterns… and the preference of flowing lines and floral ornament to the geometric puzzles of Arabic design." (Hamlin, 1902, p. 146) (Figures 17-20)



Figures 17&18. Details and ornaments of the Tabatabayi House, Kashan, Iran (Fazeli, 2010)

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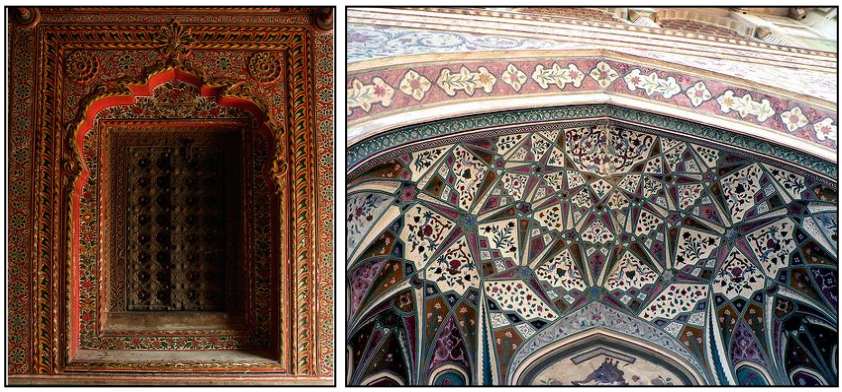

Figure 19. Window niche decorations in Mahansar, Shekhavati region of Rajasthan, India; Shekhavati region is famous for its Indo-Aryan paintings full of mythological themes (flickr.com)

Figure 20. The ceiling of an alcove in the royal apartments in Amber Fort, Jaipur, India (flickr.com)

The Aryan architecture is distinctive due to its simple structure which is often full of surface decorations. (Taus-Bolstad, 2004) In some cases, the decoration is part of the structure itself rather than being a mere façade surface which denotes the significance of decorative elements in the architecture of Aryan civilization. (Pirnia, 2004)

4. CONCLUSION

As evident from the research, the knowledge and skill of proper architecture were significant in traditional societies, which could only be gained through many years of apprenticeship in two distinctive areas of theory and practice. While the theoretical knowledge was taught by a spiritual figure who was aware of the universal order, abstract concepts of creation, and the analogy between the universe, body, and human-built space, the practical knowledge was gained through apprenticeship under the supervision of a master craftsman. Therefore, the journeyman would become a professional master builder who can create places that both nourish the body and soul.

The complexity of modern constructions and the importance of physical and technological advancements given by the modern theories to the architectural work, not only disregarded the spiritual aspects of architectural education but also neglected the significance of previous theoretical issues including mathematics, the knowledge of symbols and geometry, medicine and astrology, giving all the importance to structure and constructional methods. Even aesthetics from its symbolic and transcendental reality was degraded to a set of forms and figures, which followed fashion and individual taste.

Studying examples of Indo-Aryan architecture and their important elements of design, this paper has tried to identify and introduce psychological and spiritual aspects of architecture, that can lead to the creation of buildings that not only provide physical comfort but also transcend the human mind and nourish the soul.

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