

Evaluating the importance and application of natural signs and environmental symbols in contemporary Iranian architecture

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Original Research

Abstract:

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Symbols and signs stand out as prominent indicators in Iranian architecture. The present research aimed to investigate the importance and application of natural motifs and environmental symbols in contemporary Iranian architecture. This mixed methods research was conducted by analytical and correlational methods. Data were collected using library surveys, observation, questionnaire and Delphi panel, and were analyzed by analytic hierarchy process and statistical methods. The results showed that the environmental symbols in the traditional architecture of Iran included three categories: four main states of matter (four elements: earth, air, fire and water), plant motifs and animal motifs; four main states of matter have been of special importance in both pre- and post-Islamic eras. In the post-Islamic era, the importance and role of symbols changed so that plant motifs were widely used more than animal motifs. Among the sub-criteria, the symbol "earth" had the highest weight (0.966), followed by the symbols "water" (0.874) and "air" (0.863). The lowest weight (0.318) belonged to the symbol "camel". In the case study of samples between 1941 and 1981, it was found that four elements and plant motifs were observed in 60% and 30% of the samples, respectively, while animal motifs were not used in any of the studied samples. To conclude, the animal motifs, unlike four elements and plant motifs, have not had an impact on contemporary architecture.

Keywords: Environmental symbols; Four main states of matter; Animal motifs; Plant motifs; Contemporary architecture

1. Introduction

The Art is bound to use symbols and signs due to its inherent brevity and innovation, which is one of its main features. Ever since mankind realized the necessity of communication, the need for the concept of signs, symbols and codes also emerged. What is important behind the use of a sign is to understand the truth and the real meaning of such an expression, which is often not expressed correctly in a form other than a sign and code, and its interpretation will not be possible except in its text. Iranian art and architecture have repeatedly witnessed signs and symbols of the code-like use of objects and shapes (Bemanian et al., 2013). The history of Iranian architecture dates back to the 7th millennium

BC, which is of outstanding importance compared to other countries. Architects used arts such as mosaic work, painting, metal work, plastering and glass art. The art of Iranian architects throughout history and even after the advent of Islam has enjoyed a rare continuity, which expresses the way of thinking, worldview, beliefs, religious beliefs and traditions of the people of this land (Khorsandi Kohanestani and Qarakhani, 2017).

According to the climatic condition and the geographical location of the vast land of Iran, native architects took the path of progress in innovations and, in every age and period, created many masterpieces in creating various cuts, arches, porches, altars, minarets and various decorations in the form of symbols and signs of Iranian architecture (Heydari et al.,

2018). According to the acknowledgment of many prominent architects and artists of the world, Iranian-Islamic architectural style is one of the most inspiring sources that these people have always referred to in order to present their works of art in all corners of the world. The influence of Islamic-Iranian motifs, designs and architecture on Western buildings and mansions has been so great during the past two decades that it has attracted the attention of many experts in this field (Khorsandi Kohanestani and Qarakhani, 2017).

Due to the guidance of humans to spiritual, non-material and metaphysical meanings, the symbols not only can play a role as a common language and a factor of unity in society, but also give precious richness to the arts, literature, customs and social relations of the society. The amount of use of symbols and signs in different places and the extent and diversity of its types are among the things that have always increased the complexity of discovering its meaning and analyzing its real secrets (Behbahani Eslami et al., 2016). This recognition can sometimes be shallow or even wrong. In other words, the lack of deep understanding of physical symbols in architecture and their imitation, regardless of the inner secrets that can be rooted in philosophical, cultural thoughts and certain intellectual currents, is something that can have a destructive effect on the future of the culture and identity of the countries (Baharloo et al., 2019). Common archetypes, with slight modifications and many similarities, are common in different cultures, worldviews and religions, which can be called as universal symbols (Sakizadeh and Jafari Dehkordi, 2017).

Therefore, the purpose of this research was to investigate the role and importance of using natural signs and environmental symbols on contemporary architecture. Basically, the research question was, what was the impact of symbols derived from nature on contemporary Iranian architecture? The symbol is based on the conventions of semiotics. A symbol is a means of converting a mental content into an objective form, such as traffic signs, and wearing black clothes (for Muslims as a sign of mourning). Familiarity with myths and archetypes and their concepts guides the researcher, because the language of symbols is sometimes vague, which requires knowledge of the basics. Various categories have been proposed for symbols, signs and codes, which are sometimes contradictory. Some have considered the symbol to be higher and some have considered the signs to be a matter of development and convention in the opinion of Islamic philosophers. In any case, people like Rudolf Arnheim know that the symbol is higher, which may make the structure of the building stronger and more meaningful in the matter of architecture; He considers the sign to be a contract in affairs, and therefore considers the symbol to be much higher conceptually, which will be discussed in detail later (Torabi and Asadi, 2015).

Most of the Western philosophers consider symbolic language and symbolism to be influential on culture and influenced by culture. The predominant view of these thinkers on symbolism is scientific and unconscious approaches, which are presented in a range of psychological concepts. Most of the philosophers consider the symbol as a factor in the

transformation and writing of the world, which can cause various changes and developments. According to the western philosophy, the symbol is the actions and mentalities of a person, which are formed and give consistency; some even consider all human activities to be symbolic. Rudolf Arnheim considers culture to be one of the influential factors in symbolism and writes: "*The more culture goes beyond the basic necessities, the more obvious the response of architecture to the need for symbolism becomes, and this turns buildings into carriers of broad visual themes*" (Ahmadi, 2014). Lang (2009) in his book "Creating Architectural Theories", explores the nature and purposes of symbols and their aesthetic dimensions. He uses the words "symbol" and "sign" in the same sense and considers it as the result of a cognitive process that, depending on the subject, finds an implicit meaning beyond the instrumental use (Bagheri and Einifar, 2017).

Iranian art originates from the inner feeling of the artist and is combined with culture, religion and spiritual rituals. In Islamic art, in addition to content and appearance, "design" has an inner meaning in which the investigator's eye seeks to find the inner secret of beautiful appearance, a meaning that returns to the inner world. Thus, the language chosen by Islamic art to convey its meaning to its audience is a symbol, just as the whole universe is a symbol of God in Islamic thought. Hence, symbolism is a necessary and obligatory matter in Islamic Art. Symbolic expression in architecture means providing a perceptual context for conveying some specific concepts through architecture as a medium. This media value is doubled when architecture enters the social arena and the building is presented in a more general sense. The first way to crystallize meaning in architecture is paved through the use of signs and symbols (Rezaei, 2012).

Motifs are not only decorative in Islamic art, but also represent meanings and concepts that have chosen art as their language to spread their great teachings through symbols. Plant motifs in Islamic art undoubtedly include one of the most complex and diverse human symbolisms. The world of plants is the place of the emergence of living reality and lives that are renewed every now and then. The most abstract and at the same time the most stylized form of life is that of plants (Shahbazi et al., 2013). It is not without reason that this most spiritual form of life has been present in the holy places of Islam and continues to grow. It can even be accepted that the most important categories of Islamic motifs, such as geometric, Eslimi and life, are of plant origin; A tree or any other plant symbolizes the growth and development of mental life (Tabatabai and Hemmati, 2014). In Islamic art, the plant is a symbol of excellence and growth, and a symbol that has its roots in the soil and its head towards the sky. Architecture uses the language of symbols to express its inner concepts, and every person is able to understand the concepts and themes hidden in different forms of Islamic art by thinking and meditating on different works of art based on his/her intellectual growth and spiritual excellence (Rezaei, 2012).

Semanticism and coded expression are one of the main features of Islamic art and architecture. The symbols and signs in Islamic architecture express the deep and fundamental

religious concepts in Islamic art. The symbolic attitude towards existence and its phenomena has been prominent in Iranian culture and ancient ontology since the distant past (Khaki, 2021). The purpose of symbolization is to remove human boundaries within society and the world and to unite them with the rhythm of nature. The language that Iranian art has chosen to convey its concepts to the audience is the language of symbols (Quchani, 2017).

A symbol is not a subject that can be addressed from only one dimension. In some articles, some consider "sign" to be the first and some consider "symbol" to be the first. Figure 1 shows the segmentation in the context of the symbol.

2. Materials and methods

This mixed methods research (using both qualitative and quantitative research methods) included library and field surveys in the form of interviews, analysis and description. The data were collected by a researcher-made questionnaire and analyzed by SPSS software using descriptive and inferential statistics methods along with the Delphi technique. The research was conducted in the following three general steps.

A) In the first step, the symbols found in Iranian traditional architecture were recognized by using library sources and field observations to investigate the history and meaning of architectural symbols in different periods. In addition, some Iranian architects and architectural experts were interviewed for their opinions and views on symbols and their meanings. The studied time frame included the architecture of ancient Iran (before Islam) and the period of Iranian-Islamic architecture. Content analysis method was used in this phase of studies. The statistical population of the research included architecture professors from various universities in Tehran. Out of 700 eligible people, based on Cochran's method, 248 subjects were selected by simple random sampling method (Equation 1).

$$n = \frac{z^2 pq}{d^2} \left(1 + \frac{1}{N} \left[\frac{z^2 pq}{d^2} - 1 \right] \right) \tag{1}$$

$$n = \frac{\frac{(1.96)^2(0.5)(0.5)}{(0.5)^2}}{1 + \frac{1}{700} \left[\frac{(1.96)^2(0.5)(0.5)}{(0.5)^2} - 1 \right]} = 248$$

B) In the second step, the data collected from semi-structured interviews with architecture professors were analyzed based on the indicators of symbols and contemporary architecture, and their importance and role were compared between the pre- and post-Islamic periods. The data were analyzed by the Delphi technique, and the degree of use of each of the symbols and signs related to natural elements in Iranian architecture was compared by the Analytic Hierarchy Process (AHP). The AHP is a flexible, robust and simple method used to simultaneously assess qualitative and quantitative indicators (Bertolini and Braglia, 2006; Khorsandi et al., 2019). In this method, each index has a specific weight that should be applied by the user (Ahmadi, 2014). To determine the degree of importance (weight) of criteria and sub-criteria, there are several methods, the most common of which is pairwise comparison, so that the criteria are compared in pairs to determine the degree of importance of each criterion compared to the other. Thus, each pairwise comparison is assigned a scale from 1 to 9. The degree of importance of each scale is specified in Table 1. After weighting, the obtained weights should be normalized using different methods; in our model, the division of each weight by the sum of the weights of the same column was used for normalization (Beskese et al., 2015). After prioritizing the indicators, the degree of importance of the options was determined. At this stage, the priority of each dimension was judged in relation to each of the sub-criteria (if the criterion had no sub-criteria, it was judged directly with that dimension itself). The "final score" of each dimension was determined by combining the above-mentioned degree of importance. For this, the "principle of hierarchical combination" was used, which led to the "priority vector" considering all judgments at all hierarchical levels (Ahmadi, 2014). One of the advantages of the AHP method is the possibility of implementing consistency in the judgments made to determine the degree of importance of criteria and sub-criteria. Checking the consistency in the considered judgments is possible by calculating a coefficient called the

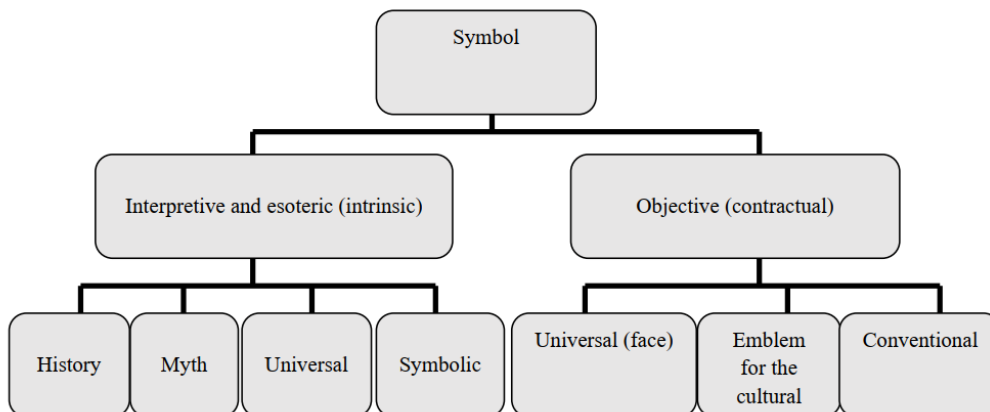


Figure 1. Structural dimensions of the symbol (Torabi and Asadi, 2015)

Table 1. Description of nine scales of Analytic Hierarchy Process (AHP) for pairwise comparison (Beskese et al., 2015).

| Scales | AHP priorities |
|---------|------------------------|
| 1 | Equal Importance |
| 3 | Moderate importance |
| 5 | Strong importance |
| 7 | Very strong importance |
| 9 | Extreme importance |
| 2,4,6,8 | Values in-between |

inconsistency coefficient (IR), which should be less than 0.1. Using this coefficient helps to analyze the decision before making the final choice (Rathore et al., 2016).

C) In the third step, qualitative and quantitative surveys were conducted on 10 architectural landmarks between 1941 and 1981. Statistical calculations such as Kolmogorov-Smirnov test, regression test, Pearson correlation coefficient were used in SPSS22 software.

3. Results

The research findings were presented in two separate sections. In the qualitative section, the findings were categorized by reviewing documents and images, as well as relying on field observations. The concepts shown in Table 2, various topics related to natural resources and the environment in Iranian architecture, have a great diversity and multiplicity of applications. Among environmental symbols, plant motifs have been used more. Regarding animal motifs, birds have been used most of all, which were classified into two groups of real and mythological birds (Simurgh and Phoenix). In addition, the roles of lions and cattle, then goats and horses were observed more than other species. In the quantitative part of the research, pairwise and group comparisons of variables were made using expert opinions and AHP. To this end, the extent of use of each of the natural and environmental symbols in different periods of Iranian architecture was compared with each other. Therefore, expert opinions were used for pairwise comparison of criteria (Tables 3 and 4). The results indicated that "Four main states of matter" was more important in both

pre- and post-Islamic eras. In addition, the animal motifs were more widely used in the architecture of ancient Iran (pre-Islamic architecture) than in the post-Islamic period. In the post-Islamic era, the importance and role of symbols changed in such a way that the plant motifs were more widely used. As seen in Figure 2, the symbol "earth" had the highest weight (0.966), followed by the symbols "water" (0.874) and "air" (0.863). The lowest weight (0.318) belonged to the symbol "camel". In the case study of samples between 1941 and 1981, it was found that four elements and plant motifs were observed in 60% and 30% of the samples, respectively, while animal motifs were not used in any of the studied samples (Figure 3). The results of this part of the research showed that the item of animal motifs was a symbol that was being eliminated in the investigated buildings of this period. In addition, the geometry and use of "water" mostly in the area and "earth" due to the brick materials used in the building were among the concepts of lasting symbols in these buildings.

In the next step, the research questions were analyzed descriptively by the Delphi panel. First, the criteria related to contemporary architecture were examined, and then the criteria related to architectural symbols were examined. Table 6 shows the descriptive statistics related to the sub-criteria of the main criteria of Animal motifs. Table 7 shows the descriptive statistics related to the sub-criteria of the main criteria of Four elements (earth, air, fire and water). The correlation of the research constructs is presented in Table 8. Considering the normality of data distribution, Pearson's correlation test was used to check the correlation between

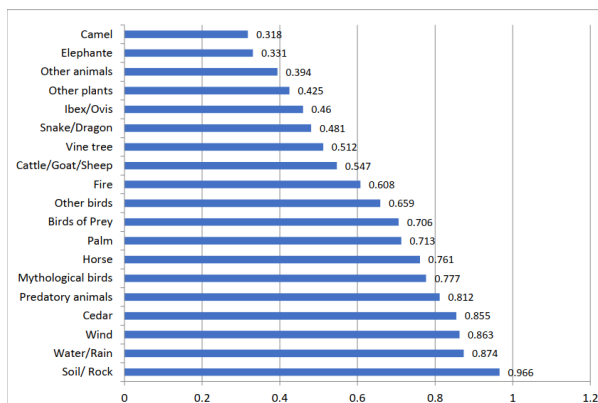
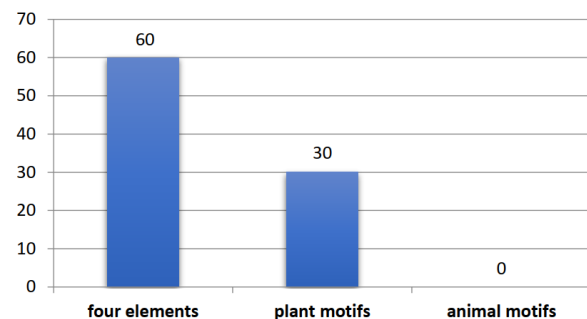











**Figure 2.** The relative weight of symbols based on the importance and extent of their use in the traditional architecture of Iran in the pre- and post-Islamic eras.**Figure 3.** The extent of the use of each environmental symbol in the architecture of selected examples between 1941 and 1981.

Table 2. Various environmental concepts and their equivalent symbols in traditional Iranian architecture (source: research findings).

| Symbols (Main criteria) | Paintings (sub-criteria) | Concepts | Image examples | Sources of images |
|--|-------------------------------|--|--|------------------------------|
| Khatai, Eslimi and Plant motifs | Vine tree | Tree of life, symbol of the universe |  | Susa |
| | Ivy | The role of the eternal force, the sacred aspect, are designed to be rougher, stronger and heavier and are a symbol of masculinity. |  | Jame Mosque of Isfahan |
| | Morning glory | Order, beauty, purity |  | Apadana Staircase |
| | Khatai plant | The reason for its wideness and elegance and various decorations are famous as a symbol of femininity, a delicate Eslimi variety with flowers, bushes and buds to create order and unity among the elements. |  | Jame Mosque of Nain |
| | Cedar | Growth, vitality and stamina |  | Persepolis (Takht-e Jamshid) |
| | Palm tree | Life and durability |  | Susa motifs |
| Animal motifs | Birds | Simurgh (symbol of Gabriel, symbol of spirituality, symbol of mentor and guide) |  | Ganjali Khan Complex |
| | | Peacock (magical life, symbol of the sun, symbol of dignity, symbol of rebirth, symbol of beauty) |  | Hasht Behesht Palace |
| | | Bitterns (seeker/value of water) |  | Taq Kasra |
| | Wild and mythological animals | Falcon (victory and overcoming) |  | Apadana Palace |
| | | Lion, tiger and leopard (courage/bravery/hunting and war) |  | Persepolis (Takht-e Jamshid) |

Continue of Table 2.












| | | | | |
|--|----------------------|--|--|---|
| | | Snake (treasure hunting/healing/devil) |  | Ancient art of the Iranian Plateau |
| | | Dragon (demon, sign of eclipse) |  | Relief in Zanjan mountain and Qajar dynasty architecture |
| | | Camel (endurance/patience) |  | Architecture of the Medes period |
| | | Elephant (luck/power/war) |  | Sasanian architecture |
| | | Ibex/Ovis (food/courage) |  | Taq Kasra |
| | Domesticated animals | Horse (agility/fighting/service) |  | Persepolis (Takht-e Jamshid) |
| | | Cattle (fertility/usefulness) |  | Achaemenian architecture |
| Four main states of matter (four elements) | Water | Cold and damp and symbolically life-giving; it refines life and restores it to its eternal state. |  | Shahzadeh Mahan Historical Garden |
| | Fire | The ability to cause growth, refine, redefine, and create heat and light as the most important aspects of fire in architecture |  | Sheikh Lotfollah Mosque |
| | Earth | Dry, cold, dense, passive, and heavy; its symbol is cube in geometry and cosmic mountain in nature |  | A sample of Safavid tiles, the Victoria and Albert Museum. |
| | Air | Bearing light, which attributes heat and humidity, refining and softening; Ability to rise to matter |  | The oldest windmill in Iran, belonging to the Safavid dynasty |

Table 3. Pairwise comparison matrix of criteria (environmental symbols in traditional Iranian architecture in the pre-Islamic period)

| | Four elements | Plant motifs | Animal motifs |
|---------------|---------------|--------------|---------------|
| Four elements | 1 | 5.1 | 3.1 |
| Plant motifs | 1.5 | 1 | 1.2 |
| Animal motifs | 1.3 | 2.1 | 1 |

Table 4. Pairwise comparison matrix of criteria (environmental symbols in traditional Iranian architecture in the post-Islamic period)

| | Four elements | Plant motifs | Animal motifs |
|---------------|---------------|--------------|---------------|
| Four elements | 1 | 1.4 | 3.1 |
| Plant motifs | 4.1 | 1 | 6.1 |
| Animal motifs | 1.3 | 1.6 | 1 |

Table 5. Introducing the descriptive statistics of the sub-criteria related to the main criterion of Khatai, Eslimi and Plant motifs

| Sub-criteria | Target code | Mean | Standard deviation | Qty |
|--|-------------|--------|--------------------|-----|
| Tree of life | Q51 | 3.2742 | 1.06774 | 248 |
| Symbol of the universe | Q52 | 3.5927 | 0.93841 | 248 |
| The role of the eternal force | Q53 | 3.8790 | 0.82692 | 248 |
| The sacred aspect | Q54 | 3.7056 | 0.89006 | 248 |
| Rougher, stronger and heavier design; a symbol of masculinity | Q55 | 3.4677 | 0.94528 | 248 |
| The reason for the wideness and elegance and various decorations; a symbol of femininity | Q56 | 3.4839 | 0.76046 | 248 |
| A delicate Eslimi variety with flowers, bushes and buds to create order and unity among the elements | Q57 | 3.5766 | 0.88133 | 248 |

Table 6. Introducing the descriptive statistics of the sub-criteria related to the main criterion of Animal motifs

| Sub-criteria | Target code | Mean | Standard deviation | Qty |
|------------------------------|-------------|--------|--------------------|-----|
| A symbol of Gabriel | Q58 | 3.6290 | 0.92178 | 248 |
| A symbol of spirituality | Q59 | 2.7863 | 0.96008 | 248 |
| A symbol of mentor and guide | Q60 | 3.3226 | 0.99837 | 248 |
| Magical life | Q61 | 2.8266 | 1.06384 | 248 |
| A symbol of the sun | Q62 | 3.5121 | 0.85831 | 248 |
| A symbol of dignity | Q63 | 3.5806 | 0.90520 | 248 |
| A symbol of rebirth | Q64 | 3.6048 | 0.86139 | 248 |
| A symbol of beauty | Q65 | 3.7056 | 0.87130 | 248 |

Table 7. Introducing the descriptive statistics of the sub-criteria related to the main criterion of Four elements (earth, air, fire and water)

| Sub-criteria | Target code | Mean | Standard deviation | Qty |
|---|-------------|--------|--------------------|-----|
| Cold and damp | Q66 | 3.9234 | 0.82850 | 248 |
| Symbolically life-giving | Q67 | 4.5323 | 0.67260 | 248 |
| Refinement of life and restoration to the eternal state | Q68 | 2.2105 | 0.74641 | 248 |
| Ability to cause growth, refine and redefine | Q69 | 2.3806 | 0.78146 | 248 |
| Heat and light as the most important aspects of fire in architecture | Q70 | 2.3968 | 0.79918 | 248 |
| Dry, cold and dense | Q71 | 2.2389 | 0.86698 | 248 |
| Passive and heavy | Q72 | 2.5385 | 0.88204 | 248 |
| Its symbol is the cube in geometry and the cosmic mountain in nature | Q73 | 2.4656 | 0.82997 | 248 |
| Bearing light, as attributes of heat and humidity, refining and softening | Q74 | 2.4413 | 0.84319 | 248 |
| Ability to rise to matter | Q75 | 2.2955 | 0.81006 | 248 |

Table 8. Pearson correlation coefficients between research variables

| Variables | Animal motifs | Khatai, Eslimi and Plant motifs | Four elements | Sig. | Status |
|---------------------------------|---------------|---------------------------------|---------------|-------|-----------|
| Geometric shapes | | | | 0.001 | Confirmed |
| Colors | | | | 0.001 | Confirmed |
| Animal motifs | 1 | | | 0.001 | Confirmed |
| Khatai, Eslimi and Plant motifs | 0.41 | 1 | | 0.001 | Confirmed |
| Four elements | 0.34 | 0.50 | 1 | 0.001 | Confirmed |
| Contemporary architecture | 0.12 | 0.12 | 0.78 | 0.001 | Confirmed |

research variables. The results of this test showed a positive correlation between the criteria of the variables. Table 9 shows that the beta value of the constant number of the model was equal to 2.03 and the coefficients of the independent variable of animal motifs on contemporary architecture were equal to 0.12. Considering that the t statistic value for the independent variable was greater than the standard (1.96) and was not significant at a 95% confidence interval (Sig. =0.054), it could be claimed that the animal motifs had no positive and significant impact on contemporary architecture. This hypothesis was not confirmed.

The correlation coefficient was 0.64 between independent and dependent variables and the coefficient of determination (R^2) was 0.41, indicating a satisfactory explanation. This value showed that 0.41% of the changes in the dependent variable were related to the independent variable, but since this value does not consider the degree of freedom, the adjusted coefficient of determination (Adjusted- R^2) was used for this purpose, which was calculated to be 0.41 in this model. It showed that 0.41% of contemporary architecture was predicted by Eslimi, Khatai and plant motifs. On the other hand, Durbin-Watson (DW) statistic was used to check the correlation between residuals. The value of DW statistic was 1.88 (that is, between 1.5 and 2.5), so there was no correlation between errors in this model. Therefore, according to the mentioned criteria, the model had the goodness of fit for the influence of Eslimi, Khatai and plant motifs on contemporary architecture.

According to Table 10, the value of the F statistic (which is significant at an error level of <0.05) showed that the independent variable had an acceptable explanatory power and was able to explain the changes and variance of the dependent variable well, so the F statistic or significance level (Sig.) was used for the significance of the whole regression. The value of Sig. =0 indicated the rejection of H_0

hypothesis versus H_1 hypothesis. Therefore, the regression was significant at $\alpha = 0.05$.

According to Table 11, the correlation coefficient was 0.78 between independent and dependent variables and the R^2 value was 0.61, indicating an excellent explanatory power. This value showed that 0.61% of the changes in the dependent variable were related to the independent variable, but since this value does not consider the degree of freedom, the Adjusted- R^2 was used for this purpose, which was calculated to be 0.60 in this model. It showed that 0.60% of contemporary architecture was predicted by the factors of the four elements. The next output was the Analysis of variance, or ANOVA, test results, which showed the f-values so that the significance of this statistic indicated the goodness of fit of the regression model. According to Table 11, the value of the F statistic (which is significant at an error level of <0.05) showed that the independent variable had an acceptable explanatory power and was able to explain the changes and variance of the dependent variable well, so the F statistic or significance level (Sig.) was used for the significance of the whole regression. The value of Sig.=0 indicated the rejection of H_0 hypothesis versus H_1 hypothesis. Therefore, the regression was significant at $\alpha = 0.05$. In fact, it can be said that the four elements have had a positive effect on the contemporary architecture.

4. Discussion

The art of Iranian architecture throughout history and even after the advent of Islam has enjoyed a rare continuity; this art expresses the way of thinking, worldview, beliefs, religious beliefs and traditions of the people of this land. Iranian architects, under the influence of their native religion and culture, have turned to the use of signs and symbols in the landscape, and in this way, while paying attention to the body of the design; they have strengthened the theme and

Table 9. Coefficients of regression effect

| Variables | Unstandardized | | Standardized Beta | t-value | Sig. |
|----------------|----------------|------------|-------------------|---------|-------|
| | B | Std. Error | | | |
| Constant value | 2.03 | 0.152 | | 13.32 | 0.000 |
| Animal motifs | 0.136 | 0.067 | 0.128 | 2.02 | 0.054 |

Table 10. Coefficients of regression effect

| Variables | Unstandardized | | Standardized Beta | t-value | Sig. |
|---------------------------------|----------------|------------|-------------------|---------|-------|
| | B | Std. Error | | | |
| Constant value | 1.80 | 0.137 | | 13.17 | 0.000 |
| Eslimi, Khatai and plant motifs | 0.497 | 0.038 | 0.64 | 13.14 | 0.000 |

Table 11. Results of ANOVA test

| Models | Sum of squares | Degrees of freedom | Mean square | f-value | Sig. |
|------------|----------------|--------------------|-------------|---------|-------|
| Regression | 32.81 | 2 | 16.40 | 192.251 | 0.000 |
| Residuals | 20.90 | 254 | 0.085 | | |
| Total | 53.72 | 247 | | | |

content of the plans based on cultural and religious themes. According to the climatic condition and the geographical location of the vast land of Iran, native architects took the path of progress in innovations and, in every age and period, created many masterpieces in creating various cuts, arches, porches, altars, minarets and various decorations, and in the meantime mosques have had a high position. Aesthetics, religion and religious beliefs are among the basic factors of identity in architecture, which should be in a way that gives people an expansion of mind and makes them interested in the environment and the city. Culture, family, environment and other related factors have tremendous effects on the perception of beauty. Architecture, as one of the places where opinions and views emerge, especially in relation to religious buildings, has never been separated from symbolism and coded language. On the other hand, the detailed knowledge of architectural works and the process of symbol formation in these works and its influence on local patterns and culture help to know the national identity of the people of the society. Symbolizing the environment and many belongings that are rooted in the past can act as signs of culture for the region and present them in the form of monuments for humans.

Accordingly, it is considered that architecture is inspired by religious, national and regional beliefs, and it can also be concluded that symbols and signs are actually elements in architecture that carry the messages of architects, religious, national and regional beliefs, whether openly or secretly. The findings of the present research showed the significant impact of symbols on contemporary architecture. The art of architecture has been a sign of the power of governments since ancient times. Iranian architecture has benefited from past experiences in its evolution, and at the same time, it has had its own characteristics. Therefore, apart from the Islamic culture that creates common ground between Iran and other Islamic nations, it should be noted that Iranian architecture should also know the history of pre-Islamic architecture in Iran.

Natural signs and environmental symbols are manifested in geometric shapes, colors, Eslimi, Khatai and plant motifs, animal motifs, and the four elements of fire, air, water and earth, etc.

Among the relationships investigated in this research was the correlation of Eslimi, Khatai and plant motifs with contemporary architecture. The continuous and simple lines in the form of spiral circulations on the surfaces were certainly among the first pleasant and artistic arrays and shapes that humans used to beautify various surfaces. These lines had the ability to create aesthetic effects of engraving by expanding on any surface. Eslimi motifs, which have their roots in Iranian culture and art, are a clear example of these abstract forms. They have been used as one of the main motifs in all

kinds of works of art such as architecture, book design and artificial arts. In this regard, the findings of Sakizadeh and Jafari Dehkordi (2017) showed that contemporary Iranian graphic designers have used Eslimi motifs in the design of signs with cultural, commercial, political and social issues. It is worth noting that it has been most used in the design of cultural signs and often in combination with writing or images. According to Maroufi (2016) and Mohebbi Gerami et al. (2021), among the studied symbols, plant symbols have been more oriented towards abstract design style. In addition to the role of flowers, designers, in using the role of Eslimi, have presented its potential in a variety of cultural, social, production, political, and commercial applications, in a maximum and actual manner. In addition, most of these symbols have been used in cultural contexts and were mostly combined with images or writing.

Another relationship investigated in this research was the correlation of the four elements with contemporary architecture. Paying attention to the four elements of water, earth, air and fire has existed in Iranian traditional architecture and also in Iranian gardens since long ago. The natural elements that have received more attention in Iranian gardens included water, earth, air, light, animals, plants and elements such as mountains and sky; special attention has been paid to the harmony among natural elements (including water and soil) or between natural and architectural elements (Shahbazi et al., 2013). The four elements became gods in the thought of the ancient world and found a strong place in a symbolic form. Successive transformations in nature with the symbolic expression that is the continuous conflict of elements created many narratives. According to these symbols, the creator drives a wheel with four horses in the sky and turns it in a circle. The first horse with a golden saddle and bridle, which runs this constant circle with strength and agility as much as possible, is the symbol of fire. The second horse, which is lower in agility and strength and with a cover that is dark on one side and bright on the other, is the symbol of air. The third horse is slower than the first and second horses and symbolizes water. The fourth horse at one point slowly turning around pulling on the reins and the three horses surrounding him symbolize the earth. The moon is seen as the bringer of rain in the tomb of Naghs-e Rostam. Another symbol of water is the mountain goat. Its role with its horns larger than its usual limbs in the shape of a crescent moon has been a symbol of rain.

5. Conclusion

The present study dealt with the analysis of the issue of recognizing the permanence of symbol concepts in the formation of the body nature of traditional Iranian architecture and their effects on contemporary architecture

between 1941 and 1981. Based on the study of the opinions and efforts of expert architects in this field and according to the investigations (including the examination of buildings and data from questionnaires), more abstract symbols have been more eternal in contemporary architecture. In fact, the factor of abstraction was recognized as one of the most important factors for the immortality of symbols during the transition from traditional to modern architecture. This is the reason why animal motifs, unlike four main states of matter and plant motifs, have been eliminated from the most used symbols in contemporary architecture.

Authors Contributions

Authors have equal contribution role in preparing the paper.

Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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