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Original Research Article

A Study of the Comparative Architecture of the First and Second Pahlavi Periods from a Semiotic and Semantics Approach (Case Studies: the Museum of Ancient Iran and the Museum of Contemporary Art)*

Adib Ahmadi[1], Mohammad Azad Ahmadi[2**]

1. Department of Architecture, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.

2. Assistant Professor, Department of Architecture, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran.

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Abstract

This study analyzes the constituent layers and effective factors in the construction of permanent buildings, as well as how to evaluate and classify the types of signs and semiotic and semantic views in, to emulate the original Iranian architecture. A comparative content analysis and a semiotic and semantics approach were used to analyze the data gathered through library and field studies. Different levels of semiotics and the views of theorists in this field were studied, and then a comparative study of the two museums was carried out and the similarities and differences between the basic components of these two buildings were studied. Then, with the initial coding and categorization, while analyzing the concepts, explicit meanings, implicit meanings, and symbolic meanings were extracted. The research findings show that museums are composed of different layers that are in unity and integration with each other and meanings and concepts through five layers with the titles of construction layer, environment, access, physical-functional layer, and landscape. The study shows that the legibility of the architecture of museums is achieved by paying attention to the layers of its structure and making sense of the design according to those layers. The designers of the museums under study have tried to pay attention to the levels and layers that make up museums while paying attention to the desired functional aspects. Reflect the aesthetic concepts of Iranian architecture while paying attention to the needs of users, recreating the concepts of Iranian architecture.

Keywords: *Semiotics, Levels of Meanings, Iranian Architecture, Layers of Architecture, Coding.*

Introduction and Problem Statement

Semiotics and semantics are known as subjects with a close relationship with architecture. Architecture is a means of mass communication that conveys a set of different signs and messages to its audience to establish communication. Despite numerous efforts made in the field of semiotics analysis and exploration in recent years, we see the construction and creation of works bound by the common architectural approaches and styles of contemporary architects who not only lack adequate knowledge

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** Corresponding author: +989188711988, m.a.ahmadi@iausdj.ac.ir

of the accurate application of this science but also disable their audience in the correct recognition of symbols and signs and different interpretations of the meanings used in different layers of the Greek language. The purpose of this paper is to extract and revive authentic Iranian architectural paradigms by analyzing great architectural works created by famous architects. Therefore, the main question is, "What are the effective factors in the longevity of the magnificent buildings in the first and second Pahlavi periods using the semiotics and semantics approach?" In this paper, the relationship between the Museum of Ancient Iran and the Tehran Museum of Contemporary Art was first examined in terms of culture within its society. Then, the concepts and basics of semiotics and the different views of Peirce, Saussure, and Eco were reviewed, followed by a presentation of the research methodology. Afterward, the data gathered were categorized to achieve the following research goals:

1. Evaluating different viewpoints in the field of semiotics and interpretation of meaning as well as discovering the similarities and differences between them
2. A comprehensive examination of the buildings of the Museum of Ancient Iran and the Tehran Museum of Contemporary Art
3. Developing a scientific method for coding, categorizing, and initial extraction of concepts at the first, second, and third levels in the form of explicit meanings, implicit meanings, and symbolic meanings.

Literature Review

• Meaning and semantics

In the Mo'in Encyclopedic Dictionary, the definition of the word "meaning" is presented as intended, intention, purpose, the implication of speech, the implication of discourse, truth, content, subject, and conscience (Mo'in, 2006, 1777). Castells considers "meaning" as experience and memory for humans. Defining Lynch believes that "meaning" is a feature of the environment that can connect a person to other aspects of life (Pourjafar, Sadeghi & Yousefi, 2009). Ullman sees "meaning" as a bilateral relationship between "mental image" and "word" (Sholeh, 2009). "Meaning" is the validity, content, and message (whether intellectual or emotional) of an event (Pourjafar et al., 2009). The conveying of meaning is merely possible when there is a semantic exchange between the sent data by the sender and the information and assumptions in the recipient's memory (Soleimani, Eetesam, & Habib, 2016). Garmas calls semantics a knowledge that explores and analyzes the fundamental constructions of the meaning-making process. Semantics involves the intellectual meaning of words and explores the content concept of signs (Sholeh, 2009). Examining different levels of meaning seems to be one of the most crucial categories in the study of semantics. These levels are divided into three classes: main or explicit meanings, implicit or binding meanings, and symbolic meanings. The main (explicit) meanings indicate the main function and direct meaning of a word and the sign term of the text. The implicit meaning has an intermediate nature, while the symbolic meaning has a symbolic nature and mostly emphasizes socio-cultural and historical aspects. These different levels of meaning enable us to distinguish between the function, or how to directly benefit from an object, and the social understanding of that object. Semantics in architecture has also formed a strong and tight bond with the science of semiotics, and thus, considering and analyzing these two concepts appears essential to better understanding the relationship between architecture and semiotics.

• Sign and semiotics

A sign is something that predisposes some aspects and capabilities of a certain person to something else (Dianat, 2016). A sign is a visual name that visualizes the subject in a simple, useful, and brief way (Pourjafar & Montazer-Al-Hojjah, 2010, 18). The

sign always summons the meaning as the meaning appears in the sign (Sholeh, 2009). Anything that indicates other things in any way is considered a sign. In terms of sign identity, one can say that the sign is a tangible phenomenon and event with the property of observability. Also, due to its connection to the absent phenomenon, it replaces and signifies it, and it necessarily has a material form to be understood and received by human senses.

Semiotics is a science concerned with signs and meanings that investigates and deals with the various types of signs and meanings of work, as well as the factors influencing the production process, their exchange and interpretation, and the rules governing signs (Bagheri & Einifar, 2013). Semiotics can be recognized as a kind of science and an orderly and organized reading of events about all the sets of influential factors in the creation and interpretation of signs (Pourjafar & Montazer-Al-Hojjah, 2010, 17). Semiotics also reveals to us the constituents of signs and the rules and regulations that govern them.

The knowledge of semiotics and semantics are defined in a close relationship and bind with each other from the perspective of the linguists of our time. Thus, Morris believes that semantics is a part of semiotics knowledge, which explores and ponders the meaning of signs and the relationships between the sign and the mental reference (Sholeh, 2009). Semiotics is derived from two main constructivism and post-constructivism approaches. Constructivists such as Saussure, Jacobsen, etc., often are specialized in the field of linguistics and usually consider a direct relationship between the signifier and the signified. Post- constructivists such as Peirce, Eco, Derrida, etc., unlike the first group, consider the relationship between the two to be indirect and seek to understand implicit and hidden signified in the social, logical, and aesthetic issues. Also, post-constructivists deal with multiple aspects, internal layers of the text, intertextual communication, and the delayed action of meaning (Dabbagh, 2016).

The Views on Semiotics Filed

• Charles Sanders Peirce's point of view

Charles Peirce was a pragmatist philosopher and one of the founders of semiotics (Roshan & Sheibani, 2015). A sign is something that is exposed to an object to interpret a third thing, which is called an interpretation (Qaeminia, 2007). Peirce called "everything that somehow informs" a sign. Signs are the fabric of all thoughts and all studies, and the life of thought and knowledge is the very rational life of signs (Razavifar & Ghaffari, 2012). Peirce has presented a three-fold model (three-faceted) under the titles of representation, interpretation, and subject (image, index, symbol) for the sign (Fig. 1). In image signs, the relationship between the signifier and the signified is based on similarity. For example, a picture of a painting or a photograph of a person is an iconic sign of that person that is being represented. In indexical signs, the signification is based on proximity, and the sign is in a direct relationship with its subject; it is not contractual either. For example, the footprints of animals are a sign of the movement of a certain animal in a certain direction. The semantic relationship between the signifier and the signified in symbolic signs is based on predetermined social conventions. For instance, a white dove is a sign of peace, or in the example of a traffic light, the color of each light is a sign of movement, stopping, and caution.

• Ferdinand de Saussure's point of view

From the perspective of Saussure, semiotics is a knowledge that focuses on examining and exploring sign systems such as languages, ciphers, mark systems, etc. (Mirgholami, Shahanaghi & Robati, 2013). Saussure provides a two-faceted or two-part model of the sign. According to him, a sign consists of the signifier and the signified (Nejad Ebrahimi, Gharehbeiglu & Vafaie, 2019). It provides "the concept that the signifier implies, or the conceptual idea," and talks about the relationship between these two internal elements of the sign with the title of

"signification" (Sekhavat Doust & Alborzi, 2018). As seen in Fig. 2, the signifier and the signified are inseparable from each other like two sides of a paper, and are also in direct relationship with each other, and neither of them has precedence over the other. No meaning emerges without the signifier and the signified.

• Umberto Eco's point of view

Describing the sign, Eco says: "Whatever puts and introduces something in place of something else based on predetermined social conventions is a sign" (Pourjafar & Montazer-Al-Hojjah, 2010, 16). Eco adopts a hybrid approach that has given more importance to the post-constructivists' view over time. He believes that we need to talk about the sign role rather than the "signs" in semiotics. The sign establishes a contractual relationship between the expression and the content. In this regard, the content itself is made and processed by a certain culture. Thus, the expression returns to culture in the first stage (Eco, 2008, 9). His semiotic ideas have mostly relied on cultural issues along with the exploration and explanation of cultural, literary, artistic, and social signs. The following table summarizes the theories of Peirce, Saussure, and Eco along with their similarities and differences (Table 1).

According to the structure and research process, a model was used in this paper for semiotic analysis in buildings, which is based on Peirce's theory on semiotics (Fig. 3). In this model, different types of signs address the three categories of form-aesthetic, semantic signification, and socio-cultural aspects on the three iconic, indexical, and symbolic levels. Thus, these three categories will represent explicit, implicit, and implied or symbolic levels of signs.

Research Method

A comparative-content analysis and a semiotic and semantics approach were used to analyze the data. Regarding the type of research, this study is considered qualitative research. Based on the definition, the comparative method mainly has a qualitative essence, in which comparable data from at least two populations are collected and their differences and similarities were compared (Mirmogtadaie, Mousavian & Gomarian, 2015). Qualitative research is a method that focuses on phenomena that are happening in the natural environment and seeks to describe, explain, and interpret the phenomena according to the meanings given to them by people. In qualitative research, knowledge moves from the shell to the layers in the depth, and the facts will be revealed after reading and understanding the phenomenon. Accordingly, qualitative studies provide the researcher with a clear vision of the studied subject (Heidari, 2016, 188). Qualitative content analysis can be defined as a method for the mental interpretation and description of the content of textual data through the processes of systematic categorization, theme-making, and the coding or designing of known patterns (Tavakolinia, Sarafi & Dastvare'h 2017). Content analysis allows researchers to rationally explain and interpret the nature and authenticity of data using scientific methods. Language semiotics, according to this study's approach, is a system of signs, symbols, and codes that includes both semantic-conceptual and structural aspects. No sign individually makes sense; rather, it becomes meaningful in association and connection with other signs, and in the realm of discourse, one of the mental concerns of semiotic architects is to figure out how and with what tools in architecture they can convey concepts and findings to others. As stated before, the comparative content analysis method was used in this paper to classify the obtained data. In this approach, the analysis of data was based on the comparison and mental analysis of the authors. The research process included an initial description of the buildings of the Museum of Ancient Iran and the Tehran Museum of Contemporary Art, their classification, and a conclusion of their characteristics, followed by a

Table 1. The classification of different views on the subject of semiotics. Source: Authors.

Pierce	Saussure	Eco
• Post-constructivist (pragmatist) • Triple model (representation, interpretation, and topic) • Everything that gives information is a sign • Philosophical orientation (mental and physical) • Another name of the sign is logic • Attention to the process of production and interpretation of the sign (same as semiotics) • Expressing the contractual relationship between the signifier and the signified • There is a contractual relationship between expression and content. Realist	• Constructivist • Dual model (like two sides of a coin) • Paying attention to examining the signs themselves • Examination and centrality from the social perspective • Examining semiotics in the form of linguistics • The concurrent relational affiliation of each sign with other signs • The knowledge of exploring and analysis of sign systems (not the science of studying individual signs) Nominalist	• Post-constructivist (pragmatist) • Dual semiotics based on communication process and signification process • Social-cultural orientation • Attention to social communication and philosophy of language • Seeking to answer semantic and pragmatic issues • Reflecting and analyzing the concept of a sign in relation to other signs • Combining and integrating pragmatics and semantics
Similarities	Differences	
• An icon according to Peirce is the very same symbol according to Saussure. • Peirce's opinion is similar to Saussure's in terms of determining the characteristics of linguistic signs. • Saussure's and Peirce's views are similar concerning the quality of the conventional feature. • Both Pierce and Eco express the post-constructivist point of view. • The role of the interpreter is important in the views of all three. • There is the signifier and the signified (representation and interpretation) in the view of Saussure and Peirce.	• According to Saussure, the symbol is the natural relational expression between the signifier and the signified, and Peirce believes that the symbol is a type of convention. Saussure exclusively deals with linguistic signs, but Peirce admits the diversity of signs. Peirce's point of view is based on the analysis of thinking (logic), but Saussure deals with linguistic aspects and Eco addresses socio-cultural aspects. • The subject exists in Peirce's view, but it has no place in Saussure's model. • Saussure and Peirce have advanced their definitions of the sign in an abstract system, but Eco believes that defining the sign in an abstract system will significantly limit the functions of semiotics. • Dual oppositions are raised in Saussure's theory, but such a link is not seen in Peirce's and Eco's theories. • Unlike Saussure, Peirce's activity and attention are focused on the process of creating and interpreting signs or signification, but Saussure pays attention to the signs themselves.	

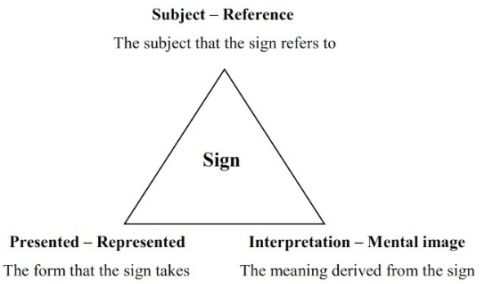

Fig. 1. Peirce's semiotic triangle. Source: Dabbagh & Mokhtabad Amrei, 2015.

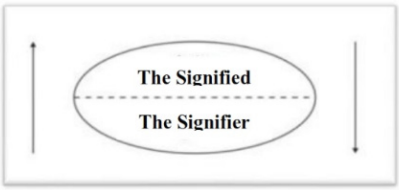

Fig. 2. The relationship between the signifier and the signified from Saussure's viewpoint. Source: Moradi & Sharifabadi, 2018.

comparison of the obtained general indicators in the meanings and concepts of the buildings. At this stage, the field study was carried out through observation and the presence of the authors themselves in the buildings. Accordingly, the primary data was collected by reading the texts and exploring the papers and writings of the experts through the library and document methods. Then, the qualitative data were categorized into five layers with the headlines of structural, environmental, accessibility, physical-functional, and landscape layers. After coding and initial classification, while analyzing the concepts in the first, second, and third levels, the concepts were categorized and extracted as explicit meanings, implicit meanings, and symbolic meanings.

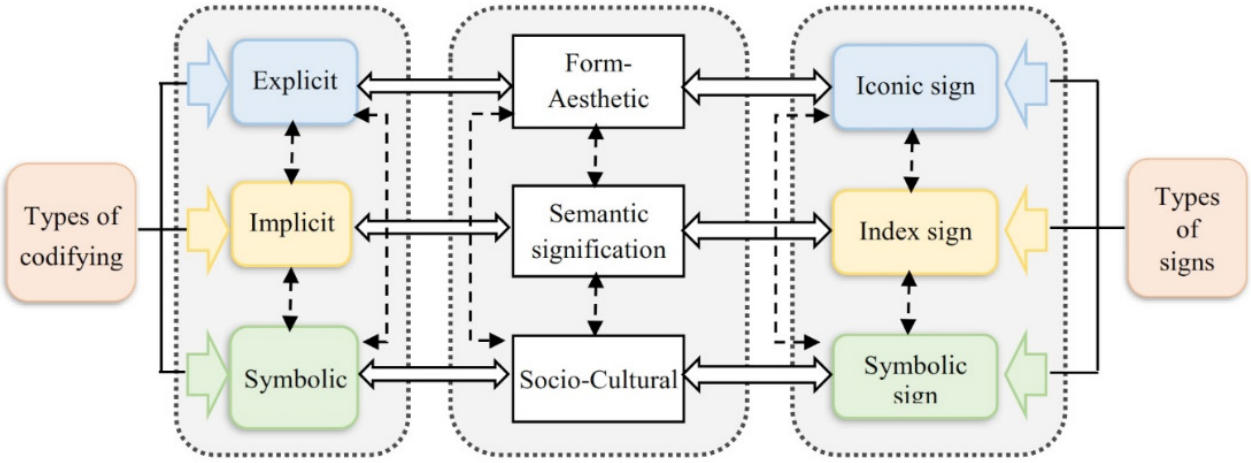

Fig. 3. The model used in the semiotics approach in this research. Source: Authors.

The Architecture of the First and Second Pahlavi Periods

In the 14th Solar Hijri century, when the Pahlavi government got into power, fundamental changes began in Iranian architecture (Haghjou, Sultanzadeh, Tehrani & Ayvazian, 2019). If we consider the first Pahlavi era the period of simultaneity with the emergence of the first stages of industrialization and changes in the country's cultural, political, and economic areas, the second Pahlavi era can be considered the era of development and expansion, continuity, and progress of modern Iranian architecture (Kamelnia & Mahdavinejad, 2016, 226). This wave of modernism, coinciding with extreme westernization and the evolution of social and artistic criteria and values, affected the whole society and, ultimately, architecture. Due to the differences in the political and ideological tastes and tendencies of this era, which were rooted in the political, religious, and ideological currents of the late Qajar period and the beginning of the Pahlavi era, different and, in some cases, conflicting attitudes and approaches appeared in the architecture of this era (Haghjou et al., 2019).

The architectural approaches and trends of the first and second Pahlavi periods can be expressed as follows:

• The first Pahlavi era

A. Islamic and traditionalistic architecture (combining the Isfahani style with modern functions and technologies)

B. Integrated architecture (combining and integrating past Iranian architecture with contemporary Western architecture)

C. Neoclassical architecture (rationalist neoclassical style)

D. National style (Archaism, modeling after the architecture of the Achaemenid and Sasanian periods)

E. Superior modern architecture (utilizing modern architectural styles such as international style and Art Deco)

• The second Pahlavi era

Islamic and traditionalistic architecture approach (benefiting from the concepts of Islamic architecture, the tendency towards historical architecture)

Modernism approach (benefiting from the concepts of international style architecture and modern architecture)

Iranian quasi-modernism approach (tendency to localism and historicism in the framework of modern architecture) (Haghjou et al., 2019) and (Kamelinia & Mahdavinejad, 2016, 226).

Some of the prominent works of the first period include the Museum of Ancient Iran (Andre Godard), Alborz High School (Nikolai Markov), Toopkhaneh Square, etc. Also, some of the great works of the second period may be named as Tehran Museum of

Contemporary Art (Kamran Tabatabai Diba), Azadi Tower (Hossein Amanat), Mausoleums of Kamal-ol-Molk, Avicenna, Baba Tahir (Houshang Seyhoun) and others. In this paper, two prominent works of the Museum of Ancient Iran and the Tehran Museum of Contemporary Art were chosen in the first and second Pahlavi periods according to the abovementioned, and the processes of analyzing, coding, and extracting concepts were begun.

Samples

• Ancient Iran Museum

One of the crucial events in the contemporary history of Iran is the design and construction of the first independent building under the title of "Museum" in 1937 in Tehran. The best and most prominent manifestation of Sassanid architecture can be observed in the design of the Museum of Ancient Iran (Akbari, Bazrafkan, Tehrani & Soltanzadeh, 2018). The architect has designed this museum in a north and south direction (Rad & Ghobadian, 2018). The overall volume of the building is drawn as a horizontal-rectangular cube. The building has an entrance porch, which encompasses the height of the building on one floor. All the lateral surfaces of this rectangular cube are covered with windows that are placed inside the brick surfaces (Khanizad, 2012, 103). This designed plan with a central courtyard, an arched entrance, and the use of red bricks and decorative columns clearly represents the characteristics and manifestations of Sasanian and Parthian architecture, especially in Ardeshir palaces in Firozabad and Ctesiphon (White) palace (Rad & Ghobadian, 2018).

• Tehran Museum of Contemporary Art

One of the most prominent and important projects of Kamran Tabatabai Diba is the design and construction of the Tehran Museum of Contemporary Art. The idea of the museum design originated from and was derived from the works of Le Corbusier, Louis Kahn, Josep Lluis Sert, and Frank Lloyd Wright, as well as the design of the rooftops of the desert areas of Iran (Bani Mas'ud, 2011, 328). The museum building is known as one of the most precious and rare examples of modern Iranian architecture, which is built by modeling Iranian philosophical concepts and traditional architecture. Charsou (intersection), the vestibule (Hashti), Archway (Sabat or sunshade), and passageways are considered to be charming elements of this exquisite complex. The galleries that are built in relation to each other with unique ups and downs make the visitor go around the main space of the museum in a circular path, and the end of the last gallery comes to the entrance of gallery No. 1 and the vestibule (Hashti) of the complex. To benefit from light wells derived from windcatchers in desert areas, both common rural arches and the combination of stone and concrete have been used in this building and turned into a magnificent and unique work. The galleries, corridors, and largely the entire general layout of the building follow a completely modern spiral pattern. This design style and the trend suggest that it is possible to integrate and combine the principles of modern and traditional architecture, while also seeming to pay tribute to traditional architecture.

Results

Some classifications needed to be made regarding the analyzed buildings in this research aimed at categorizing and codifying the analyses to achieve the concepts and signs used in these buildings through analyzing these categories. Thus, explicit meanings, implicit meanings, and symbolic meanings were extracted with primary coding and classification, meanwhile analyzing the concepts in the first, second and third levels. Thus, the generalities and structures of these two museums were coded and categorized in five layers, which were briefly reviewed below:

• The layer of construction

The meaning of construction system is the process and way of using consumable materials in terms of type, texture, color, and arrangement methods to

construct buildings (Hamejani, Bayazidi & Sahabi, 2018). Mies van der believes that architecture should pay attention to construction and designers need to be directly involved with the category of construction. After understanding what the materials can be used for, the architects would decide to use them in which part of the building or to integrate and combine what other materials and elements for making building elements that will have the ability to create the desired function.

Humans are sensitive to the materials they pass by or step on, and the space created by the building inside or outside. These spatial imperceptible, just like materials and details, directly affect us, and that is why we respond to them intentionally or unintentionally (Carter, 2007, 234). Each of the materials used in the construction of a building owns a unique set of physical features in interaction with the exterior environment. The construction system is known as how to use new tools, and different types of materials, and how to combine and integrate integral materials and elements in every building as one of the most basic parts of the design process, which has the potential to clearly display the fundamental ideas and concepts fostered in the architect's mind. In the ideas of Kamran Diba, influenced by Western architecture and modern construction technologies and the integration of this architecture with Iranian-Islamic architecture by using materials such as concrete, stone, and their combination with natural elements, a building with the material and type similar to other authentic Iranian buildings has been created. Although Diba has created a new building, he has somehow benefited from the elements and texture of architecture that remind us of Iranian architecture. If the local texture of different districts of Tehran and its surroundings, in which, stone has been used due to its summer residence, is kept in mind, it will remind us that they are just like the stones used in the Museum of Contemporary Art (Fig. 4). Also, the color of the concrete used in the facade of the building is reminiscent of the colors used in the buildings in the desert regions of Iran. The mentioned characteristics bring the association of the fact that this complex, besides being exquisite and original, is rooted in this homeland and is appropriate and similar to the architecture of this land.

In the design of the Museum of Ancient Iran, Andre Godard has used materials such as wood, stone, and brick in the walls of the building and has caused a reminder of pre-Islamic Iranian architecture by creating a depression in the entrance of the building and constructing decorative pseudo-columns (Sassanid architecture) (Fig. 5).

• The environmental or peripheral layer

The environment has a structure and reflects the relationships and interactions between people and the surrounding physical elements. These relationships in the physical environment are first of all spatial, and primarily everything existing in the environment is differentiated by space. One of the efficient areas in the field of environmental psychology relies on the fact that space has a social-collective logic, and architects can predict how to organize the space for social purposes by analyzing the spatial structure and the activities and activism of the users (Daneshgar Moghaddam, Bahreiny & Einifar, 2011). Man recognizes the environment through understanding the environment, its constituent parts, and their process and pattern of communication and relationships, and then, he moves in the environment. By remembering the constituent of the environment and depicting them again in his thoughts, he interprets and describes that environment (Pourjafar & Montazer-Al-Hojjah, 2010, 28). The architectural environment consists of various forms and levels and layers of materials with different lighting, color tonalities, textures, and various degrees of transparency and the spaces between them. The presence of soft elements such as green plants, water, etc. largely moderates the rough and hard artificial elements and causes the appearance of sensory richness in the environment,

Fig. 4. Tehran Museum of Contemporary Art. Source: Momeni & Masoudi, 2016.

Fig. 5. Museum of Ancient Iran. Source: Khanizad, 2012.

leading to a pleasant and desirable perception in the person's mind (Figs. 6 & 7). Also, it leads to peace of mind by overcoming the artificial environment (Masnavi & Vahidzadegan, 2014). Understanding nature and its constituent elements have a mutual impact on the sociability of the space and strength the sense of dynamism and inner comfort, which causes the formation of centers of activity in different parts of public spaces. The proper organization of spaces and spatial arrangement in the National Museum of Ancient Iran and the Museum of Contemporary Arts is as such to augment social interactions and optimal privacy tailored to the use of spaces by integrating the complex with green spaces and its constituent elements, including paying attention to the position of the pond or fountain, trees, the central courtyard, the location and arrangement of the buildings and the paths leading to the main buildings in the site of the complex.

• The layer of accessibilities

In a general sense, accessibility can be defined as the easiness of reaching places that seem attractive. Francis (1989) has identified three types of access, which are physical, social, and visual accesses.

Physical access: The access barriers such as doors, gates, walls, fences, and change of level need to be considered versus access.

Social access: All social classes, levels, and layers must have the ability to use the space. Preventing the use of space for certain classes of society is a kind of social restriction and monopoly and reduces the desirability of space.

Visual access: The possibility of seeing the space has been proposed for visual access (Saeidi Rezvani, Daneshpour & Daneshpour, 2014).

Pasini believes that accurate and optimal navigation in the environment partly depends on the ability of imagination and visualization of the creator of that environment of all the experiences that will happen in that environment (Pourjafar & Montazer-Al-Hojjah, 2010, 31).

Most of the routes, such as the streets and access to the buildings around the Museum of Ancient Iran, are linear and perpendicular to each other. In any case, a straight path can be the main organizing element of a set of spaces; it can be arched or broken, intersect other lines and paths, branch off, or become circular (Rad & Ghobadian, 2018) (Fig. 8). In the Museum of Ancient Iran, access to the interior spaces is through a direct route. Also, all corridors and accesses in the building, in linear and vertical forms, have not only led to order and organization of spaces but have also made the building attractive and sociable (Fig. 9). The connection and binding between the Museum of Contemporary Art and the natural environment surrounding the building are in such a way that evokes the meandering passages, passes, and movement paths of the textures of the traditional regions of Iran. Also, the combination and integration of the garden with the complex are associated with the structure of the Iranian garden (Fig. 10).

If we imagine the passages and passageways of traditional Iranian fabrics, we will remember the winding alleys and paths, in which, a person experiences the feeling

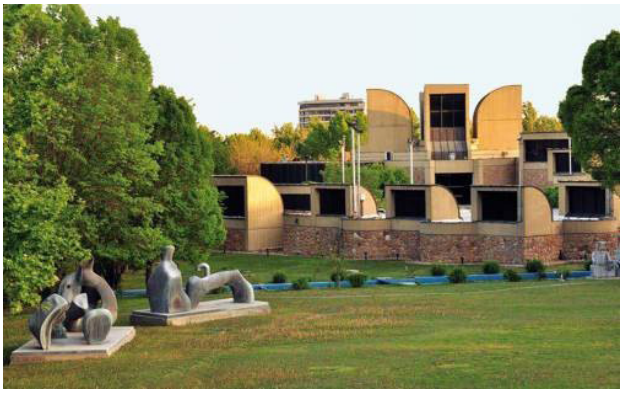

Fig. 6. The environment of the Museum of Contemporary Arts. Source: Momeni & Masoudi, 2016.

Fig. 7. The environment of the Museum of Ancient Iran. Source: Khanizad, 2016.

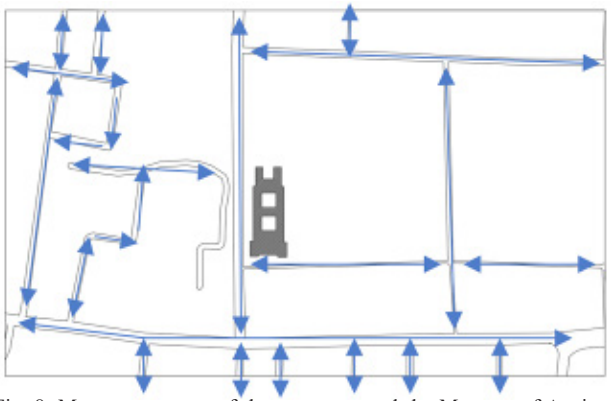

Fig. 8. Movement routes of the streets around the Museum of Ancient Iran. Source: Authors.

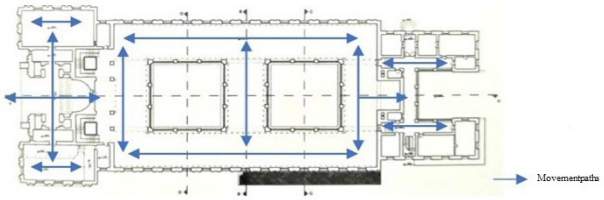

Fig. 9. Movement routes in the Museum of Ancient Iran. Source: Authors.

Fig. 10. Movement paths in the Museum of Contemporary Art. Source: Authors.

of satisfaction and diversity at the same time peace and comfort (Momeni & Masoudi, 2016). Fig. 11 illustrates that Diba also imagined these monuments in his thought while designing the museum building and tried to associate the memories of the observers of these winding passages and alleys and bring them into the mind. Thus, in the Museum of Contemporary Arts, paying attention to the organizing process of the filled and empty spaces in different levels of the site as well as the use of corridors that remind the architecture of passages of traditional Iranian textures have provided sufficient and proper areas in terms of quantity and quality for pedestrian movement, access, and presence.

• The physical-functional layer

The general part of human perception of space is initially visual, and visual perception is primarily spatial. By moving in space, the surrounding environment is experienced in the form of a sequence of visual stimuli, and in relation to the degree of connection and relationship between various stimuli in one space, that space is understood in a coherent and systematic way and a special feeling emerges towards it. In this case, the space will appear continuous and comprehensive and will have a strong, robust, and meaningful sense of place (Ghadami, Malekshahi, Akbari & Mohseni, 2011). Therefore, in an architectural work, it is not the case that a subtle inner harmony is created individually with related mechanisms. Rather,

Fig. 11. Access routes to Sheikh Lotfollah Mosque and Imam Mosque in Naqsh-e Jahan Square, Isfahan. Source: Authors.

a rich set of mutual relationships and correlations are going on. To understand the behavior and action of the building, it can be classified followed by exploring and analyzing its various basic functions. Describing the functions will reveal that each member is responsible for several applications and only a few of the functions of the building operate individually. Physical elements are combined and integrated into the Museums of Ancient Iran and Contemporary Arts in such a way as to induce a sense of peace and belonging to the place with the presence of people in the environment (Figs. 12 & 13). The placement of multiple openings and creating windward-like windows in the Museum of Contemporary Art and the arched windows around the inner courtyard in the Museum of Ancient Iran lets the light (which is a crucial feature in the physical environment) to enter the building at different angles, which specifies the physical location and its quality. The spatial organization according to the arrangement of spaces is made in such a way that through creating public lobbies and different floor levels and benefiting from special patterns in the spatial division, besides strengthening the activity of users in the space and smoothing the formation of collective relations, suggests that the spatial relationships in these buildings are not organized poorly; rather, they are affected by a coherent and strong structure and influenced by the users' interactions.

The Geometry and use of Spaces

In the design of the Museum of Ancient Iran, Andre Godard has used the above-grade volumes of the cube, rectangular cube, and the Persian arch and has resolved the needs of the complex with a special layout and arrangement (Fig. 14). Also in the Museum of Contemporary Art, the volumes of cubes, rectangular cubes, and also the semi-circle curves on a small scale have been used under the title of a place to present contemporary works of art, and the completeness of this use is examined through the study and analysis of its constituent elements (main, administrative, welfare, and other sectors) (Momeni & Masoudi, 2016). On the other hand, the composition and proportions of the form and volume of the museum are read in connection with its comprising spaces. Thus, the requirements and functional indicators of the museum have been carefully met from the spatial arrangement perspective (Fig. 15).

• Symmetry

The main building of the Museum of Ancient Iran is formed of a rectangular cube stretched from north to south with multiple windows on the ground floor view, while the first floor has no windows, with a length of approximately 100 meters and a width of about 40 meters, which consists of a sequence of three parts in the form, function, and structure. The first part is the reception and introduction section of the museum; the second part encompasses the halls for presenting works, and the third part includes the research and administrative part of the complex, which design is largely inspired by modern architecture (Rad & Ghobadian, 2018). By reading the plan of the complex, we will realize that the volumes considered by the architect for the design of the building have symmetry (general symmetry) (Fig. 16).

By reading the plan of the complex and paying attention to the location of the galleries, entrance spaces, and corridors next to each other in the Museum of Contemporary Arts, we will realize that they have partial symmetry (symmetry in the component) (Fig. 17). The concept of symmetry, one of the major components of traditional Iranian architecture, has

Fig. 12. The interior space in the Museum of Contemporary Art. Source: Authors' Archive.

Fig. 13. The entrance space in the Museum of Ancient Iran. Source: Authors' Archive.

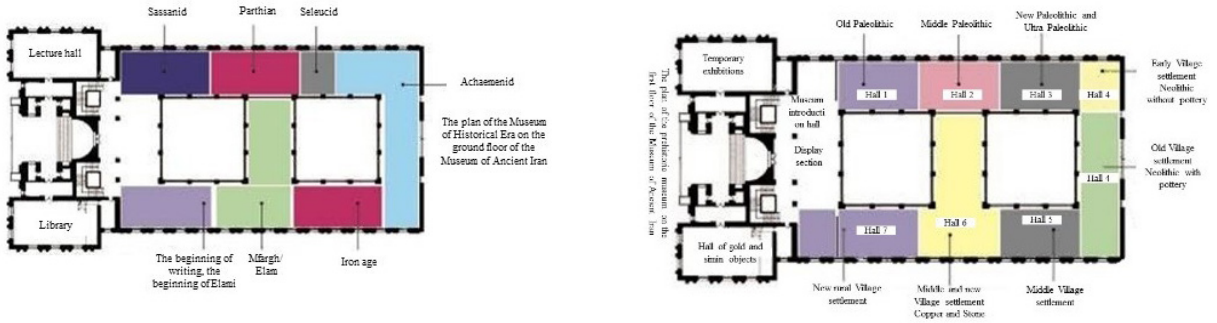

Fig. 14. The plan of the ground floor and the first floor of the Museum of Ancient Iran. Source: Rad & Ghobadian, 2018.

Fig. 15. The plan and layout of the Museum of Contemporary Arts. Source: Khanizad, 2012.

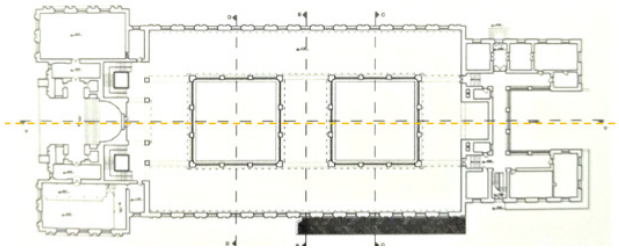

Fig. 16. Examining the symmetry in the Museum of Ancient Iran. Source: Authors.

been used in the design of the plan of the Museum of Ancient Iran and the Museum of Contemporary Arts, which itself somehow narrates Iranian architecture.

• Axis

Axis is a mental and systematic linear between two points or two functions. Besides revealing the directions, the axes are also linear and have dimensions. Axes always create a direction in a certain alignment that recalls everything to that direction. The human movement paths, direction, and vision in the building are constantly affected by facing these lines (Taghizadeh & Taqvai, 2020).

The designers of the Museum of Ancient Iran and the Museum of Contemporary Arts have utilized the main and secondary axes in designing the plans, which belong to the items typically used in traditional buildings and Iranian-Islamic architecture. This feature can be observed in most of the buildings (Figs. 18 & 19).

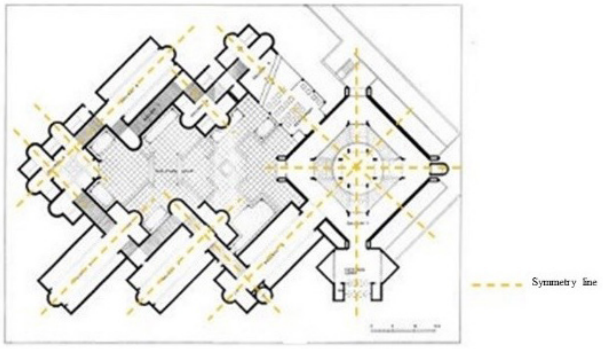

Fig. 17. Examining the symmetry in the Museum of Contemporary Art. Source: Authors.

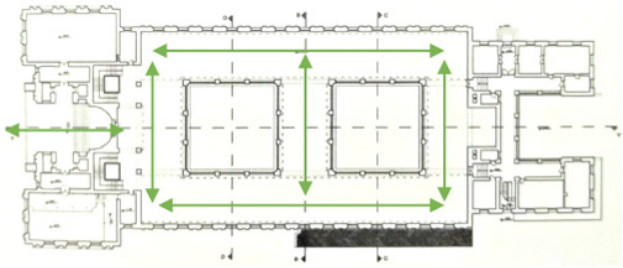

Fig. 18. Examining the axiality in the Museum of Ancient Iran. Source: Authors.

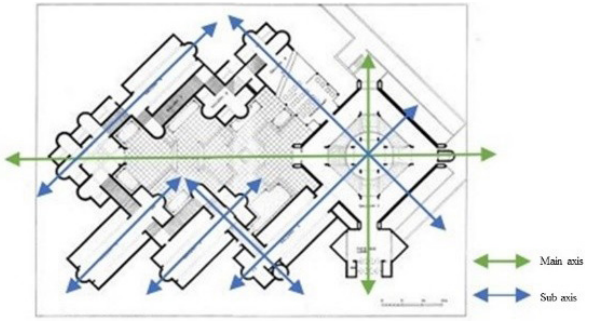

Fig. 19. Examining the axiality in the Museum of Contemporary Art. Source: Authors.

• The appearance of the past architecture

The composition of surfaces in the shape of an inverted U (arch-like) in the Museum of Ancient Iran, besides the appearance of the architecture and arch form of the Ctesiphon (White) palace in the Sassanid era, defines this type of combination feature to create a vestibule for entering a building, despite the fact that the building form itself represents a depressed entrance by its internal volume (Fig. 5). Spatial hierarchy, simplicity in the plan, purity in the volumes, visible columns in the outer volume of the building, and the materials used in this building altogether seem to be examples of Iran's past architecture.

Diba's work is a symbolic and metaphorical work and relates a world of meanings and concepts with small hints. For example, the shape of the skylights reminds us of windcatchers in the desert regions of Iran. The slow subsiding of the building into the ground depth (something that occurs in hot and dry desert areas), and thereby, the ups and downs of external volumes and numerous skylights make the exterior facade of the building similar to a native and traditional form; a structure which, of course, follows a certain discipline and regularity (Fig. 4). A space in the form of Iranian architectural vestibules with a Howz (symmetrical pool) within it similar to Iranian springhouses and semi-circular movements in the plan has been used in the Museum of Contemporary Arts (Khanizad, 2012, 109) (Fig. 20). He has also creatively benefited from the characteristics of Iranian architecture, especially the architecture of the edge of desert areas, which is quite evident in the museum building. Diba's use of soil-colored concrete and cob or skylights, framing the environment and surrounding nature, hiding facades under canopies, doors, windows, and arches all are his wise use of Iranian architecture.

The Landscape Layer

The landscape is a dynamic entity and makes a connection between people and places. The landscape, on the one hand, is influenced by the human being and how he relates to the environment, and on the other hand, appears as the association of memories that have happened in the context of the environment and affected the relationships between people and the landscape, and accordingly, has transformed the customs and civilization of humans. In the definitions, the landscape has always depended on two major elements that ignoring each of them may trouble the understanding of the landscape: The first is the environment encompasses humans, and the second is the human that enters the environment to

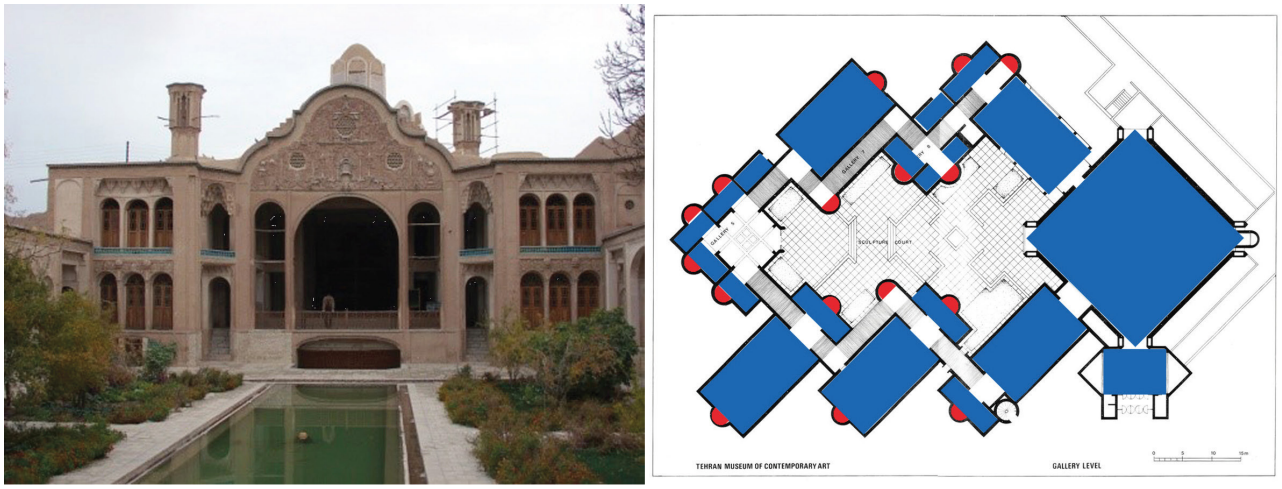

Fig. 20. The structure of the placement of spaces and light-wells in the Museum of Contemporary Arts. Source: Momeni & Masoudi, 2016.

understand and communicate with the environment and visualizes in his mind over the time (Mahan & Mansouri, 2017). In landscape, sensory perception implies visual aesthetics and intellectual perception implies symbolic aesthetics, symbolic meanings, and implicit meanings in contact with the place (Daneshgar Moghaddam et al., 2011).

By analyzing the Museums of Ancient Iran and Contemporary Arts, one can realize that the creators of these two works have sought to use natural elements inside and outside the building as much as possible and they have mixed the man-made elements with the natural elements and texture of the foundations of the buildings quite skillfully to successfully form a readable and harmonious combination with the natural environment and founded unique, lasting, and responsive results to the needs of the present age according to the thoughts passed through their minds. In front of the south side of the Museum of Ancient Iran, prior to entering the main area, a garden flaunts a large water feature (fountain), which is derived from the concepts and methods of Iranian garden-making (Fig. 21). In the Museum of Contemporary Arts, designing a sculpture garden and using the garden and integrating the complex with the green space of the garden associate the Iranian garden and the kiosk inside it, which again leads to the readout and representation of Iranian architecture (Figs. 6 & 22).

We realize by analyzing the features of these two buildings that the thoughts of the creators of these two works sought to construct a building to create a sense of belonging to the place, develop more social interactions and respond to collective needs, respond to the different functions of each component of the building, and also, cause the visual dominance of the spaces of the buildings on the environment of the site, and create a sense of continuity of reliability and comfort.

Data Conceptualization and Semiotics Process

The data needed to be coded in working with qualitative data to categorize and construct concepts. At this stage, the collected data were categorized into five layers as follows: Construction, environmental, accesses, physical-functional, and landscape layers. All concepts that could come to mind without ignoring or deleting were categorized as representation elements from both museums. Then, the concepts were extracted and classified by open coding of signs at the first level, i.e. in the form of explicit meanings. In the next step and at a higher level, the second-level coding or implied meanings were extracted. Ultimately, the third-level coding was extracted at

Fig. 21. The entrance to the Museum of Ancient Iran. Source: Authors.

Fig. 22. The site plan of the Museum of Contemporary Arts. Source: Khanizad, 2012.

the level of symbolic meanings (Fig. 23).

After specifying the architectural layers of the buildings of the two museums and their preliminary analysis, the elements that mattered to the architecture of both museums with the potential of being signs had to be extracted. Thus, in each of the layers, important elements and concepts from both buildings, which are actually representations of signs, were extracted and classified (Table 2).

After extracting the elements representing the signs, in this stage, the concepts related to the architectural layers were categorized in the first level and their explicit meanings were categorized and extracted. Then, these concepts and meanings were categorized and classified at a higher level of meaning, i.e., as implicit meanings. Finally, in the third level, which is the final level and in the form of symbolic meanings, the concepts were classified and categorized at a more general and abstract level (Table 3).

Conclusion

Meanwhile placing signs in the focus of its attention, Semiotics analyzes the implicit and hidden meanings. Semiotics and semantics are nowadays defined by having a close relationship and connection with each other. Thus Morris believes that semantics is a part of semiotics. The sign represents the semantic implications just as the meaning appears in the sign. In the field of architecture, semantics also appears to be in a strong and tight connection with the science of semiotics and it seems essential to focus on these two concepts and analyze them to better understand the relationship between architecture and semiotics. However, examining different levels of meaning is known as one of the most important categories in the topic of semantics. These levels were divided into three types in this paper: Main or explicit meanings, implicit or binding meanings, and symbolic meanings. Therefore, a model was used for semiotic analysis in the buildings of the Museum of Ancient Iran and the Museum of Contemporary Arts to realize the research goals. Accordingly, content analysis was done on the paper data followed by their coding aimed at achieving its different meanings and levels. Comparing the results of this paper with other studies, Hamejani et al. (2018) extracted the signs at two levels of meaning, i.e. explicit and implicit according to the research results in analyzing the architecture of Uraman Takht village from the semiotics perspective. The implied meaning was classified in the first to third levels. Finally, eleven items were extracted for the implied meanings of the third level as follows: Providing physical comfort and peace and psychological security, perception of nature, spatial coherence, readability of the physical environment, preciousness, space attendance, increasing the level of social interactions, ease of movement and access on foot, coordination, sense of social belonging, continuous attention to the concept

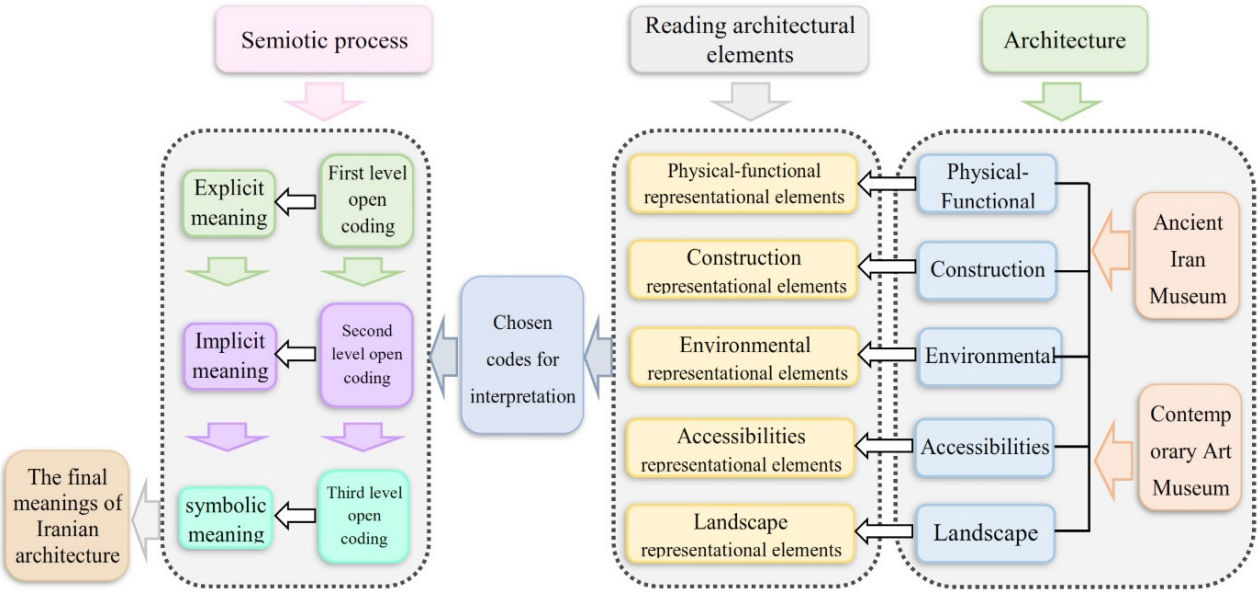

Fig. 23. The data conceptualization model and the process of semiotics and semantics. Source: Authors.

of fertility and birth, and promoting a sense of pride of social belonging. They ultimately suggested a symbolic meaning under the title "Uraman architecture is a sociable phenomenon aligned to improve the quality of collective life". Nejad Ebrahimi et al. (2019) regarding the semiotics in the architecture of the Blue Mosque in Tabriz, according to the research results, recognized the architecture as a part of a culture, on the one hand as a sign system, and on the other hand, as a means of communication. Also, as a result of their research, they obtained the factors of establishing communication and meanings in architecture in six items as follows: Cultural-social contexts, symbolic function, architectural codes, explicit use in the building, communication tools, and meta-architectural codes. Bagheri and Einifar (2013) also recognized semiotics in architecture to be related to the field of semantics and the design approach from performance to perception and considered semantics as a part of semiotics. They also suggested that what appears as architecture implies the concepts, for which, the architecture has been formed for its expression. They also obtained the signs in architecture in their research results in a quadruple spectrum of the icon (explicit meaning) such as decorative motifs, the profile-icon (implicit-explicit meaning) such as replicas and architectural maps, the index (implicit meaning) like a metaphorical building, and the symbol (symbolic meaning) as a symbolic building.

In this paper, by structurally exploring museums under the title of an important element in urban spaces and the ever-increasing necessity of these spaces as well as the analysis of these spaces in the form of layered semiotics, the layers of museums were identified and determined at five layers: construction, environmental, access, physical-functional, and landscape. According to the findings of this article, the museums themselves are composed of various layers that convey signs to the audience in the form of meanings and concepts through these layers. Thus, the reading of the architecture of the museums is obtained by giving importance and paying attention to the layers of its structure and the meaning of the design based on those layers. According to the analysis of the different layers constituting the Museum of Ancient Iran and the Museum of Contemporary Arts using the open coding method, the representation elements of signs were first extracted and shown in Table 2. Then, they were classified at three levels of

Table 2. The conceptualization of the data obtained from the research and extraction of representation elements. Source: Authors.

Architectural layers	Row (Museum of Contemporary Arts)	Representation elements of the signs of each layer (conceptualization with open coding) of the Museum of Contemporary Arts	Row (Museum of Ancient Iran)	Representation elements of the signs of each layer (conceptualization with open coding) of the Museum of Ancient Iran
Construction layer	Museum of Contemporary Art Construction layer-1	The main materials of the façade: Stone and brick	Museum of Ancient Iran Construction layer-1	The main materials of the façade: Stone and brick
	Museum of Contemporary Art Construction layer-2	The use of external wide walls	Museum of Ancient Iran Construction layer-2	The use of high and long walls
	Museum of Contemporary Art Construction layer-3	The use of metal windows (traditional form in the plan)	Museum of Ancient Iran Construction layer-3	The use of narrow and long traditional metal windows
	Museum of Contemporary Art Construction layer-4	The use of multiple stairs at the entrance of the building	Museum of Ancient Iran Construction layer-4	The use of wide disk-like stairs at the entrance of the building
	Museum of Contemporary Art Construction layer-5	The use of Howz (water element) in the courtyard	Museum of Ancient Iran Construction layer-5	The use of a water feature (fountain) and Howz (water element) in the courtyard
	Museum of Contemporary Art Construction layer-6	The use of regular cobblestones in the courtyard	Museum of Ancient Iran Construction layer-6	The use of regular cobblestones in the courtyard and outdoor space
	Museum of Contemporary Art Construction layer-7	The use of colored concrete in the color of soil and cob in the facade construction	Museum of Ancient Iran Construction layer-7	The use of red color (red bricks) in the facade construction
Environmental layer	Museum of Contemporary Art Environmental layer-1	Integration with the sculpture garden	Museum of Ancient Iran Environmental layer-1	Integration with the garden of the southern side
	Museum of Contemporary Art Environmental layer-2	The location of the building in the north and east of the garden area	Museum of Ancient Iran Environmental layer-2	The location of the building in the north-south direction (located in the north of the garden)
	Museum of Contemporary Art Environmental layer-3	Non-dense texture	Museum of Ancient Iran Environmental layer-3	Dense texture
Accesses layer	Museum of Contemporary Art Accesses layer -1	Creating boundaries between the area and the outer space	Museum of Ancient Iran Accesses layer -1	Creating boundaries between the area and the outer space
	Museum of Contemporary Art Accesses layer -2	The existence of a lobby at the entrance	Museum of Ancient Iran Accesses layer -2	The existence of a lobby at the main entrance
	Museum of Contemporary Art Accesses layer -3	The existence of public open spaces at different levels of the texture (context)	Museum of Ancient Iran Accesses layer -3	The existence of open spaces at a level
	Museum of Contemporary Art Accesses layer -4	Creating the hierarchy of the main ramp and galleries	Museum of Ancient Iran Accesses layer -4	Creating the hierarchy of the main lobby and galleries
	Museum of Contemporary Art Accesses layer -5	The existence of winding corridors in the plan	Museum of Ancient Iran Accesses layer -5	The existence of direct paths and vertical branches in the plan

Rest of Table 2.

Architectural layers	Row (Museum of Contemporary Arts)	Representation elements of the signs of each layer (conceptualization with open coding) of the Museum of Contemporary Arts	Row (Museum of Ancient Iran)	Representation elements of the signs of each layer (conceptualization with open coding) of the Museum of Ancient Iran
Physical and functional layer	Museum of Contemporary Art Physical layer -1	The existence of symmetry in the components	Museum of Ancient Iran Physical layer -1	The existence of symmetry in the whole
	Museum of Contemporary Art Physical layer -2	The existence of main and secondary axes in the building	Museum of Ancient Iran Physical layer -2	The existence of main and secondary axes in the building
	Museum of Contemporary Art Physical layer -3	The multiple uses of the rectangular form in the components	Museum of Ancient Iran Physical layer -3	The use of the rectangular form in the components and the whole
	Museum of Contemporary Art Physical layer -4	The use of gardens in the area	Museum of Ancient Iran Physical layer -4	The use of gardens in the area
	Museum of Contemporary Art Physical layer -5	The provision of lighting using wind catcher like windows	Museum of Ancient Iran Physical layer -5	The provision of lighting using arched windows (external and facing the central courtyard)
	Museum of Contemporary Art Physical layer -6	The presence of a semi-circle shape in the plan of the windows	Museum of Ancient Iran Physical layer -6	The presence of a semi-circle shape in the entrance façade and windows
	Museum of Contemporary Art Physical layer -7	The division space of the lobby and gallery No. 1	Museum of Ancient Iran Physical layer -7	The division space of the entrance porch
Landscape layer	Museum of Contemporary Art Landscape layer -1	The use of plant and natural elements on a micro-scale in the design and its combination with the environment	Museum of Ancient Iran Landscape layer -1	The use of plant and natural elements on a micro-scale in the design and its combination with the environment
	Museum of Contemporary Art Landscape layer -2	The use of a Howz (pond) and a water feature in the area	Museum of Ancient Iran Landscape layer -2	The use of a large Howz (pond) in the area
	Museum of Contemporary Art Landscape layer -3	Paying attention to the skyline	Museum of Ancient Iran Landscape layer -3	Paying attention to the skyline
	Museum of Contemporary Art Landscape layer -4	The use of Iranian architectural elements in the texture	Museum of Ancient Iran Landscape layer -4	The use of Iranian architectural elements in the texture

explicit, implicit, and finally symbolic meanings in Table 3 as 15 items, which include items such as the integration of technology and tradition, vernacular materials, climate design, Iranian garden-making, spatial legibility, transparency in Iranian architecture, etc. As a result, the surveys conducted show that, although these two buildings were designed at different times and by different creators with different attitudes, the creators of these works attempted to reflect the aesthetic concepts of Iranian architecture by taking into account the significance of these levels and their constituent layers while paying attention to desirable functional aspects and recreate the concepts of Iranian architecture while paying attention to the needs. Given the importance of semiotics and semantics in architecture, it is necessary to pay attention to signs and their meanings in design and go beyond functional and physical aspects.

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Table 3. First-level coding (explicit meanings), second-level coding (implicit meanings), and third-level coding (symbolic meanings). Source: Authors.

Architectural layers	Row	The type of selected codes for interpretation	First-level open coding (explicit meaning)	Second-level open coding, of the sign subject (implicit meanings)	Third-level open coding of the sign subject (symbolic meanings)
Construction layer	Museum of Contemporary Arts Construction layer-1-7	Body - Form	The use of accessible and low-cost new and local materials and continuous relationship with the natural elements	The appearance of Modern Iranian contemporary architecture with traditional architecture (desert and central areas)	Combining technology and tradition
	Museum of Ancient Iran Construction layer-1-7	Body - Form	The use of local and accessible materials and construction in the area	The appearance of Iranian architecture before Islam (architecture of the Parthian and Sasanian periods)	Vernacular
Environmental layer	Museum of Contemporary Arts Environmental layer-1&2	Function	The maximum use of solar light and energy of the sun	Climatic design suitable for Iranian Islamic architecture	Climatic design
	Museum of Ancient Iran Environmental layer-1&2	Meaning _ Aesthetics	Creating a suitable view and landscape toward the garden-like area	Attention to the principles of Iranian garden-making in landscaping	Iranian garden-making
	Museum of Contemporary Arts Environmental layer-3	Function	Maximum energy storage in cold seasons and providing natural light for galleries	Attention to climate issues	Energy sustainability
	Museum of Ancient Iran Environmental layer-3	Function	Creating a private space	Paying attention to native and traditional design after Islam	Iranian Islamic architecture
Accesses layer	Museum of Contemporary Arts Accesses layer-1-4	Function	Increasing per capita public and movement spaces in the texture	Easiness in movement and accessibilities	Spatial readability
	Museum of Ancient Iran Accesses layer-1-4				
	Museum of Contemporary Arts Accesses layer-5	Function	Ease of movement inside the galleries without disturbance	Winding corridors	The traditional texture of Iranian neighborhoods
	Museum of Ancient Iran Accesses layer-5	Function	Paying attention to vertical and perpendicular lines of movement in the plan	More readability	Traditional Iranian markets

Rest of Table 3.

Architectural layers	Row	The type of selected codes for interpretation	First-level open coding (explicit meaning)	Second-level open coding, of the sign subject (implicit meanings)	Third-level open coding of the sign subject (symbolic meanings)
Physical and functional layer	Museum of Contemporary Arts Physical layer-1-4 Museum of Ancient Iran Physical layer-1-4	Body - Form	The use of pure volumes, ease of movement, and easy access to the public lobby	Better movement and visibility in the direction of the axis, more readability	Transparency in Iranian architecture
	Museum of Contemporary Arts Physical layer-5&6	Function	Providing the lighting for galleries, maximum use of solar energy	The similarity in form to the wind catchers of the desert regions	The traditional architecture of the desert and central areas of Iran
	Museum of Ancient Iran Physical layer-5&6	Function	Providing the lighting for galleries, maximum use of solar energy	The use of traditional arched narrow windows	The appearance of native and traditional Iranian Islamic architecture
	Museum of Contemporary Arts Physical layer-7	Function	Creating a pause and public space	The use of the vestibule	Native and traditional Iranian Islamic architecture
	Museum of Ancient Iran Physical layer-7	Function	Creating a space of pause and public	The sign of the Taq Kasra	Parthian and Sassanid architecture
Landscape layer	Museum of Contemporary Arts Landscape layer-1&2 Museum of Ancient Iran Landscape layer-1&2	Meaning _ Aesthetics	Maximum use of natural elements	Creating a suitable view and landscape	Providing comfort and peace
		Social	Paying attention to human needs	Paying attention to people's suitability and better understanding and readability from a human point of view	A sense of belonging to a place and community
	Museum of Contemporary Arts Landscape layer-3	Meaning _ Aesthetics	Varied skyline at different levels	A sign of dense urban texture lines	The texture architecture of traditional Iranian neighborhoods
	Museum of Ancient Iran Landscape layer-3	Meaning _ Aesthetics	Smooth and uniform skyline in the entire complex	The sign of the straight and vertical lines of the texture of the surroundings	Parthian and Sasanian architecture
	Museum of Contemporary Arts Landscape layer-4 Museum of Ancient Iran Landscape layer-4	Meaning _ Aesthetics	The use of special elements in the body	Reminding the constituent components of Iranian Islamic architecture and strengthening the peace and comfort	Belonging to a place, Iranian Islamic architecture, identity-making

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