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Original Research Article

Explaining the Conceptual Model of the Aesthetic Relationship Between Structure and Architecture Based on the Grounded Theory Method with Emphasis on Contemporary Iranian Architecture*

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Abstract

Problem statement: The role of structure in the design and shaping of beautiful architecture is a critical issue. However, the role of structure in the beauty of the building has been less considered as an aesthetic issue in contemporary Iranian architecture, making it an important category to address.

Research objective: This research aims to develop a conceptual model grounded in the study of contemporary Iranian architecture to advance a theory of how structure shapes the creation of aesthetically quality architecture.

Research method: The present research is qualitative and based on the grounded theory method, which was used with an inductive and exploratory approach. The data collection method was based on interviews with 20 experts in architecture and structural engineering. The data analysis method is also based on three-stage coding in Atlas.ti software.

Conclusion: The findings of this research showed that integrating structure and architecture has led to the creation of beautiful, distinctive buildings due to functional diversity in the contemporary era. This research introduced purity and simplicity, integrity and independence of structure and architecture, geometry, rhythm and symmetry, and order and proportion as aesthetic characteristics resulting from the structure that can create qualities such as simplicity and expressiveness, flexibility, identity and narrative, transparency, extroversion and interaction between the inside and outside of the building. Also, background factors related to executive issues, interference resulting from interests and professional conflict, and the lack of mutual and interactive communication among professionals affect the formation of architecture based on the beauty of the structure.

Keywords: *Aesthetics, Structure, Architecture, Contemporary Iranian architecture, Grounded Theory.*

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Introduction

Structure and architecture are two key elements in the formation and emergence of space as a platform for human presence and life, and it has long been recognized that understanding architecture requires an appreciation of the role of structure. In fact, the desired human space results from the connection and interaction among structure, architecture, and their components in a harmonious, overlapping manner. However, the structure is an element that makes the form and shape of architecture possible, and "the form of the skeleton of a structure undoubtedly has a close relationship with the form of the building that carries it" (McDonald, 2014, 1). Therefore, it can be stated that the beauty of a form largely depends on the structure and its beauty. To understand the concept of a structure's beauty and its effects on form, it is necessary to consider aesthetics as the study and exploration of the beautiful. In the definition of aesthetics, it is usually considered as "the science of conditions related to the senses and perception" or "the philosophy of beauty" or "the identification of beauty and art in relation to a set of internal interactions and reactions…" which usually refers to visual perception (Eslami & Hadafi, 2011). Throughout human history, beauty has always been an inseparable part of human needs. This concept begins in the realm of determinism, then leads to indeterminism, and has always fluctuated between the two poles of subjectivism and objectivism. On one side, beauty is independent of the perceiver. It is sought in phenomena and, on the other hand, explored through the eyes of the beholder and the human senses (Pakzad & Saki, 2014).

As Carroll says, "the experience of beauty occurs where we perceive the aesthetic qualities and characteristics of a work" (Carroll, 2000, as cited in Taghvaee, 2015). Everything in the world has a structure, so it can be said that, basically, without the presence of a structure with desirable characteristics, a beautiful phenomenon cannot emerge and manifest. This issue can also be raised in architectural design because a beautiful building needs a desirable structure more than anything else to ensure its stability. Generally, a structure plays two influential roles in architecture: 1) bearing and transferring loads as the supporting skeleton of the building; 2) functioning as a statue. Therefore, the goal of structural design is to create forms that, in addition to meeting practical and environmental needs, also meet the desired criteria for the building's architectural design. Therefore, it must be acknowledged that an important part of architecture, and an influence on the beauty of a building, is considering the structure and its constituent elements, such as the type of space covering, foundations, slabs, columns, and ceilings (Taghizadeh, 2008).

Accordingly, the role of the structure in designing and shaping the architectural form and its beauty is a very important issue. Because the structure brings visual appeal and character to the building. However, given the role of structure in the beauty of a building, it has been viewed less as an aesthetic issue in contemporary Iranian architecture, making it important to pay attention to the structure's beauty and its impact on architecture. Before the contemporary period, buildings were mainly the result of the unity and coordination between architecture and the building system; each was viewed as a whole, and, in some cases, they resulted from the use of a load-bearing framework for the architectural space (Zarkesh, 2008). However, in the contemporary period, the unity of architecture and structure has diminished for various reasons: components are separated and distanced from one another, and their alignment is lost. This neglect is evident even when looking at the past and traditional architecture of Iran, where structure has played a key role in the beauty of the building. In fact, the presence of structural forms, such as the dome, arch, and porch, is evidence of this. Currently, many professionals and architecture graduates, due to a lack of knowledge about structure, are unable to create mental models and consequently use them in their designs. They are also unable to communicate effectively with other specialists, especially structural engineers, resulting in unsightly spaces. Therefore, a complete and

accurate understanding of the principles and concepts of structure in architectural design is necessary to correctly combine the concepts of structure with architectural design criteria to consciously understand the structure in every architectural design (Salvadori, 2003), and coordination between architectural design and structure is achieved with awareness of the behavior of structures (Moore, 2014). In other words, it can be inferred that one of the main factors contributing to illegibility and instability in spaces related to contemporary architecture is the separation between the concepts of architecture and building engineering sciences, especially structural engineering (Eslami & Hadafi, 2011).

Significance of the Research

The concept of aesthetics in architecture has often focused on its form and philosophical aspects, seeking to answer which formal aesthetics is suitable for artists (architects). In this context, the concept of beauty emphasizes identity as rules derived from the history of the individual, society, and the artist. Therefore, in general, in discussions related to aesthetics and architecture, analyzing the nature of beauty, the reason for beauty, and recognizing instances of beauty, etc., with an emphasis on identity-building elements in architectural form, have been considered (Mansouri, 2018). This emphasis on the aesthetics of form is important. At the same time, the aesthetic study of structure as another key element in the formation of architecture is a topic that has been less addressed in the body of research on aesthetics and architectural studies. This is because, as mentioned earlier, today the lack of attention to the concept of structure and its aesthetics is one of the factors contributing to the formation of ugly architecture. Basically, structural systems have the potential to enrich the vocabulary of aesthetics and give a building a visual character (identity). On the other hand, today, with the advancement of technology and the creation of new structural systems to achieve functions and the possibility of implementing forms responsive to different functions, the aesthetic aspects of the structure and its impact on the beauty of the architectural space have become an important and prominent issue that cannot be ignored. This neglect is, unfortunately, quite evident in the Iranian architectural space, in the shadow of various design-related structural regulations. Considering this research gap, this study seeks to identify the laws governing structural aesthetics in architecture by analyzing the nature and rationale of structural beauty and its impact on prominent examples of contemporary Iranian architecture, as articulated by experts.

Research Objectives and Questions

As stated, this research aims to explain and present a theory on how structures influence the creation of beautiful architectural spaces by analyzing the opinions of experts in architecture and structural engineering. In this regard, this research intends to pursue the following goals in its research process:

Study the relationship between structure and architecture in contemporary Iranian public buildings from the first Pahlavi period to the present

Explain the objective and influential dimensions of structure in contemporary Iranian architecture from the first Pahlavi period to the present and how it interacts with the beauty of architecture.

In addition, the questions that the present research will try to answer in line with the research objectives are:

What relationship between structure and architecture in contemporary Iranian architecture can lead to the creation of beautiful architecture?

What aesthetic characteristics can be identified in relation to structures by examining contemporary Iranian architecture, and what architectural qualities have these characteristics led to?

What are the most important factors influencing the formation of architecture based on the aesthetic characteristics of structures in the contemporary period?

Research Background

References related to this research can be categorized into three general sections. In the first category, the importance of the interaction between structure and architecture, the roots and reasons for the differences between them, and the consequences of this process in Iranian architecture have generally been considered. In this regard, Hashemnejad & Soleimani (2007), in their study that reviewed examples from Iran and around the world, identified the separation of structure and architecture as a factor in reducing the spatial quality, sustainability, and beauty of buildings, and emphasized the need to review architectural education. Parvizi et al. (2016), in their study and analysis of 126 Pritzker Prize-winning works, show that the representation of structural elements in facades peaked during certain periods and then gradually decreased. Etesam et al. (2013), in their examination of three decades of Iranian cultural architecture, identify three trends (traditionalist, semanticist, globalized) and criticize the lack of coherent theorizing in the field. Maleki et al. (2024), in their research with a semiotic approach, introduce form as the most effective component in the identity of the architecture of the second Pahlavi Dynasty. Yazdani et al. (2023), in their research using the method of semantic differentiation, reveal the gap between the tectonics of space and physical form in contemporary cultural buildings. Finally, Mirmasoumi (2025), in a review of 6000 years of Iranian architecture, emphasizes the inseparability of structure and architecture in historical monuments and identifies arching and dome-building as authentic Iranian innovations.

In the second category, they discuss the beauty of the structure and the effective methods for integrating a structure-oriented perspective in the architectural design process. Therefore, Kulasuriya (2005) states that the aesthetics of the structure depends on factors such as ideas, styles, theories, and technical considerations rooted in philosophy, and that its understanding requires looking beyond the body. Weber & Sigrist (2009), presenting the concept of "engineering aesthetics"1, described it as a historical construction and as a dynamic phenomenon that emphasizes the display of the flow of forces and the adequacy of materials, and noted that it has always been evolving. Donici (2014) concludes from his research that the neglect of structural aesthetics by engineers and by architects leads to a contradiction between the ideas of architecture and structure. In their research, Rastjoo et al. (2014) examined the aesthetic value of three-center arches with a structural visual approach. In the same year, Sendi (2014) also showed the role of digital technology and parametric design in combining the beauty and environmental performance of facades. Reitherman (2015), in his research, emphasizes the principle of beauty among Vitruvius's three principles and provides solutions for structural engineers to create efficient, economical, and beautiful structures. Reuben Peters & Victor (2016) explain, through a case study of Santiago Calatrava's works, that emphasizing structure as a design element, combined with modern materials and rhythmic forms, creates rich and inspiring visual works. Yu (2016) explains that every piece of architecture is a combination of technical skill and art, shaped by the simplicity of science and aesthetic principles, and demonstrates the integration of structure, from mechanics to aesthetics, in his research. Explaining that architectural movements are defined in relation to human interaction, but behind the scenes, there is a relationship between the fields of engineering and architecture, Chordia (2018) concludes that indifference to structure reduces aesthetics to false layers of covering, and a return to structural purity is necessary to respond to environmental concerns and innovation. Nejati et al. (2018) analyze 50 successful buildings, identifying functional, structural, and aesthetic components and introducing the paths of nature, technology, intuition, and the constructive architect. Sadeqi et al. (2019) also demonstrate the harmony of form with the catenary curve, compressive stresses, and the golden ratio as principles of structural aesthetics through numerical simulations of the dome of Taj al-Mulk.

Hassanisaleh et al. (2021), in their research using the combined DEMATEL and FANP method, identify materials as the most influential and shape as the most influential criterion in the beauty of monument form. Nejati et al. (2022) present a conceptual model with 5 criteria and 14 sub-criteria to link the aesthetics of form and structural design. Dixit & Stefańska (2023) state that naturalism and inspiration from biology should be used in the interdisciplinary, holistic design of the building to strengthen the structure's aesthetic role. In his research, which examines contemporary examples, Baghaee (2009) proposes that the structure's ability in symbolism and visual expression constitutes an independent aesthetic element. Shahidi (2010) introduces three formal, constructivist, and evolutionist approaches, introducing nature as a source of inspiration for efficient and beautiful structures. Hejazi & Mehdizadeh (2014) study Islamic architecture and present an algorithm for harmonious design based on geometric proportions and structural behavior. Alemi et al. (2016) explain the role of bending force in the formation of structural form by emphasizing internal and external forces. Ganjali Benjar & Behnamvala (2022) analyze the works of Calatrava and consider biomechanics and advanced technology as means of creating dynamic, harmonious structures in keeping with nature. Nejad Ebrahimi et al. (2025) also show the evolution of style from structural solutions to a combination with architectural space in their article on the Soltaniyeh Dome. Finally, Karimi Kheirabadi et al. (2025) explain technological aesthetics through the characteristics of movement, dynamism, and flexibility in contemporary architecture.

In the third category, there has generally been an attempt to discuss a set of features that facilitate the interaction between structure and architecture, as well as the consequences of this interaction (Table 1). In this regard, Alaghmandan et al. (2014) analyzed 73 tall buildings. They introduced curved forms and the diagrid system as the dominant approaches of the future. They considered the reduction of the base anchorage by up to 25% as one of the consequences of the harmony of form and structure. In his article, Farshchi (2015) introduced geometry as a body of knowledge with quantitative and qualitative aspects, as an intermediary between architecture and structure, and analyzed historical examples. In their study, Azizi & Torabi (2015) reviewed developments and showed that, in single-architecture cases, the structure itself creates the architectural space and gives it an identity. In his research, Zarkesh (2005) presented an educational model for the harmony of space and structure, emphasizing comprehensive education, cooperation between the architect and engineer, and a holistic approach. In his research, Taghizadeh (2008) introduced functional design as a solution for effective interaction between structure and architecture and emphasized the importance of close collaboration in the design process. In their research, Tayefe et al. (2015) developed a form analysis system based on Wayne Attoe's criticism, in which the structural part of the form serves as a prerequisite for correct architectural criticism. In the same year, Mardomi et al. (2015) presented a computational method for the optimal placement of supports in free forms using genetic algorithms, which simultaneously optimizes aesthetics (based on the Iranian knot) and structural performance. Hojat et al. (2019) identified three categories of structures (self-presenting, harmonious, forgotten) by presenting qualitative criteria. They introduced the Freedom Tower as a successful example of interaction between structure and architecture. Zendehdelan et al. (2019) present a flexible structure with a diamond origami pattern that is resistant along one axis and variable along the other. In their research, Afshari et al. (2020) identify the greatest presence of the structural dimension in Iranian architecture in the buildings of the second Pahlavi period, adopting a tectonic approach, and introduce the Museum of Contemporary Arts as the most complete example. Bakhshi Balkanloo et al. (2020) introduce bionic architecture as a creative tool for sustainability and improving the physical quality of space in developing countries. In their research, Azizi et al. (2024) analyze 41 religious buildings in

Table 1. Strategies and consequences of the aesthetic interaction of structure and architecture. Source: Authors.

References list	Proposed strategies and outcomes
Zarkesh (2005)	Interaction between architect and engineer and holistic approach
Taghizadeh (2008)	Integration of structural form and function
Tayefe et al. (2015)	Geometry, array, structure
Mardomi et al. (2015)	Geometry
Hojat et al. (2019)	Participation of form in higher efficiency of the structure, honesty in expressing structural elements, understanding the behavior of the structure in the form, the fit of the structure with the functional and semantic needs of the form, and the fit of the form with the needs of the construction of the structure
Zendehdelan et al. (2019)	Flexibility
Afshari et al. (2020)	Geometry, participation in spatial organization and instilling visual sustainability
Bakhshi Balkanloo et al. (2020)	Effective sustainability and improving the physical quality of the space
Azizi et al. (2024)	Recognition of the type of materials and their requirements
Ghorbanzadeh & Golabchi (2023)	Intelligence, safety, flexibility, strength and balance, optimality, attention to details, space definition, inspiration from nature, attention to post-operation needs, unity, combination with the context, force cutting and optimal form, geometry, proportions with scale, message, beauty, compatibility and sustainability
Eskandari et al. (2018)	Geometry and proportions
Zeinali et al. (2025)	Geometry
Alaghmandan et al. (2014)	Coordination of architectural form and structural system (curved forms, diagrid system)
Farshchi (2015)	Geometry
Azizi & Torabi (2015)	Triple levels: structure, container, covering

Mashhad and identify the combined pattern of walls and arches as dominant in the Safavid period. In the same year, Ghorbanzadeh & Golabchi (2023) also formulate the theory of constructible architecture, with physical, functional, and semantic dimensions, using data-based theorizing. Eskandari et al. (2018) analyzed geometry as a common language of structure and architecture in the Azadi Tower and the Soltaniyeh Dome and introduced it as a unifying factor. Finally, Zeinali et al. (2025) similarly introduced the geometric understanding of the structure as conceptual knowledge and an intermediary link between structural understanding and architectural design, which can be effective in applying structural knowledge in the architectural design process.

Theoretical Foundations

• Aesthetics

Aesthetics is the equivalent of the word "Aesthetics" in English, which comes from the Greek word Esthetique, meaning sensory perception or tangible thing (Ahmadi, 1999). Aesthetics, meaning knowledge obtained through the senses and sensory knowledge, was first used by Alexander Baumgarten in the 18th century, and later he used this word to refer to the perception of beauty with the help of human senses in interaction with phenomena that arouse the senses, especially in art (Aslani et al., 2025). Kant (1998) then added a new dimension to it by using this word in the two fields of art and nature; in defining beauty, he presented it as a phenomenon that universally produces pleasure and as an aimless end, regardless of interest or profit. Subsequently, this concept has a broader scope, so that this term is now used not only to describe judgments or evaluations but also to describe characteristics, attitudes, experiences, and pleasures or values (Moosavian et al., 2022). In fact, aesthetics is a philosophical system and perspective that discusses the meaning and definition of beauty, the origin and how different ideas and affirmations about beauty arise, whether it is subjective or objective, the philosophy of beauty, and the role of human cognition of beauty in relation to art and other human achievements (Parsons, 2010). Currently, aesthetics is generally divided into two main parts: 1) recognizing and understanding the factors that influence the

perception of an object or an experimental process as beautiful or pleasant, and 2) understanding the human ability to create effects considered aesthetically pleasing (Lang, 2002). Aesthetics usually occurs at three levels of perception. At the first level, beauty is perceived as it is based on balance and harmony; at the second level, beauty is perceived directly through the formation of a schema in connection with complex messages; and at the third level, beauty occurs in the brain without reference to consciousness in response to external stimulation (Pelowski et al., 2017) (Fig. 1). Aesthetics includes various dimensions that can be classified into three categories (Fig. 2). In the first category, aesthetics is divided into two dimensions: "practical" and "theoretical" (Laner, 2015). Practical aesthetics generally discusses various forms of art and their criticism. In the theoretical dimension, artistic compositions, human emotions, and inspiration from the beauty of creatures are the subjects of discussion. In another category, aesthetics has two dimensions: "natural" and "artistic"; in the natural dimension, beauty in nature such as mountains, plains, etc. is considered, while in the artistic dimension, beauty created by man and born of his imagination that does not exist in nature is discussed (Kant, 1998). In the third category, aesthetics includes the "sensory", "formal" and "symbolic" dimensions. In the sensory dimension, beauty is the result of enjoyment by the human senses, such as touch, smell, hearing, and sight. In the formal dimension, attention is paid to the shapes' form, and in the symbolic context, perception is derived from the meanings of the aspect under discussion (Nasar, 1988).

- **Architectural aesthetics and its types**

The topic of aesthetics in architecture or art in general has its roots in different cultures and nations and is influenced by theoretical wisdom, tastes, ideals, beliefs, and belief systems, and manifests itself in specific ways, displaying the identity structure and ethnic and national characteristics. However, architectural aesthetics is generally influenced by the third category of aesthetic dimensions mentioned in the previous section, namely formal beauty (figurative), iconic beauty (symbolic), and sensory beauty (Fig. 3).

Formal aesthetics in architecture deals with the visual structure of the environment, that is, visual features and qualities combined with the geometry of the environment. Its main subject is understanding the beauty of the values of the environment's shapes and structures, patterns, proportions, and ... the pleasure resulting from their perception through the visual and auditory senses (Lilian et al., 2009). In fact, this type of aesthetics is a topic that is considered in the theory of Gestalt psychologists and expresses a structured organizational form that cannot be considered as a set of elements placed together, because it has a different quality from its constituent elements and a change in one of its elements is enough to change the overall form (Lang, 2002, 215). In symbolic aesthetics, in architecture, it pays attention to the beauty and pleasure that emerge from the mental background of people or their mentality from shapes, structures, and environmental characteristics, and based on that, architecture and the environment are a system of symbols that give real form to concepts, values and meanings and make them tangible and understandable for humans (Afhami & Alizadeh, 2012). It is clear that in this aesthetics, symbolic quality is the most important factor in the perception of beauty, and this beauty has an internal and inherent connection with formal beauty (Lang, 2002, 191). Sensory aesthetics in architecture also deals with the feelings received by humans in relation to the environment and architecture, such as happiness, fear, sadness, excitement, etc., which are an important part of the individual's response when faced with the environment and architecture. In addition to these cases, another category of aesthetics called geometric aesthetics in architecture can also be seen in the body of research, which can be classified as formal aesthetics and perhaps symbolic aesthetics, because some geometric patterns have concepts and meanings among different nations and are rooted in culture and civilization (ibid.).

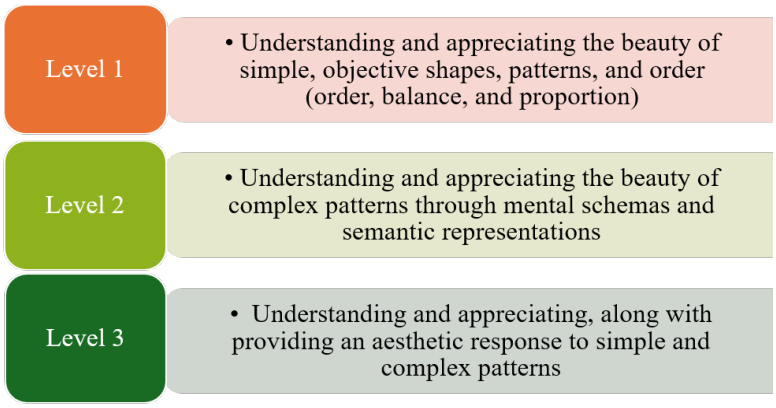

Fig. 1. Different levels of aesthetic understanding. Source: Authors.

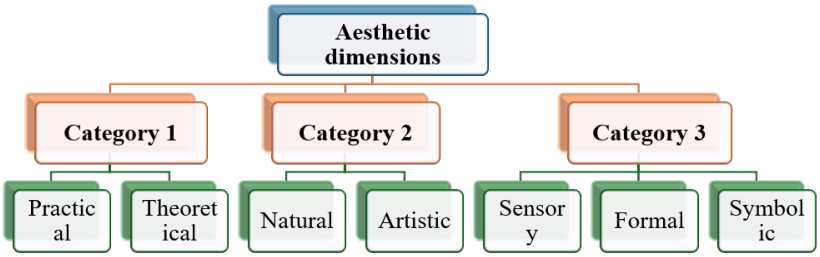

Fig. 2. Dimensions of aesthetics. Source: Authors.

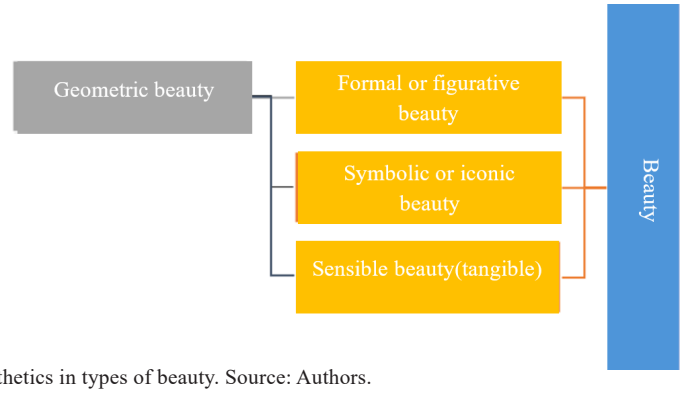

Fig. 3. The place of geometric aesthetics in types of beauty. Source: Authors.

• From the integrity of the structure and architecture to its beauty

Structure is a complex and multidimensional concept. Theorists such as Saussure, Jean Piaget, and Lévi-Strauss, in the school of structuralism and in contrast to the school of the originality of existence, have paid attention not only to objective concepts but also to subjective concepts. The structure is actually the nature that creates the totality of a phenomenon and preserves its existence. The phenomenon of architecture is a system through which the existing structure can be examined. In fact, architecture is a structured phenomenon embodied in the two components of "space" and "structure". Structure is a fundamental component of architecture, giving life to space and preserving its wholeness by creating different forms and, sometimes, by supporting functions. By examining different types of architecture, it can be stated that the relationship between the structure and the space takes place in four ways: 1) The structure as the holder of the form and the transfer of forces to the ground, 2) The structure as a component of defining the space, 3) The structure as a functional system, and 4) The structure as form and space; Obviously, this is a credit

division and the relationship between the structure and the architectural space is a combination of these things. According to what was said, the structure in interaction with space has two components, form and function; however, it can be expected that the interaction of structure and space, like any other objective phenomenon, also includes the meaning component. In such a view, the structure, by using its different qualities in relation to space, can create various architectural concepts and mental meanings by shaping the architectural space and humans' relationship with the surrounding environment. Therefore, it can be said that the structure works by creating static forms, establishing order and geometry, supporting functions, serving as a symbol and sign, and finally creating meaning for the audience, seeking to form meaning between the audience and the architectural space. In fact, the structure can affect meanings and themes through its use of space and by creating a "mental image". Based on this, the beauty of the structure in the architectural space can be manifested in an interactive and triple connection with form, function, and meaning (Felahat & Kalami, 2007) (Fig. 4). In general, the beauty of any phenomenon is affected by the three mentioned components, i.e., form, function, and meaning. Form is a component that reveals the shape, structure, volume, etc. of any phenomenon; Function refers to the use that humans have of a phenomenon, and the meaning component appears in two general categories depending on the text (cultural background and context) and the audience's mind (Afhami & Alizadeh, 2012, 58). Therefore, to identify the beauty of the structure, it should be examined in relation to the mentioned three components, in other words, to identify the aesthetic characteristics resulting from the structure and affecting the architecture, the structure should be studied through the lens of three lenses, form, function and meaning, and it was expected that these three components would be the generator of aesthetic characteristics that can be analyzed and classified in the structure of architectural aesthetics, i.e. formal, symbolic and tangible aesthetics.

Research Method

This research is qualitative in nature and applied in purpose. The method used in this research is grounded theory, a qualitative approach employed within a mixed-methods strategy. Grounded theory is an inductive and exploratory research method that allows researchers in various subject areas to develop their own theory instead of relying on existing theories, especially when the research literature on the subject is not sufficiently rich; a new theory also pursues this goal through an inductive process that has not been proposed in research communities. This theory is not developed before the research but is developed entirely during the research process. This

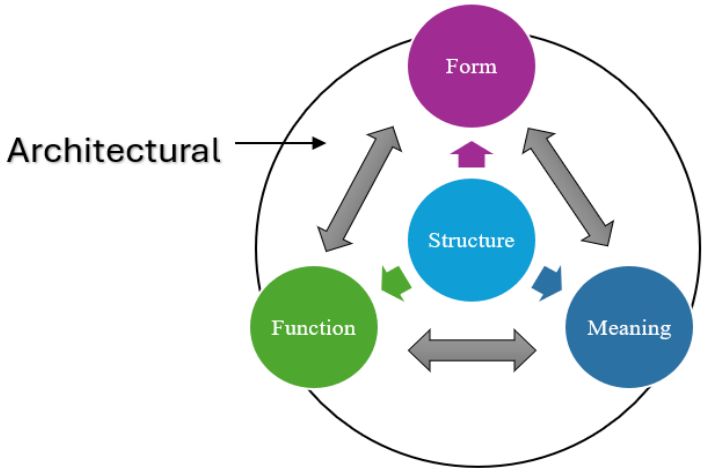

Fig. 4. Model of the position of a structure in architecture. Source: Authors.

method was introduced by two sociologists, Barney Glaser and Anselm Strauss, in 1967. The main method of data collection was to conduct various types of interviews with the research population. Next, the data analysis process involved coding the interview text, and then a theory was developed from the data to explain processes, actions, and interactions at a broad level. Today, three dominant approaches in grounded theory can be distinguished: 1) Systematic approach (Strauss & Corbin, 2008); 2) Emergent approach (Glaser); 3) Constructivist approach (Charmaz). However, the present study will be based on the Strauss & Corbin (ibid.) method. In this method, after collecting data, the data are coded in three stages: 1- Open coding, 2- Axial coding, and 3- Selective coding, until the research theory is finally completed through the paradigm pattern in the model. The paradigmatic model in grounded theory research includes the following: causal conditions, background conditions, intervening conditions, strategies, and consequences, all organized around the phenomenon under study (ibid.).

To conduct this research, after preparing the questions, a statistical population of 20 experts in the field of architecture and structures was selected through purposive sampling for interviews. Given the emphasis of this research on the subject of structures in architecture, 15 people from the statistical population of interviewees were selected from among university professors and professional experts with direct experience in the field of construction, representing a diverse range of scientific fields such as architectural engineering, architectural technology, restoration, and Islamic architecture. Also, to obtain the opinions of structural designers, 5 experts in this field with experience in architectural projects were selected for the interview. After determining the statistical population, the intended questions were formulated to address the research questions. These questions were generally placed under nine main headings: typology of beauty in architecture, criteria of architectural aesthetics, role of user and structure in beauty, form of structure versus beauty, function of structure versus beauty, comparison of beauty in contemporary buildings with traditional buildings, effects of technology, and role of architect and structural engineer in beauty.

After conducting interviews as part of the research process and obtaining people's opinions on the interview questions, these opinions were entered into Atlas.ti software after preparation and sorting. This software provides researchers with a wide range of analytical tools for qualitative data, especially in grounded theory research. After entering the initial data, the interview texts were coded in an open and bottom-up manner. In the bottom-up coding method2, unlike the top-down coding method3, which uses predetermined codes, the coding process is carried out based on the words used in the data itself (Tobi & Van den Brink, 2017). In other words, the coding process and data analysis are created simultaneously with the study and rereading of the research statements and data. At this stage, after coding, 121 initial codes were created for the statements. Given the large number and the overlap among some of the codes, the created codes were examined. After removing and modifying some items, the open codes were reduced to 45 in an aggregation process. In the next step, due to the abundance of codes, the initial coding was converted into secondary codes, and similar codes were grouped into one category, reducing the number of codes to 18 main and conceptual codes. Next, the conceptual codes were categorized based on three components affecting the beauty of the structure in architecture, namely formal, semantic, and functional beauty, to determine how each code affects the beauty of the structure in architectural form. Then, to examine the validity in relation to the interviews and expert opinions, the formal method was used. For this purpose, codes derived from the opinions and interviews of experts in the research field were provided to 5 professors and 5 experts in architecture and structural engineering, and their proposed opinions were included in the interview. In each subsequent stage, these 18 codes were coded using axial coding. In the axial

coding stage, the codes generated after establishing a communication process, conceptual links, and semantic categories were categorized to create order and coherence. Finally, after completing these steps, the initial paradigmatic model for the research was created through selective coding. At this stage, to examine the validity of the proposed model, it was presented to 5 experts in architecture and structural engineering. After obtaining and considering their opinions, a paradigmatic model aligned with the research theory was developed.

Findings

- **Initial open coding**

Open coding is part of the data analysis process that involves breaking down, comparing, naming, conceptualizing, and categorizing data. During open coding, the data is broken down into separate sections and examined to find similarities and differences. In the open coding phase, statements, interviews, and opinions of 20 architectural and structural experts were extracted and coded in a bottom-up manner. The results of this phase are shown in Table 2.

- **Secondary open coding**

In this stage, due to the abundance of primary codes and to reduce and organize the codes created in the previous stage, secondary coding was performed to categorize them by concepts common across several codes, as a result of which several primary codes were consolidated into a conceptual code. Also, at this stage, secondary codes were classified in relation to the formal, functional, and semantic components considered to shape the beauty of the structure. The result of this stage is shown in Table 3.

- **Axial coding**

In this stage, the main goal is to establish relationships among the categories generated in the open coding stage and to create a network of connections among them. This coding is called axial because the coding is carried out around a category. Therefore, in this stage, one of the categories is selected as the axial category, explored as the axial phenomenon at the center of the research process, and its relationships with other categories are examined and determined. The goal of this stage is to create order and coherence in the coded data, categorize, combine, and organize the large amount of data, and reassemble them in a new way. Accordingly, the statements and codes created in the previous stage were coded after identifying the key axes and classified according to the components of formal, functional, and semantic beauty. The results of this stage are given in Table 4.

- **Selective coding**

At this stage, and in line with the research question of "What relationship and aesthetic features does contemporary Iranian architecture represent in the interaction of structure with architecture that are capable of creating a beautiful architectural space?", selective coding was carried out based on the axial coding of the previous stage and on the components of the Strauss & Corbin (2008) paradigm model, which includes causal, contextual, intervening, phenomenon, strategies, and consequences conditions, which can be seen in the diagram (Fig. 5).

Discussion

The findings of this study, based on data analysis and the opinions of experts in the field of architecture and structural engineering, are noteworthy in that the use of new structures and materials such as steel and concrete has induced a sense of difference, distinction, and visual appeal among contemporary buildings compared to traditional buildings, which has led to the creation of beautiful and diverse forms, which can be examined and observed in addition to the facade of the building in the plans of the buildings under study. According to the paradigmatic model of this study, the creation of new and diverse functional patterns, along with the emergence of new spatial systems related to them, is the main reason for the formation and development of aesthetic patterns influenced by structure in contemporary buildings. In fact, the formation of new functions and the separation between them, on the one hand, and the need to create architecture specific to each of these functions in the contemporary era have led to the

Table 2. Results from initial open coding and after the cumulative process. Source: Authors.

Row	Statements	Code
1	Aesthetic criteria have led to the weakening of the role of the structure and increased simplicity.	Diminishing role of structure and simplicity
2	New technology and materials have made the structure and architecture in contemporary buildings simpler and freer.	Simpler and less complex buildings
3	In the contemporary era, the structure in the service of the building has led to formal and pure architecture.	Formal buildings with greater purity
4	The development of the structure by eliminating columns has caused simplicity and spatial continuity.	Simplicity and spatial continuity
5	Structural technology has brought more diversity and creativity to architecture.	More diversity, development and creativity
6	The development of structural technology and knowledge has caused a gap between architecture and structure.	Gap between architecture and structure
7	The form of architecture has a kind of disconnect from structural systems.	Disconnection between form and structural system
8	The development of structural systems has led to the gradual separation of structure and architecture in contemporary buildings.	Gradual separation of structure and architecture
9	The overall form of buildings and structures exhibits a kind of alignment toward independence from each other over time.	A kind of alignment to independence between architecture and structure
10	Compared with traditional buildings, contemporary architecture features greater spatial integration.	Greater spatial integration
11	The overall form of contemporary buildings and structures has led to the independence and integrity of architecture.	Independence and formal integrity
12	The structure and architecture are integrated in a way that cannot be separated in terms of form, shape, and texture.	No separation of form, shape, and texture
13	A clear boundary between architecture and structure cannot be drawn.	No clear boundary
14	Architecture has reached an intertwining with it, with a high understanding of the structure and complete recognition.	High intertwining and understanding of structure and architecture
15	The understandable connection resulting from more precise details has led to the interaction of the structure and architecture.	More precise details and interaction of structure and architecture
16	The use of design principles for form and stability is the current guiding principle in the interaction between structure and architecture.	Principles of form design and structural stability
17	The implementation of prefabricated and modern connections has increased quality and reduced construction time.	Reducing construction time and increasing quality
18	The process of introducing new materials and the transition from load-bearing structural systems to modern ones.	New materials and creating new systems
19	Structure and architecture represent greater integration and independence in later buildings.	Demonstrating independence and integrity
20	Structural development and the creation of different structural systems, such as shell structures, are evident.	Development of structural systems
21	Contemporary structural systems require specialized executive forces.	Workforce specialization
22	Structural systems have enabled the use of new materials and forms.	New materials and new forms
23	The development of structural systems in contemporary buildings has led to greater transparency and exposure.	Transparency and exposure
24	It has caused the shell and free visual identity of the building to be present in contemporary buildings and to interact with the environment.	Free visual identity and interaction with the environment
25	It has created a transparent, fluid architecture and communication between the inside and the outside.	Transparency of inside-outside communication
26	It has led to the use of geometric principles in the design of the structure's openings and influenced architecture.	Geometric principles in the design of openings
27	It has led to the development of architecture that conforms to rhythm and symmetry, in accordance with the load-bearing building system.	Rhythm and symmetry in accordance with the building system
28	It has led to the development of effective new standards, criteria, scales, and design principles.	Standards, criteria and scale

Rest of Table 2.

Row	Statements	Code
29	The use of modulation, order (legibility), and grid proportions in architectural design has led to the prominence of the opening cover, the order of the opening network, the height of floors, and access.	Module, legibility and proportions
30	Contemporary structural systems require specialized executive forces.	The importance of finding openings, height, and accessibility
31	The use of new materials in the structure has given the building a different and attractive feel.	The importance of span, height and access
32	Creating a building plan and facade influenced by the structure has led to greater architectural beauty.	New materials and the creation of new sensory qualities
33	Structural development is a tool for displaying transparency and technology in contemporary architecture.	Creating plans and facades with greater beauty
34	In contemporary architecture, the structure is an element that gives identity and narrates design ideas.	Showing transparency and technology
35	Technological and structural developments have introduced formal and spatial flexibility in architecture.	Identity and narrative of ideas
36	Modern structures have created dynamic and flexible architecture.	More formal and spatial flexibility
37	Structural technology and architecture have transformed from a subordinate state to an expressive and participatory state.	Dynamic and flexible architecture
38	The overall form of the building and structure demonstrates simplicity and contemporary technology.	Showing an expressive and participatory situation
39	In the contemporary era, the interaction of the architect and the structural engineer has alternated from a weak to a strong relationship.	Showing the simplicity of technology
40	The relationship between the architect and the structural engineer varies from interaction to an insular function.	Alternating interaction between architect and structure
41	The complexity and fading of the architect's leadership roles in contemporary buildings have led to.	Interaction or acting as an island
42	The creation of a hierarchical, pyramidal system is evident in the roles of the architect and the structural engineer.	Diminishing the role of the architect as a leader
43	The development of technology and the emergence of more complex specialties have created a need for an integrated design process.	Hierarchy in relation to the role of the architect and the structure
44	The evolution of structural patterns and the emergence of new functions have led to the development of distinctive spatial systems in contemporary architecture.	Specialization in design and the need for integration of the design process
45	The development of new structural patterns and the formation of new architectural styles have led to greater responsiveness to functions.	Structural transformation and new functions and a new spatial system

creation of new spatial systems, which in turn have led to the formation and development of new and beautiful architecture based on structural features in contemporary buildings. On the other hand, based on the findings of this study, architecture formed in connection with structural systems in the contemporary era can be designed around a set of principles or strategies. One of the principles identified in this study is purity, evident in many of the buildings examined. Purity or simplicity emphasizes the principle that, in the contemporary era, when employing new structural technologies and systems in the design process, pure forms and simple, continuous, and uncomplicated spatial systems have been considered. Another strategy is to pay attention to the principle of integration. Based on this principle, the overall form of the building and structure should be designed to achieve architectural integration, so that the boundary between architecture and structure is not clear. The architecture, with a deep understanding and complete knowledge of the structure, has reached a state of intertwining and unity with it. As a result, the form, shape, and texture of architecture and structure are inseparable. In addition, geometric principles are considered a strategy in the design process. This principle also emphasizes that the use of geometry for the purpose of designing a structure, especially in cases such as dimensions and shape patterns of openings and the ratios between them, etc., is something that can affect its architecture, forms,

Table 3. Results of secondary open coding. Source: Authors.

Row	Components	Secondary open codes	Density	Corresponding statements	Open codes
1	Form components	Purity	4	Aesthetic criteria have led to the weakening of the role of the structure and increased simplicity.	Diminishing role of structure and simplicity
2				New technologies and materials have made the structure and architecture of contemporary buildings simpler and freer.	Simpler and less complex buildings
3				In the contemporary era, the structure in the service of the building has led to formal and pure architecture.	Formal buildings with greater purity
4				The development of the structure by eliminating columns has caused simplicity and spatial continuity.	Simplicity and spatial continuity
5		Development and diversity	1	Structural technology has brought more diversity and creativity to architecture.	More diversity, development and creativity
6		Disconnection and gap	4	The development of structural technology and knowledge has caused a gap between architecture and structure.	Gap between architecture and structure
7				The form of architecture has a kind of disconnect from structural systems.	Disconnection between form and structural system
8				The development of structural systems has led to the gradual separation of structure and architecture in contemporary buildings.	Gradual separation of structure and architecture
9				The overall form of buildings and structures exhibits a kind of alignment toward independence from each other over time.	A kind of alignment to independence between architecture and structure
10		Integration	6	Compared with traditional buildings, contemporary architecture features greater spatial integration.	Greater spatial integration
11				The overall form of contemporary buildings and structures has led to the independence and integrity of architecture.	Independence and formal integrity
12				The structure and architecture are integrated in a way that cannot be separated in terms of form, shape, and texture.	No separation of form, shape, and texture
13				A clear boundary between architecture and structure cannot be drawn.	No clear boundary
14				Architecture has reached an intertwining with it, with a high understanding of the structure and complete recognition.	High intertwining and understanding of structure and architecture
15				The understandable connection resulting from more precise details has led to the interaction of the structure and architecture.	More precise details and interaction of structure and architecture
16		Interaction	2	The use of design principles for form and stability is the current guiding principle in the interaction between structure and architecture.	Principles of form design and structural stability
17				The implementation of prefabricated and modern connections has increased quality and reduced construction time.	Reducing construction time and increasing quality
18		Implementation	5	The process of introducing new materials and the transition from load-bearing structural systems to modern ones.	New materials and creating new systems
19				Structure and architecture represent greater integration and independence in later buildings.	Demonstrating independence and integrity
20				Structural development and the creation of different structural systems, such as shell structures, are evident.	Development of structural systems
21				Contemporary structural systems require specialized executive forces.	Workforce specialization
22				Structural systems have enabled the use of new materials and forms.	New materials and new forms
23		Extroversion	3	The development of structural systems in contemporary buildings has led to greater transparency and exposure.	Transparency and exposure
24				It has caused the building's shell and free visual identity to be present in contemporary buildings and to interact with the environment.	Free visual identity and interaction with the environment

Rest of Table 3.

Row	Components	Secondary open codes	Density	Corresponding statements	Open codes
25	Form components	Extroversion	3	It has created a transparent, fluid architecture and communication between the inside and the outside.	Transparency of inside-outside communication
26	Common form-meaning components[1]	Geometry	1	It has led to the use of geometric principles in the design of the structure's opening and influenced architecture.	Geometric principles in the design of openings
27		Rhythm and symmetry	1	It has led to the development of architecture that conforms to rhythm and symmetry, in accordance with the load-bearing building system.	Rhythm and symmetry in accordance with the building system
28		Order and proportions	3	It has led to the development of effective new standards, criteria, scales, and design principles.	Standards, criteria, and scale
29				The use of modulation, order (legibility), and grid proportions in architectural design has led to the prominence of the opening cover, the order of the opening network, floor heights, and access.	Module, legibility and proportions
30				Contemporary structural systems require specialized executive forces.	The importance of finding openings, height, and accessibility
31		Beauty and specificity	2	The use of new materials in the structure has given the building a different and attractive feel.	The importance of span, height, and access
32				Creating a building plan and facade influenced by the structure has led to greater architectural beauty.	New materials and the creation of new sensory qualities
33		Transparency	1	Structural development is a tool for displaying transparency and technology in contemporary architecture.	Creating plans and facades with greater beauty
34	Semantic components	Identity and narrative	1	In contemporary architecture, the structure is an element that gives identity and narrates design ideas.	Showing transparency and technology
35		Flexibility	2	Technological and structural developments have introduced formal and spatial flexibility in architecture.	Identity and narrative of ideas
36				Modern structures have created dynamic and flexible architecture.	More formal and spatial flexibility
37		Simplicity and expression	2	Structural technology and architecture have transformed from a subordinate state to an expressive and participatory state.	Dynamic and flexible architecture
38				The overall form of the building and structure demonstrates simplicity and the use of contemporary technology.	Showing an expressive and participatory situation
39		Interests and conflict	5	In the contemporary era, the interaction of the architect and the structural engineer has alternated from a weak to a strong relationship.	Showing the simplicity of technology
40				The relationship between the architect and the structural engineer varies from interaction to an insular function.	Alternating interaction between architect and structure
41				The complexity and fading of the architect's leadership roles in contemporary buildings have led to.	Interaction or acting as an island
42				The creation of a hierarchical, pyramidal system is evident in the roles of the architect and the structural engineer.	Diminishing the role of the architect as a leader
43				The development of technology and the emergence of more complex specialties have created a need for an integrated design process.	Hierarchy in relation to the role of the architect and the structure
44	Common form-functional components[2]	Space system	1	The evolution of structural patterns and the emergence of new functions have led to the development of distinctive spatial systems in contemporary architecture.	Specialization in design and the need for integration of the design process
45	Functional components	Performance	1	The development of new structural patterns and the formation of new architectural styles have led to greater responsiveness to functions.	Structural transformation and new functions and a new spatial system

Table 4. Results of axial coding. Source: Authors.

Axial coding	Open coding	
Axes (categories)	**Secondary codes (concepts)**	**Primary codes**
Central phenomenon	Beauty and uniqueness	- New materials and creation of new sensory qualities - Creation of more beautiful plans and facades
Causal conditions	Spatial system	- Structural evolution and new functions and new spatial systems
	Function	- Modern architecture and greater responsiveness to functions
Contextual conditions	Implementation	- Reduction of construction time and increase in quality - Creation of new materials and creation of new systems - Development of structural systems - Specialization of the workforce - New materials and new forms
	Development and diversity	- More diversity, development and creativity
Intervening conditions	Interests and aggression	- Intermittent interaction between architect and structure - Interaction or insularity - Diminishing of the role of the architect's leadership - Hierarchy in relation to the role of the architect and structure - Specialization in design and the need for integration of the design process
	Disconnection and gap	- Gap between architecture and structure - Lack of connection between form and structural system - Gradual separation of structure and architecture - A kind of alignment toward independence between architecture and structure - Demonstration of independence and integration
Strategies	Purity	- Diminishing the role of structure and simplicity - Simpler and less complex buildings - Formal buildings with greater purity - Simplicity and spatial continuity
	Integrity	- Greater spatial integration - Independence and formal integrity - No separation of form, shape, and texture - No clear boundary - High intertwining and understanding of structure and architecture - Demonstration of independence and integrity
	Geometry	- Geometric principles in the design of openings
	Rhythm and symmetry	- Development of architecture in accordance with rhythm and symmetry in accordance with the load-bearing building system.
	Order and proportions	- Standards, criteria and scale - Module, legibility and proportions - Finding the importance of openings, height and accessibility
Consequences	Simplicity and expression	- Showing the expressive and participatory situation - Showing simplicity and technology
	Flexibility	- More formal and spatial flexibility - Modern structures have created dynamic and flexible architecture
	Identity and narrative	- Identity and narrative of ideas
	Transparency	- Showing transparency and technology
	Extroversion	- Development of structural systems - Free visual identity and interaction with the environment - Transparency of the inside and outside connection
	Interaction	- More precise details and interaction of the structure and architecture - Principles of design of form and structural stability

and spatial relationships. In addition, rhythm and symmetry are other principles that the model of this research refers to. In fact, the structural system and its constituent elements exhibit rhythm and symmetry, creating stability and facilitating the flow of forces. These features, in accordance with the building's architecture, affect its form and spatial relationships. Finally, the use of order and proportions in the design process, utilizing a set of standards, criteria, and spatial scales, along with the use of modulation and

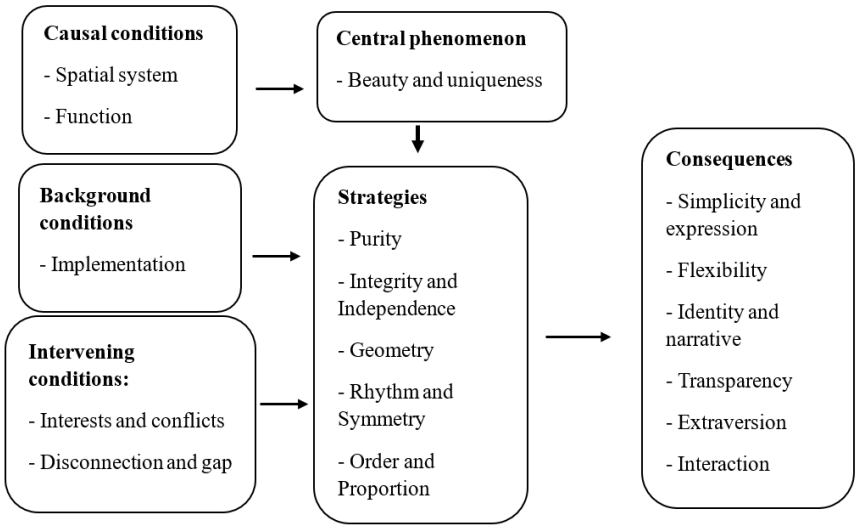

Fig. 5. Paradigmatic model of research based on selective coding. Source: Authors.

grid proportions based on the structural system, span coverage, floor height, and circulation, to increase architectural legibility, is another principle that can be considered effective in relation to the structural system of the building.

According to the paradigmatic model, the proposed strategies have had consequences. As a result of these consequences, the building's structure, through its interaction with architecture, is the current principle in the building's formal and static design and reflects the mutual relationship evident in the precise details of these two components. In addition to providing the building's static stability, it also serves as an identifying element and a narrator of the designer's creative ideas. In addition, the structure, by going beyond its usual role in transferring forces and providing the stability of the building, acts as a tool and medium that represents the technology of the modern era, its simplicity and transparency in the present era. Another consequence of these conditions is the emergence of architecture with greater flexibility in form and space, making it more dynamic than in previous periods. This dynamism can be recognized in the formal, shape, and diversity games that arise from them, as well as in the combinations that emerge from spatial connections. As a result of this dynamic, architecture and structure move from a state of subordination to an expressive and participatory state, which also increases the extroversion of architecture through the exposure of its shell and its free-flowing visual identity, which has led to greater interaction between architecture and the surrounding environment and has led to the improvement of the connection between the inside and the outside.

However, the model proposed in this study has identified factors that can have facilitating or limiting effects on the emergence of architecture based on the beauty of the structure. Based on the paradigmatic model, issues related to the discussion of implementation can be considered as effective conditions or contextual factors. In fact, issues such as prefabrication and the need for modern structural connections and elements to increase construction quality and reduce construction time, along with the introduction and development of new structural systems such as structural shells and the complexity associated with their implementation by moving away from traditional systems, especially load-bearing walls, and the introduction of new materials, as well as the need for specialized personnel to implement these structures and the shortage of these personnel in some places, especially in remote areas due to distance and lack of access, are considered to be the most important background factors that can affect

the development of architecture based on structural aesthetics.

Along with these background conditions, there are also interventionist conditions that can be effective. One of these factors is the potential for interests and conflicts arising from the interaction between the structural engineer and the architect during the design and construction process. In fact, currently, due to the prevailing set of rules and guidelines related to architectural and structural design, construction processes, and the legal system governing the agencies involved in construction, especially the Ministry of Roads and Urban Development, the Management and Planning Organization, and the Building Engineering System Organization, the relationship between the structural engineer and the architect has been defined in a hierarchical and pyramidal system. In this system, the relationship between the architect and the structural engineer varies in a range from interaction to insular performance, which has caused that, in some cases, the interests and conflicts of the fields related to each of the specialists make it difficult to form architecture based on the interaction of the structural engineer and the architect. In addition, the development of construction-related knowledge and the emergence of more specialized roles over time have exacerbated the gap and lack of communication between the architect and the structural engineer in recent years. This situation, along with the gradual fading of the architect's role as a leader in the design and construction process, which was clearly evident in traditional buildings, is another factor that can negatively affect the integrated design process of architecture and structure.

Conclusions

In response to the first question of the article, the research findings showed that the integration and unity of the structure and architecture in the design and construction process, due to the formation of diverse functional ranges in the contemporary era and the needs related to their spatial systems, has led to the formation of buildings that, in addition to beauty, distinction and uniqueness, also meet the functional and spatial needs of their users. In response to the second question of this research, it should be stated that purity and simplicity, integrity and independence of the structure and architecture, the presence of geometry, rhythm and symmetry, as well as order and proportion are aesthetic characteristics resulting from the structure that can achieve architectural qualities such as simplicity and expressiveness, greater flexibility, identity and narrative, transparency, extroversion and interaction between the inside and the outside in buildings. It is important to note that, according to the model of beauty of structure identification in architecture (Fig. 4), these features are not limited to formal beauty features only, but can also be included in the category of semantic beauty features. In fact, based on the research findings in Table 4, the beauty resulting from the structure is debatable with respect to both formal and semantic components. In response to the third question, the most important factors affecting architecture based on the aesthetic features of the structure include background factors related to implementation issues such as prefabrication, complexities related to new structures and materials, and lack of access to specialized personnel; as well as intervention factors, the most important of which is the formation of interests and professional and specialized conflicts between people involved in the design and construction process on the one hand, and the formation of a hierarchical and pyramidal system among them on the other hand, which can occur as a result of the lack of mutual communication and interaction between specialists.

The findings of this study can also be considered in relation to the existing body of research. In line with the body of research, this study's results confirmed the principle that design emphasizing structure can lead to beautiful architecture. In addition, the study's findings, consistent with the body of research, showed that the lack of attention to the interaction and separation between the architect and the structural engineer in the design and construction process is a serious

reason for the failure to achieve ideal architecture in the contemporary era. This is while previous studies have pointed to the role of proper education and its lack in the academic system as another fundamental reason for the separation and differentiation between structural design and architecture. Also, qualities such as efficiency, simplicity, representation and visual power, flexibility, unity and compatibility with the context, and compatibility and sustainability are among the most important qualities of architecture, as they are grounded in the aesthetics of the structure and have been highlighted in the body of research. This study, while confirming and presenting some of them, also introduced other qualities, such as identity, transparency, extroversion, and interaction with the environment, as resulting from the aesthetics of the structure. On the other hand, among the research conducted, the integration of architecture and structure, adaptation to organic forms and naturalism, recognition of the type of materials and their requirements, and the use of geometry and scale have been considered as principles and strategies for achieving architecture that is consistent with the beauty of the structure. However, this research, while confirming these factors, also suggests paying attention to purity and simplicity, rhythm and symmetry, and order and proportion as strategies for creating beauty in both the formal and semantic components of architecture.

The most important limitation that this research faced in the data collection process was the lack of cooperation from some academic specialists in the interview process in order to obtain their views, so that despite the request for cooperation, many of these people were not willing to participate, as a result of which the researchers tried to introduce new people to the research process. This lack of cooperation is even though the essence of any research activity is participation among academic researchers. However, research perspectives that can be considered by other researchers in line with the results of this article and to expand and develop the literature related to the beauty of structures and its application in architecture include:

Using the paradigmatic model of this study in analytical studies of examples of contemporary Iranian architecture, in order to test and develop it.

Comparative study of contemporary architecture in Iran and other parts of the world based on the paradigmatic model of this study and identifying their differences and similarities.

Conducting research to provide a conceptual framework to facilitate communication between structural engineers and architects in the design and construction process.

Declaration of Conflicting Interests

The authors declare that there is no conflict of interest for them in conducting this research.

Endnotes

1. Common form-meaning components are components that, due to their characteristics, can be simultaneously and jointly classified into two categories: formal and semantic components.
2. Common form-function components are components that, due to their characteristics, can be simultaneously and jointly classified into two categories: formal and functional components.

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