Available online at www.ijapas.ir

International Journal of Applied Arts Studies

IJAPAS 8(4) (2023) 63–88

Screening of Physical and Aesthetic Components in Cultural Buildings of the Last 20 Years in Iran (Case Study: Tehran and Shiraz Cities)

Jamak Mirhadi[a], Mozayan Dehbashi Sharif[b]*, Darab Diba[c]

[a]*Department of Architecture, Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[b]*Department of Architecture, Central Tehran Branch, Islamic Azad University, Tehran, Iran*
[c]*Department of Architecture, Central Tehran Branch, Islamic Azad University, Tehran, Iran*

Received 19 July 2023; accepted 03 November 2023

Research Article

Abstract

Beauty as a physical matter has always been discussed and debated in various designs, and most interior and exterior designers seek to create a unique space from a different environment. This study was conducted to extract and categorize the aesthetics values in the cultural buildings of contemporary Iranian architecture based on fuzzy Delphi. For this purpose, the governing components in the aesthetics variables were extracted through document analysis and library studies of articles and books, and then a questionnaire was used to examine the contribution of each component. From the point of view of the space users, screening was done in the components of the relationship between form and structure in culturally significant buildings. The results indicate that in the environmental dimension, the highest degree of membership is related to the component of performance following the form, and the lowest is related to safety. In the decoration dimension, the highest degree of membership is related to visible details and the lowest degree of membership is related to the Connection method. In the formal dimension, the structure component is a structure and the least related to structural signs and symbols, and the least is related to spatial arrangement. In terms of signs and symbols, Platonic forms and least related to the way of using materials. In the coordination dimension, the balance component, and the lowest is related to resistance variable.

Keywords: Screening; Aesthetic; Physical Components; Cultural Buildings; Contemporary Iranian Architecture

* Corresponding author. Tel: +98-9126197016.
E-mail address: moz.dehbashisharif@iauctb.ac.ir

1. Introduction

The link between architectural form and structure has always existed in Iran's traditional architecture based on many evidences. In this regard, we can refer to buildings such as the tomb of Qaboos bin Ziyar, nicknamed Qaboos Dome in Gorgan, Isfahan Jame Mosque, and Soltanieh Dome. Special technologies are under construction. The evolution of the structure in Iranian architecture has been evolutionary. This interconnected course of history, which was accompanied by a huge support from the experiences of the past, is one of the reasons for the increasing progress of Iranian architects of that time in the field of construction techniques. Some architectural researchers (such as Mario Salvadori) have argued that Paying attention to the structure of the building will inevitably lead to beauty. Of course, it is not correct to say that beauty necessarily depends on the structure of the building, and it may be possible to show that some buildings look lovely with an incorrect structure, while some completely correct structures are not satisfactory from the point of view of beauty. Therefore, the proper expression of the structure is a necessary part of the building's beauty, but it alone is not enough for the building's beauty. In this way, it can be concluded that the knowledge of structure understanding is important as a part of integrated architecture and aesthetics, and the common link and mutual understanding of structure, architecture and beauty is a specialty that can only be obtained from a master architect and designer. It can also be said that balance, stability, performance and beauty are the factors that raise the discussion of beauty in the structure (Ahmadi, 1996: 17). The structure can be visible in the building or generally hidden among the architectural components, when the structure of the building is visible, the beauty of the structure becomes necessary. The beauty of the structure also follows the beauty of the architecture, and in such a situation, the structural system can act as a determining feature in architectural design.

The structure is one of the tools for the emergence of the architectural form, and nowadays most of the prominent buildings have prominent designers who are fully aware of the structural and construction issues and fully understand the behavior of the structural system. The aesthetic appeal of a building is a key concern in architecture and is usually considered a subjective/individual characteristic. However, some buildings are admired all over the world, but there are also buildings that are criticized. It is possible that there are certain features of the building form that made the buildings and structures attractive and beautiful in the eyes of the people. Architectural form refers to the visual characteristic of a building that gives it a unique identity and distinguishes it from other buildings. As the main perceptible feature, the architectural form is the main dimension in the aesthetic pleasure of a building. Therefore, aesthetics in architecture is constantly trying to arouse human feelings with the help of forms. In general, he intends to create something beautiful or present a kind of good architecture, which means good means that it completely solves all human needs and is aesthetically responsive (Engle, 1998: 14). Considering that architectural aesthetics, as a combination of both artistic and engineering technologies, has attracted more attention, it has been the most important priority of architects how to balance them to achieve real structural aesthetics, with the integration of technical and try artistically Since beauty has objective and subjective aspects, beauty in architecture can be examined in two parts, form and meaning. This research has been carried out with the aim of extracting and screening the effective components in the contemporary landmark buildings of Iran.

2. Research Background

In this article, in order to avoid procrastination of words and writing and also to take advantage of the useful parts of each research, they are discussed in the form of a Table 1 and the research done in the two areas of books and articles is discussed

Table 1 Research background of the studies conducted on the research topic

Name and surname, year	Title	Results
Nejati Fatemeh, Habib Farah and Shahcheraghi Azadeh (2017)	The role of the structure in beautifying the architectural space	It states that construction requirements, along with functional requirements and aesthetic issues, have different effects on the building. The review of the literature related to this research in all parts of the world shows that if one of these subgroups of these three criteria is effective and efficient in relation to the building, it can be considered one of the most successful buildings in the world. The formation of flow and circulation of forces affects the aesthetic structure of the structure.
ka Aisha Janat and Nidhis. P. J . (2016)	Aesthetic judgment and visual impact of architectural forms: a study of library buildings	The data obtained in this research show that there are certain characteristics of the building form that the current society prefers and that the aesthetic appeal of the building and its expected performance have a high positive correlation.
Vladi Mir Mako (2012)	Aesthetics in architecture: contemporary search research	It generally provides an overview of research on aesthetic issues related to architecture, urban design, and the environment. For this purpose, the article is focused on the period of the last twelve years, as a period of intensive research on the mentioned cases using new philosophical positions and intercultural values.
Baqaei, Ajang (2007)	The role of the structure in the aesthetic structure of contemporary architecture	Based on this research: First, the formation of architectural space and structure is simultaneously accompanied by visual expression. And secondly, the semantics and symbolism is such that the form of the structure is the basis of the beauty of the architectural space. So this method can create a new aesthetic structure. It also states that the connection between the form and the structure creates a special sculpture that is the result of creativity in the structure, form and special technologies in the construction.
Vinsha Nankishore et al (2017)	Aesthetic application in architecture and design	Space is the beauty of architectural design through aesthetic and emotional features, this is also important in architectural design. The emotional process of visual spaces depends on the aesthetic elements of architecture such as emotions, color, light, material, texture, shape, form, size, and also their mutual relationships. Design is the creation of a plan for the creation of an object, system, or human measurable interactions such as feelings, emotions, according to its form, function, activity, and order. The design process requires aesthetic, functional, economic and socio-political dimensions of the entire design issue.
Fangxin Ouyang and Hulian. Chen (2017)	Technological aesthetics of modern architecture as structural expression	As comprehensive arts, architecture includes structural design based on mechanics and architectural design with emphasis on aesthetics. Due to differences in their foundations and limitations and binding principles, they are not naturally united and require architects to mix both architectural design and structural design.
Fazler. Khan (2020)	Structural aesthetics in architecture and its social and	The aesthetic aspect of a building was intrinsically tied to the technology and materials of construction in early times. Unfortunately, the evolution of the architect in the modern sense of

	technological relationship	the word, which means creativity, is responsible for different professionals, that is, the architect, to see the planning and aesthetics, and the engineers to see the strength, stiffness and performance of that building. This unnatural separation of roles has been responsible for many inconsistencies between form and aesthetics on the one hand and function and technology on the other. Aesthetics was often posed as a question, an arbitrary concept of beauty rather than an inherent beauty inherent in the overall concept of a project.
Khan, Fazloor (2020)	Structural aesthetics in architecture and social communication and its technology	Structural engineering is primarily based on logic, reason, mathematics and understanding the properties of building materials and finally the forces of nature. There is very little room for the structural engineer to indulge in romantic aesthetic forms. But nature has its own inherent aesthetics. Each of the building materials, when used efficiently, simply and in a sensitive way, leads to structural solutions that have its strength and visual presence.
Ayvazian, Simon (2008)	Aesthetics and its origin in architectural criticism	The understanding of beauty is a divine gift and a mental base that leads to objectivity, and art without it is a body without a soul and devoid of attraction. In this research, architecture is viewed from such a perspective, which is a mixture of all arts. In this way, the manifestation of the spirit of its beauty - which has a spiritual connection and an external effect - is explained in the form of any trend (from traditionalism to realism and modernism) and its criticism and evaluation methods - based on known components - are pointed out.
Katayoun Taghizadeh, Mahmoud Gulabchi, Laden Vojdanzadeh (2017)	Form-changing architecture book	The construction of buildings that move like a living being has created a new philosophy in the field of architecture that exhibits dynamism and flexibility not in concept but in form. Therefore, the flexibility of form in today's architecture is a necessary and inevitable thing and it is the guarantee of its survival and meeting the demands and needs of the users of architectural spaces. Also, in many cases, such architecture requires the use of a suitable, flexible and dynamic structure, so that the physical space of such an insight is formed from the interaction of architecture and structure and provides the changing needs of the user. In order to achieve this goal, in addition to architectural design, it is one of the most important requirements to understand the behavior of structures in all stages (initial design to construction).
Ali Mokhtarian (2016)	Book of aesthetics of historical monuments	Investigate the beauty of these buildings, including the form, volume, and decorations used in them, and explore them according to the concept of beauty. Decorations used in historical works are one of the indicators that have been given less attention and have not been specifically addressed and its types have also been less introduced. This topic is one of the topics that is somehow related to the beauty of the building and the "aesthetics of the historical building" and has a great impact on the transmission of the value, cultural and architectural concepts of the buildings to the future generations.

Based on the conducted researches, it is clear that until now no research has been done on component extraction and their examination and screening with Delphi system has not been analyzed in a specific way.

3. Theoretical Foundations

3.1. Definition of Beauty

Beauty is a manifestation of a phenomenon that, after being perceived by the senses and transferred to the center of thought or observation of the perceiver, evokes reactions based on accumulated experiences in the audience. In the essence of beauty, Gruter states that when a person encounters an object or phenomenon, he receives messages from it that affect his inner feelings and shape the nature of that phenomenon in his mind (the aesthetic time geometry of a message When it reaches a certain limit, the person recognizes the body from which he received the message as beautiful. This specific limit is the amount of information that forces the receiver to form a schema and thereby improve his level of perception to a higher level. from the perceptual levels, and it can also be said that a beautiful thing makes a rich perception possible for us and this gives us satisfaction. The question of the truth of beauty, how it is perceived, its sources and effects on humans during the history of human thought has always been discussed. Various schools have given answers to these questions based on their epistemology and worldview. One of the oldest views on beauty is the view of ancient Greek thinkers, the written discussion of beauty in ancient Greece from Pythagoras began (Zamiran, 2001: 43).

3.2. Aesthetic Definition

Aesthetics is a branch of philosophy that is dedicated to conceptual and theoretical research in the field of art and aesthetic experience (Gidein, 2010: 16). In fact, aesthetics is one of the five classic philosophical disciplines, along with the theory of cognition, logic, ethics and metaphysics, which is defined as the theory of reflection in aesthetic judges. Of course, this term has been studied throughout history by adopting different viewpoints and has taken on different meanings based on different schools of thought. Until, in the 18th century, the German philosopher Baumgarten changed the meaning of this term to the pleasure of the senses or the satisfaction of the senses, and since then, aesthetics has risen as an independent system alongside logic and ethics and was added to the philosophical vocabulary, although at the end of this century, this term was also removed from the monopoly of philosophy and became an inseparable part of common language (Mozini, 1997: 73).

4. Factors Affecting Beauty in Architecture

4.1. Environment

Between every living being and its surroundings, there are relationships that are not formed by birth. These relationships are mostly acquired, which means that humans must learn the concept of objects in relation to their environment, this knowledge gives us the power to control our environment even without everything being directly exposed to our perception at any moment. Mariobuta Communication The building should describe its surroundings as follows: the architectural work has a special environment related to itself. In a simpler way, this special environment can be called the foundation of the building. It can be said that this platform and its architecture are in constant bilateral contact and are always connected to each other (Heidegger, Hacking-Thomas, and Cowan-Donald, 2017).

4.2. Space

Space is not something that has a precise and specific definition, but it can be measured. Aristotle compares space with a container and considers it an empty place that must be around it in order to exist, and as a result, it always has an end (Schultz, 2013: 44).

4.3. Form

The aesthetics of the form or face is a clear and sensual manifestation of an object, and this is an expression that exposes itself to judgment. Louis Kahn says: the face is not the same as the shape, the shape is related to the design, but it deals with the display of inseparable components, the form is chosen in such a way that it matches the content and idea of the design. The form depends on various factors (Zamiran, 2001: 24).

4.4. Coordination

Harmony is a term that is talked about in most of the natural and intellectual sciences. In aesthetics, harmony means the order that exists between the constituent parts of a phenomenon. In ancient Greek mythology, Hamona is the daughter of Aras, the god of war, and one of the main elements. Aesthetics is architecture and its scope is not limited to the dimensions of space in any way. Harmony in visual perception is not separate from visual balance. Physical and psychological perception systems all tend to reach a state in which the level of tension is as low as possible (Ayvazian, 2008: 64).

4.5. Signs and Symbols

For example, in the first place, the apparent dimension of the circle can be a part of a pattern, and in this example, it is a part of a decorative thread and does not have any kind of semantic content. Each form has its own movement. The circle is a form without direction, the lines of the circle structure are radially from the center of the circle to its circumference and vice versa from the circumference to the center. These attributes give the circle expressive power, the effects of which can be seen in its use in architecture. This is the first aspect of the semantic analysis of the circle form. The use of this form in architecture has universal validity. This means that it includes attributes that can be understood without prior knowledge or special knowledge. Here, it is the type of form that has been subjected (semantic content) and this means that the form of the supplier circle and it expresses spirituality.

4.6. Decoration

An important main pillar in architecture, which has more of an appearance than a meaning, and perhaps does not have a meaning at all, is the emphasis on form (Sadeghi, 2015: 44).

4.7. Structure

The structure today is created by knowing the forces and their analysis, load transfer systems or systems, and the behavior of the materials and components of the structures can be determined through theoretical relationships. Also, the development and advancement of computer facilities has made it possible to analyze the behavior of structures before construction. The way of creation, the distribution of forces, as well as the investigation and study of the behavior of materials and their

bearing and load capacity, and the behavioral classification and load system of various devices, constitute the topics of structural science; Therefore, now the structure serves the world of science as a specialty, and in the field of architecture, it enables architects to improve and expand the quality and scale of their constructions and make architectural evolution possible (Sadeghi, 2015: 16). The investigation of the structure shows that the structure is formed based on technical rules, but it also conforms to the building plan, therefore, in this situation, the structure provides facilities to the space and is compatible with its logic and provides a resistant form. The structure may be visible, hidden or semi-visible. Elvadoori states that the structure has requirements including balance, stability, resistance, performance, economy and form: balance, which is the most important thing, means the state of non-movement and stillness in the whole and the components of the building. If the forces acting on the object are in balance with each other, the object will not move in that direction and this situation is called equilibrium. In fact, equal and opposite forces cause balance in the desired direction. In this condition, the external forces and the internal and external reactions of the body are in balance. Resistance in a structural element (which is related to internal forces) means that the components of the structure are flawless and the ability to bear the loads applied to these components. This concept, which is directly related to the material of the instruments, means the tolerance of an element of the instruments under the forces. Stability means the building's resistance against overturning (against external forces) without its components being separated, which is called geometric stability. Geometric stability is related to the number and types of connections and how they are used (simple connections or rollers and complex connections such as joints). On the other hand, there is resistance stability (internal stability) which is the concept of bearing load of material particles of the body under the influence of forces. The performance of a structure means its proper bearing; That is, there is no more or less in the structure, and the materials are used economically and correctly, and this is the force that creates forms (Mirkhalili, 2014: 46). Economy is one of the requirements of a structure, and it is a suitable structure in which the forces flow easily and there is no more or less planning in it. Although structural efficiency is a major issue, other factors such as production, control and construction should also be considered in the selection of system builders. The economy of the building is affected by the available technology and the speed of construction. The form of the structure, as one of the design components, plays the main role in creating the form; Therefore, the form of the structure itself is considered one of the structural components. Shaping forms is the creation of beauty through cutting and appropriate size, in order to facilitate the flow of power, which is important. Such forms are visually beautiful and effective. Power is the basic pillar of the structure and its most important part. In fact, the structure is a geometric order for the transfer and flow of forces.

4.8. Structure and Architecture

The presence of the phenomenon of technology should be seen and measured. It is interesting that it does not matter in what time and place we examine the architecture, because in order to measure the architectural works in different periods and the amount of presence of the structure and the relationship between the structure and the form, the type and level of technology of that time period must be measured. For this purpose, technology has two complementary and distinct aspects that affect the amount of form and structure innovation (Mirkhalili, 2014: 114).

- Construction and implementation technology
- Material technology

In the technology of construction and implementation, various factors such as the science of calculating the stability of the building and how to deal with the design geometry are important, and

the implementation of any type of geometry and pattern is based on the amount and type of science that is effective in the stability of the form. Whether it was in the Gothic, Timurid, or Seljuk periods, or in the form of the science of calculating the stability of the structure, which today computer technology is able to do, it has had a strong and significant impact on the shape of the structure in both its historical and contemporary states.

From the beginning of the documented history of architecture, the three categories "structure, architecture and construction technology have been the same in their original meaning at any time, and the person who was called "architect" had expertise in all three areas of expertise and knowledge, or in today's word, expertise (Grout and Wang, 2013: 174). This expertise and insight in all three fields emerged due to the continuity of the nature of the fields. The distinction that exists between these three fields today emerged when the awareness and knowledge related to these three fields grew and expanded and became complex. Undoubtedly, the issue started with a problem called construction technology, and the necessity of the construction issue started with the need to have shelter for humans. So, this early man's intelligence regarding what he needed and his basic understanding of the structure caused the shelter to remain firmly in place. So, the first constructions by human hands in terms of historiography have been structural instruments combined with the knowledge of construction. Human hands are valuable in terms of having knowledge of construction and insight, although experimental and elementary, from the behavior of the forms of instruments, it can be concluded that having creativity is necessary for leaps in the problem of construction. And the structure is relevant even if we do not enter into its artistic field, the connection of the three elements of architectural structure and construction technology continued in the historical fields, and since the artistic nature of man also entered the field of construction and with the help of creativity, humans in every era were able to use the technique achieve the specific construction of the same period (Hejazi, and Mehdizadeh Saradj, 2014: 49). Three important factors: 1- the emergence of a structural idea and the transformation of that idea into a form, 2- creativity and innovation, 3- the new dimensions of aesthetics are the result of the creative alignment of structure and architecture.

It is necessary to refer to words that do not have a proper equivalent in Persian, and this word is the result of meanings and concepts that refer to the important points of this speech. Tektanics refers to a quality of architecture, which means building things that are both beautiful and useful. In general, there is another quality in architecture, which we call mastery of construction, or a master in construction, and this quality also gradually brings building technology closer to art. It links architectural structure and construction technique to a common quality. which has created brilliant periods in architecture (Hashemnejad and Soleimani, 2008).

In the Gothic and Seljuk periods in Isfahan Jame Mosque and in the small dome, known as the dome, the construction date of this dome is about 1088 AD, which is praised by the researchers of the world. And in the Gothic period, the transmission system is exactly logical with the structural forms and the spirit of the Gothic space, and the invention of the famous Gothic backs, which is a type of identity and style for that period, confirms this fact that the structure and the aesthetics of architecture are linked construction methods. Power is clearly and clearly shown by the forms and performance of style (Heidegger, Hacking-Thomas, and Cowan-Donald, 2017).

The new and modern design is based on the study of the solutions of the power transmission organism in the materials that create the architecture (for example, in Gothic, the same stones as the main body, and in new architectures, the same new structures that form the architectural forms, this method can be a kind of "organic structural solution" This solution is based on parts and independent implementation, which at the same time performs the task of power transmission, also

defines and makes the architectural form visible, as a result, by using the organic integration of the structure and the architectural form and the solutions based on The basis of steel structures and metal alloys or concrete is the integration of the architectural form and the power transmission organism (Jafari, 2015: 244). And this is the similarity in the architecture aligned with the structure and Gothic architecture, which is the use of stones and stone materials and the type of arrangement. and the forms based on the directions of energy consumption, the theories and experiences of Violet Ludok in the middle of the 19th century based on the Gothic lessons; he used steel structures in the form and volume and theme or internal views, the shape of his structures, whose form is according to the flow of forces and brings a kind of architectural integrity. The following is a theoretical summary Fig 1;

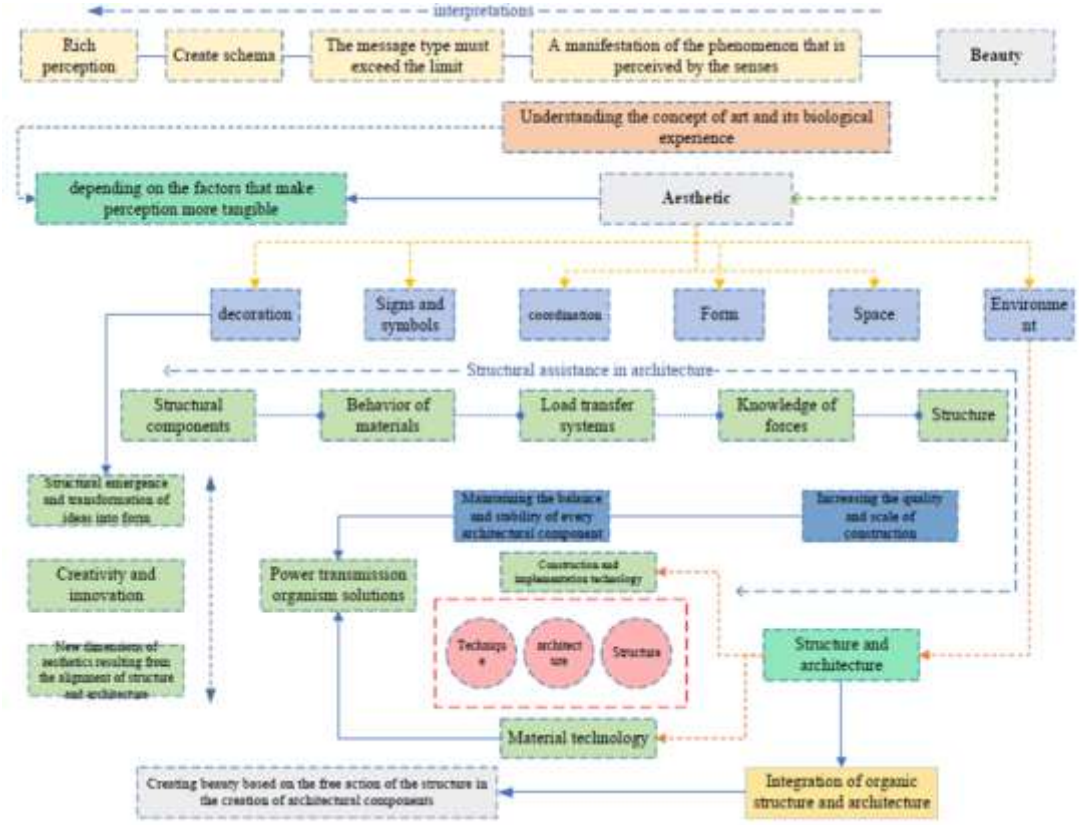

Fig 1 Theoretical summary diagram related to the aesthetics of structure and architecture

5. Research Methodology

The research method of the mentioned study is applied in terms of its purpose and in terms of the combined method (qualitative-quantitative). In terms of the type of Delphi research, this research is decision-making and in terms of the Delphi approach, it is a confirmatory phase, and it is done in one stage, which is used to screen the factors. It is a combination because until now some components have not been stated and examined in the theoretical field. In the qualitative stage, it is necessary to conduct a semi-structured interview with the thinkers and by reducing the data, we arrive at the conceptual codes in the open field, then we start to center the components based on the dimensions governing the aesthetics of architecture.

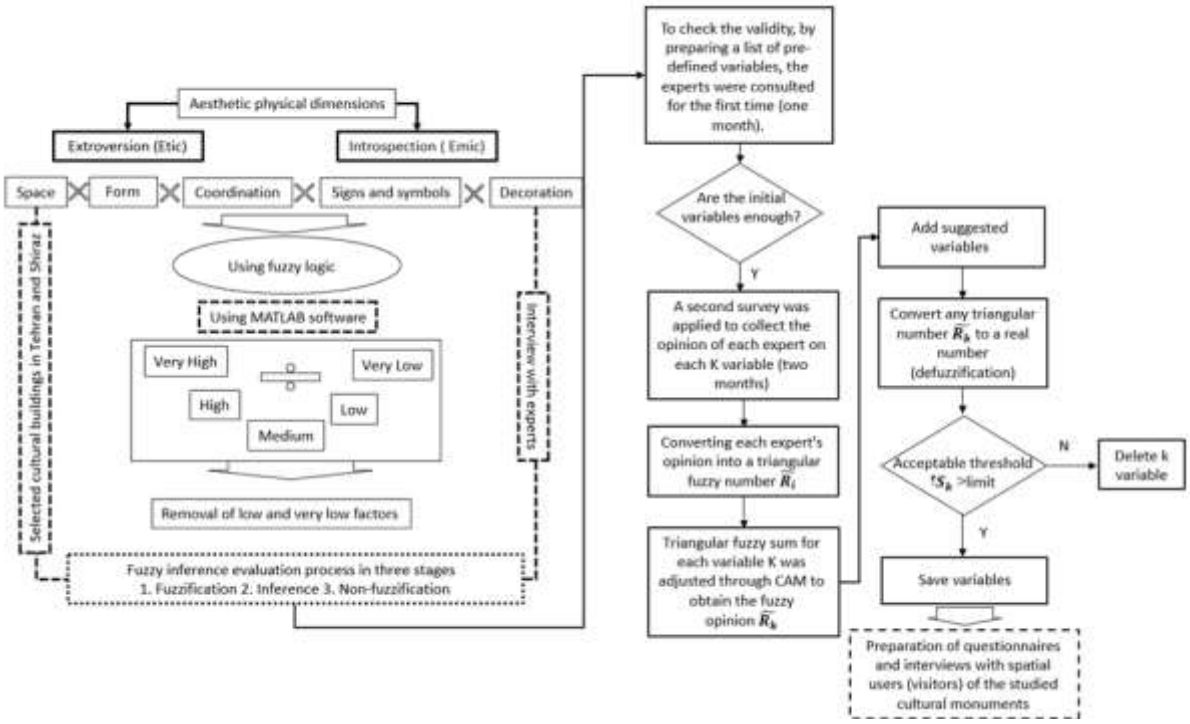

Fig 2 The steps of performing the fuzzy Delphi research method

In the next step, to check and evaluate the need for a field method with a questionnaire, experts were first interviewed to compile the questionnaire. Choosing the circle of experts is a very important part of the Delphi method. The awareness of this group is a good guarantee for the high quality of Delphi results; Therefore, the members of the Delphi circle in a study are selected based on specialization, not based on a random selection process. As a result, the researchers first selected a list of 14 university professors who have extensive knowledge and vision in the field of aesthetics and the relationship between structure and architecture and who have scientific-research articles and ISI. In the first stage, a semi-structured interview was arranged. In these interviews, the researcher tried to explore the approach and its relationship with the field of urban planning and architecture and identify the experts' view on the subject of aesthetic components of the relationship between form and structure in culturally significant buildings from their point of view. Also, due to the vastness and abundance of the cultural index buildings of contemporary Iranian architecture, by using the desirable sampling method and the preference system, several cultural buildings that have a high Kendall agreement coefficient and, according to the professors, have high characteristics of the relationship between structure and architecture are selected. become

In the second survey, it was used to collect the opinion of each specialist about each K variable. If a variable is suggested, it is added to the list and additional variables are deleted. Finally, the desired questionnaire was compiled. The structure of the questionnaire including questions related to the main question of the research; That is, the examination of the effect of each of the components of the beauty of the structure and architecture in the cultural landmark buildings of the contemporary period and in the direction of responding to it. According to experts, sense of place codes and variables were classified into 6 thematic categories. These categories were: environment,

space, form, harmony, signs and symbols, decoration. Then, the extracted variables were examined by a group of fourteen experts in the form of a closed questionnaire with five-point Likert answers. According to the selected components, the questions related to each factor include points, from their sum, we reach the score related to the aesthetic components, which is examined separately for each element, according to this analysis, we come to the conclusion that whether One of the mentioned components is effective or not in the beauty of cultural landmark buildings and also their effectiveness is determined qualitatively. In order to do the calculations, a score of 5 for "very high impact" and a score of 1 for "very low impact" were considered by each expert. In order to minimize the cost and time, the questionnaire was distributed among a random sample of the statistical community of space users. The sample size was selected using Morgan's table, which includes 384 people who were randomly distributed in selected cultural index buildings according to the population. In order to measure the reliability and validity of the measurement tool, the pre-test method was also used.

5.1. Measurement Range

The introduced examples of buildings built are contemporary cultural buildings in the last two decades. Be one of the pioneer and famous architects. Also, based on the results of theoretical consensus, two buildings from outside Tehran and from Shiraz have been introduced, and one of the three has not been selected. In this research, sampling is based on the table of entry and exit criteria for the research:

Table 2 Entry and exit criteria in qualitative research

Selection criteria for interview	The criteria for leaving the building research	Entry criteria for building research
Be a faculty member	Not located in the city	There should be a theoretical consensus in choosing it
Familiarity with tectonic topics	Its residents do not have enough information about it	An important cultural collection is a beautiful opinion
Have an article about one of the title variables	have certain limitations in design	Its information is accessible
Have a cultural building design	Part of it is designed by someone else	In the preference system, its Kendall coefficient score should be higher than 0.5
It should be under the field of architecture or urban planning or civil engineering	Be restored	Various materials are used in it and it has technology in the application of materials

Also, the way to choose them is based on purposeful sampling and based on the researcher's observations. The snowball sampling system is used in the interview and selection of the expert panel in future research Delphi. The result of the selection for the correctness of the action and the validity of the form comes from the university professors of the question. In the quantitative stage, the distribution of questionnaires was random. The characteristics of the selected buildings are shown in Table 3.

Table 3 Selected buildings and Kendall w of selected buildings to enter the research

Name of cultural monument	Description	Kendall coefficient	Images
The Book Garden Collection 2006	It is a collection of books and scientific entertainment stores in Abbas Abad area of Tehran. This garden is adjacent to the National Library of Iran from the east, from the north-east with the academies of science, Persian language and literature, from the north-west with the art garden, and from the west with the holy defense museum garden. A part of this garden belongs to Abba company, under the management of Raiseh Ali Moghadam, Amin Azizi and Abbas Elhiari. The area of the Tehran Book Garden is 110 thousand square meters, of which 65 thousand square meters are exhibition buildings, conference and administrative halls, and the rest is green space and It forms an artificial lake. The interior of Tehran Book Garden consists of four main sections named Baharestan (children and teenagers), Khyalestan (digital technologies), Nagarestan (cinema halls) and Sarvestan (general and adults) and is built on two floors.	0.812	

Tehran Theater Campus 2005	It is the largest theater complex in Iran, which is located in the 15th district of Tehran. The building of Khavaran Theater is built on a land of 2800 square meters with an infrastructure of about 16000 square meters. Khavaran Theater is a specialized center for theater. This center was built in the neighborhood of Khavaran Cultural Center. Tehran Municipality has reported that this demonstration center will start working in the middle of June 2013. This art and cultural center is going to be used as a host for international drama festivals. Khavaran Theater has a capacity of 1000 people and has the capacity to hold musical theater, traditional theater, symphony orchestra performance and music concert. This center has 4 experimental theaters with a capacity of 150 people and a special hall for puppet shows.	0.642	
Mellat Gallery Cinema Campus (2013)	It has been built in district 3 of Tehran Municipality and on a long land with an indefinite shape with an area of 6,000 square meters and an infrastructure of 15,000 meters in the southwest end of Bostan Mellat (Melat Park). Mellat campus has 11 theaters for cinema and one hall for various cultural gatherings. This complex has suitable spaces for holding various festivals and exhibitions. There is a gallery with advanced lighting facilities to hold various art exhibitions in the Mellat campus complex. There is a food court with a variety of Iranian and foreign dishes in a beautiful environment and a unique view in this complex.	0.743	

The National Library of Iran (2004)	The building of the National Library is located on Shahid Haqqani Highway and the National Archives of Iran Building is located on Mirdamad Street in Tehran. This cultural complex has 12 provincial branches across the country. The Membership Department of the National Library and Documents Organization of Iran is responsible for checking and confirming the membership conditions for clients and determining their membership levels. The building of the National Library is located on Shahid Haqqani Highway and the National Archives of Iran Building is located on Mirdamad Street in Tehran. This cultural complex has 12 provincial branches across the country. The Membership Department of the National Library and Documents Organization of Iran is responsible for checking and confirming the membership conditions for clients and determining their membership levels.	0.584	

Azadi Cinema Campus (2016)	After many struggles, the renovation project of Azadi cinema was started on the 29th day of April 2016 in a ceremony attended by Mohammad Baqer Qalibaf, a number of senior managers of Tehran Municipality and cultural institutions of the country. The executive operation of Azadi Cinema renovation started seriously in 2005 with the participation of Tehran Municipality and ended at the end of February 2006. The new commercial-cultural complex of Cinema Azadi has 5 halls, including one hall for 600 people and four halls for 200 people, two restaurants, three coffee shops and 4 commercial floors named Azadi Cinema Campus. Currently, the management of this cinema campus is under the responsibility of Reza Saidipour, which is the most visited cinema in the country with more than 120,000 visitors per month.	0.416	

Tamasha Cinematic Campus (2013)	A cultural-artistic complex located in the 18th district of Tehran (the beginning of Madain Blvd. and a few tens of meters from Maalem Square), equipped with a hall for 318 people and two halls for 150 people, a restaurant, a tea house, and a skate hall planned on the last floor. The toy house is a service-commercial complex including 70 stores, parking, etc., which was opened in the winter of 2006 with the presence of the mayor of Tehran. The complex is built on four floors and in an area equivalent to 4000 square meters and an underground surface of 7400 square meters (2500 meters underground) and it has one hall with a capacity of 318 and two halls with a capacity of 150 people. Iran has been considered. The process of designing and building the complex has taken three years of time and forty billion Rials in cost, and according to the claims of its creators, they have tried to use the world's latest technology in all fields during the entire process of design and implementation until operation.	0.511	

The Green Land of Sadra (2012)	"Sarzamin Sabz" is a multipurpose complex with an area of 461,787 square meters, located in the new city of Sadra. The city of Sadra was planned in the seventies and is located eighteen kilometers northwest of Shiraz. So far, the "Green Land" complex has played an important role in strengthening the tourist attractions of this new city. This complex is designed with the purpose of bodybuilding on the theme of an exhibition, which has facilities such as gallery restaurant, gallery cafe, entertainment, sports and business center. The design process is formed with the approach of expressing clearly that this idea can be extended to different aspects of the project, including materials and functions. Therefore, in the collection of Sarsazmin Sabz, a single body is assigned to each activity, and the collection of these volumes together creates a single whole. "Adaptation" and "mixing" are the most important issues that come to mind in different scales of the state of this collection. The placement of buildings in the bed, their arrangement next to each other and the placement of the whole complex in the natural bed of Sadra city are examples of this statement.	0.715	

Cultural and Cinematic Art Collection of Aftab City (2016)	In recent years, large movie theaters have been replaced by collections of several small theaters. In many cases, other public uses such as entertainment and commercial centers are built next to these complexes. This is a good opportunity for cinemas as a cultural space to play the role of a suitable platform for citizens' interactions in these collections. Therefore, one of the basic goals in designing the Artshahr Aftab complex has been to create a multi-purpose landmark as a center for social interactions and artistic and cultural events. In a sense, we have been looking for a cultural hangout that can facilitate communication between all sections of the society (children, elderly and disabled, etc.)	0.411	

5.2. Fuzzy Delphi Method

Fuzzy logic is a mathematical theory used to express the complexity of unstructured problems. Fuzzy set is a function that can show the possible value of a set number between zero and one as a degree of membership. In general, the evaluation process of fuzzy inference includes three stages: 1. Fuzzification, 2. Inference, and 3. De-fuzzification (Wu and Fang, 2011: 758). The purpose of this research is to reach the most reliable agreement of a group of experts on a specific topic, which is done by using a questionnaire and asking experts' opinions, repeatedly, according to their feedback. In fact, this method is a complete examination of the opinions of experts, with three main features, unbiased answers to questions and receiving their feedback and their statistical analysis, answering questions in the Delphi method, the subjective data of experts is transformed into almost objective data using statistical analysis. This method leads to consensus in decision making. The Delphi method has been used in many fields of prediction, decision-making and screening (Stone Fish and Busby, 2005: 241).

Some of its applications are: technological foresight, service analysis, factor screening, etc. In the world around us, issues cannot be divided into two or more white or black categories, but each issue fits into a spectrum (Linstone and Murray, 2002). Using definite numbers in solving problems such as prediction and classification will lead to results that are out of reality. The use of this method in order to make decisions and reach consensus on issues where the goals and parameters are not clearly defined. It leads to very valuable results (Cheng and Lin, 2002: 77). In this method, thinkers present their ideas in the form of minimum possible, most probable value and maximum (triangular fuzzification).

5.3. Fuzzification

The main necessity in designing a fuzzy system is the selection of membership functions for linguistic variables. The importance of the obtained effect was defined by linguistic values (very low VL, low L, medium M, high H and very high VH). To screen the factors in the open spaces of the residential complex, the factors that are placed in low and very low floors will be removed from the list of factors affecting the sense of place.

Table 4 Membership functions related to the profile and the importance of the effect to obtain the degree of membership

Function type	Membership function
Very low	$\mu_{VL} = \begin{bmatrix} 1 & 0 \le x \le 0.2 \\ -6.25\,x+2.25 & 0.2 \le x \le 0.36 \end{bmatrix}$
low	$\mu_{L} = \begin{bmatrix} 6.25x-1.25 & 0.2 \le x \le 0.36 \\ -6.25\,x+2.25 & 0.36 \le x \le 0.52 \end{bmatrix}$
average	$\mu_{M} = \begin{bmatrix} 6.25x-2.25 & 0.36 \le x \le 0.52 \\ -6.25\,x+4.25 & 0.52 \le x \le 0.68 \end{bmatrix}$
high	$\mu_{H} = \begin{bmatrix} 6.25x-3.25 & 0.52 \le x \le 0.68 \\ -6.25\,x+5.25 & 0.68 \le x \le 0.84 \end{bmatrix}$
Very high	$\mu_{VH} = \begin{bmatrix} 6.25x-4.25 & 0.68 \le x \le 0.84 \\ 1 & 0.84 \le x \le 1 \end{bmatrix}$

5.4. Conclusion

The most important part in the fuzzy inference method is to build the law base. The purpose of writing these rules is to define diverse propositions that are obtained by combining different states defined for each profile (base and complement) (Poor Ghasemi et al., 2008: 381; Shakibaei, 2008: 151).

5.5. Defuzzification

De-fuzzification is a unit that has functioned from a fuzzy set to a definite value. In this study, the final deterministic value, in fact, the center under the surface of the curve in the final fuzzy sets, was obtained (Amini Fashkhudi, 2014: 39-45). The final value of the output is calculated from the following equation, where y is the output value, μ(y) is the degree of membership of the output y, and $\bar{Y}$ is the true value of the output.

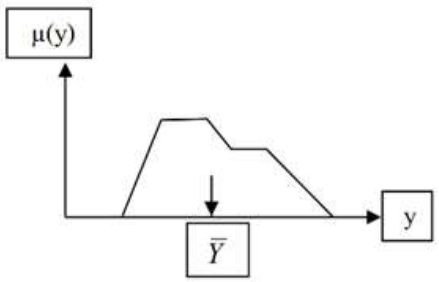

Fig 3 The method of defuzzification the center of gravity (Monem et al., 2007: 34)

5.6. Statistical Population of Participants

The statistical population is the thinkers and experts in the field of architecture and urban planning, who are experts in the field of architecture and urban planning, and 33 of them are selected as the sample size. The first person is selected in a targeted manner and the next ones are selected in a snowball manner.

Table 5 The sample size of selected experts and elites

Number	Field of activity	Position
5	Urban planning	University professor
8	architecture	University professor
7	Urban	University professor
6	Cultural buildings and town design	Professional designers
4	Urban sociologist	University professor
3	Behavioral psychologist	University professor

At this stage, the criteria for entering the research are selected for the selected people, which include the following items, and if they are selected as a snowball sample and do not have the following items, they will be removed from the list;

- Have an article in the field of physical aesthetics or tectonics in architecture or urban planning
- Have a design experience in transnational cultural projects at the provincial level.
- Familiarity with scoring methods in fuzzy Delphi methods and its concepts.
- He has visited cultural landmarks with national value

6. Research Findings

In this research, after semi-structured interviews, the texts are extracted and entered into the ATLASTI software in the form of textual data, and the data is subjected to data reduction with the approach of description and interpretation as well as live coding. The results after extracting the number of 44 codes were open, of which 8 codes were removed due to non-compliance with themes and concepts. The most prominent code includes the method of connection with the number of 28 and the least prominence related to the mass of space with the number of 6. Then, they are categorized based on the pre-prepared code that includes the central code of environment, coordination, signs and symbols, decoration, form and space. The results are depicted in Fig 4.

In this study, the importance of the factors that make up the sense of place was calculated using Matlab software, and they were classified based on the degree of membership, and the findings of the aforementioned method are shown in the following Fig 5.

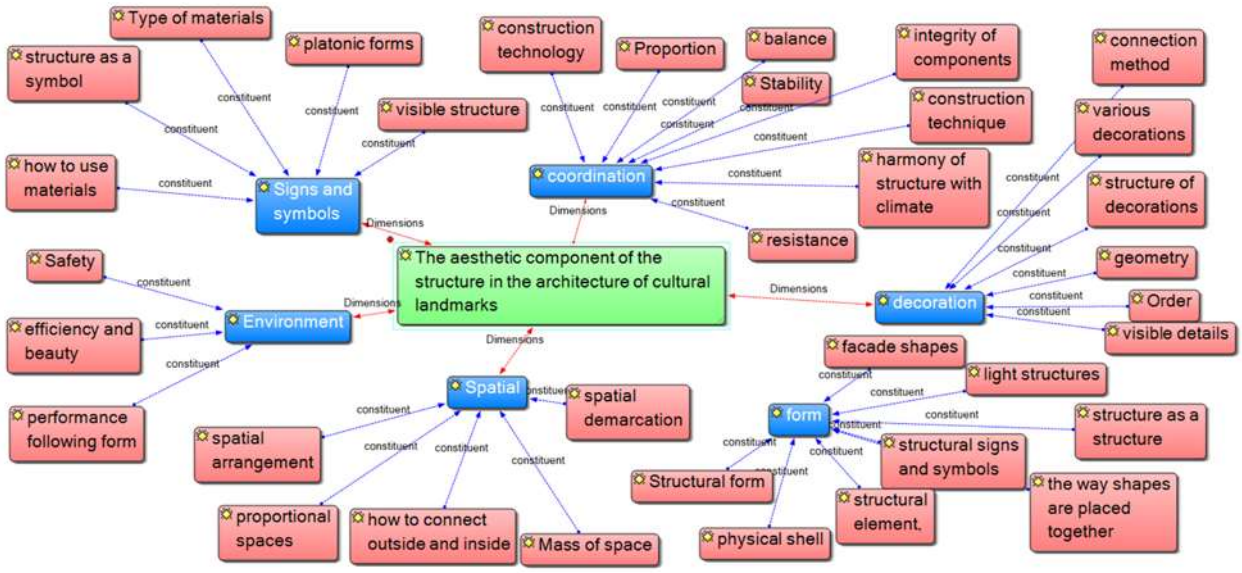

Fig 4 Open and axial coding of concepts in ATLASTI software

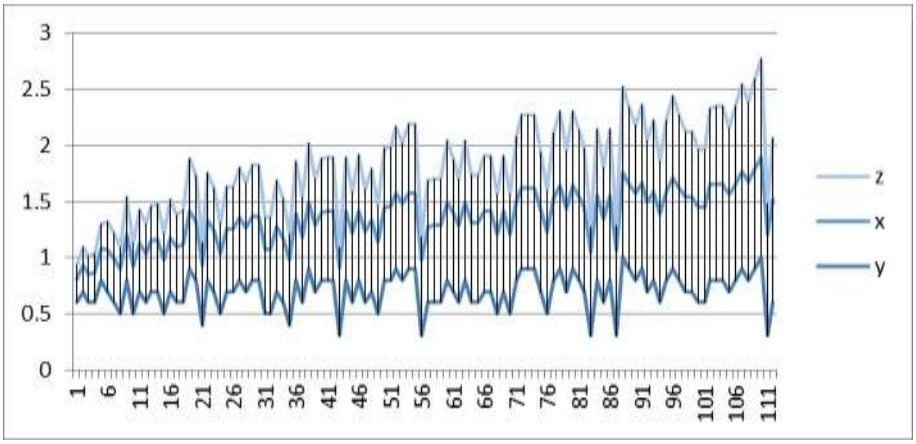

Fig 5 Classification diagram of the importance of each linguistic variable

According to the above figure, the importance of the effect of each language variable is shown in the table below. In order to evaluate the fuzzy model, the aesthetic components of the structure in architecture and the features whose quality was determined by expert experts according to the desired quality index were calculated using the software and used as the output of the fuzzy model. In fuzzy logic, a work belongs to two membership functions with different degrees of membership. Finally, the highest degree of membership determines the importance of the effect of the type of linguistic variable. When the variable x is increasing, the amount of the effect value is changing and increasing from a very low attribute (very low linguistic variable) to a very high attribute, which is shown in the table below; That is, as we move towards increasing the variable x, the value of the language variable increases in each class, which is seen in the output of the matrix as a class, for example, if the variable is x=0.53, it belongs to the middle class and If the variable is x=0.67, even though it has increased numerically, it still belongs to the middle class. The fuzzy Delphi method of

this fuzzy logic solves this problem, and its output is meaningful based on the degree of membership, and for example, if the output of the fuzzy logic is Y^ = 0.67, then the fuzzy logic determines the degree of membership for two membership functions. It improves slowness and uncertainty.

In the environmental dimension, the highest degree of membership is related to the component of performance following the form with a value of 0.55 and the final class M, and the lowest is related to safety with a degree of membership of 0.37 and the final class L. In the decoration dimension, the highest degree of membership is related to visible details with a value of 0.87 and the final class is VH, and the lowest degree of membership is related to the component of the method of connection with a value of 0.59 and the final class is M. In the formal dimension, the structure component is a structure with a value of 0.87 and the final class VH is the most and the least related to structural signs and symbols with a membership degree of 0.77 and the final class H and the least is related to spatial arrangement with the final class VL and a membership degree of 0.21. In terms of signs and symbols, Platonic forms with membership degree of 0.89 and final class VH are the most and least related to the way of using materials with membership degree of 0.44 and final class L. In the coordination dimension, the balance component with membership degree of 0.78 and the final class H is the highest and the lowest is related to resistance with the value of 0.41.

Table 6 Degree of membership and final category of components

Fuzzy Logic							
Dimensions	Component	Degree of membership	Final floor	Dimensions	Component	Degree of membership	Final floor
Spatial	Appropriate spaces	0.53	M	Environment	safety	0.37	L
	Spatial arrangement	0.21	VL		Function follows form	0.55	M
	How to connect outside and inside	0.56	M		Efficiency and beauty	0.53	M
	Spatial demarcation	0.77	H	Decoration	Discipline	0.71	H
	mass of space	0.61	H		Various decorations	0.69	H
Signs and symbols	Visible structures	0.69	H		Decoration structure	0.59	M
	Structure as a symbol	0.54	M		The geometry	0.81	VH
	Platonic forms	0.89	VH		Visible details	0.87	VH
	How to use materials	0.44	L		Connection method	0.59	M
	Type of material	0.56	M	Form	Form	0.79	H
Coordination	sustainability	0.69	H		Structural forms	0.46	L
	Construction technology	0.58	M		body shell	0.51	L
	Coordination of the structure with the climate	0.61	M		The shape of the facade	0.60	M
	the balance	0.78	H		The way shapes are placed together	0.87	VH
	Component integrity	0.43	L		Structural signs and symbols	0.21	VL
	fan made	0.58	M		Structural elements	0.84	VH
	resistance	0.41	L		Structure as structure	0.87	VH
	Proportion	0.53	M		Light structures	0.57	M

In the Fig 6, an example of the surface observer of the fuzzy model is presented considering the influence of 36 variables in different dimensions as input variables. In this figure, you can see how different input values affect an output value in different dimensions. In the sense that you can see the reaction in one view. According to the figure below, the mentioned components in the aesthetics of the structure and effective architecture are associated with an almost irregular trend of the quality level recorded in the surface observer.

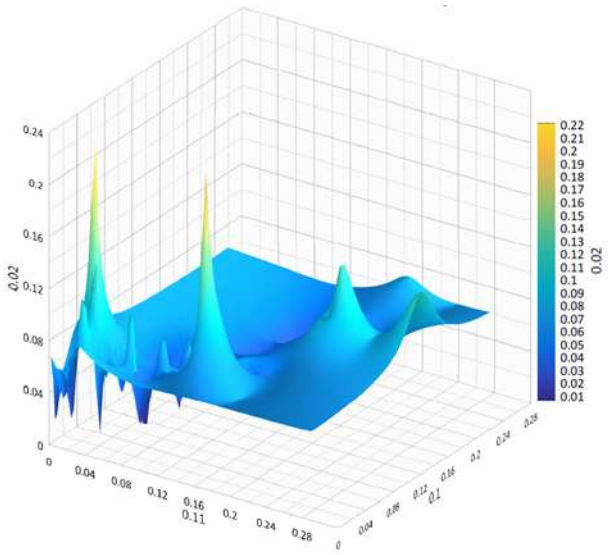

Fig 6 The variable extracted from the aesthetics of the structure in architecture with MATLAB software

In this order, relying on the previous table and considering the direct effect of the studied indicators on the aesthetic level of the structure in the mentioned architecture, the frequency distribution of the maximum and minimum in the components mentioned in the image below was visited in the field and confirmed the accuracy of the effect. Each variable of the linear regression diagram for the factors is drawn, which indicates the accuracy of the influence of the factors in two sets, both lines benefit from a curved slope.

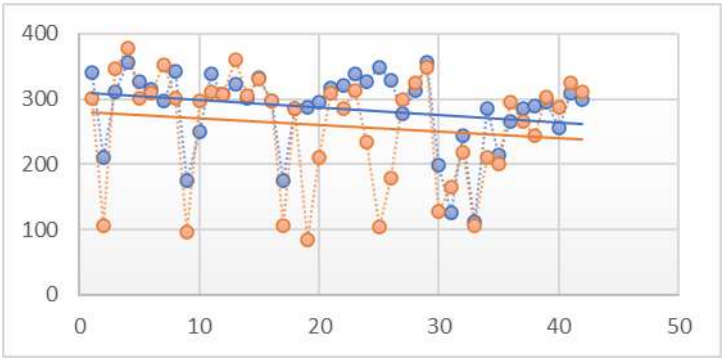

Fig 7 The distribution of the aesthetic variables of the structure in the architecture of cultural buildings and linear drawing

7. Discussion

In addition to being an arena for the formation and strengthening of social and cultural interactions, cultural landmark buildings are also a place to display the fields of architectural design and the interaction of the structure with it, with an emphasis on aesthetic aspects. Also, these places help to strengthen local and national cultures by promoting it in physical aspects. This research showed that there are aspects and components that can be addressed to create beauty in the interaction of the structure with architecture.

Based on the interviews conducted, 36 codes were extracted, which needed to be placed on the governing dimensions extracted from the theoretical field for convenience and data reduction. Therefore, the axes are predetermined and the components are placed in it. The results of the qualitative field are different from the quantitative field, and due to the difference between the designer and user groups, the design criteria in cultural works should be the users' ideas. In the quantitative and fuzzy Delphi section, in order to achieve an easier design and the use of components with higher values, it was necessary to remove a number of them that had less impact, for this reason, the following components with these characteristics were removed;

From the environmental dimension, safety with L class and membership degree of 0.37 are removed. In the formal dimension, structural form with final L class and membership degree of 0.46 and physical shell with L final class and membership degree of 0.51 and signs and symbols A structure with a degree of membership of 0.21 of the VL floor is removed. In the spatial dimension, spatial arrangement with membership degree of 0.21 and the final floor VL, and in the dimension of signs and nods, how to use materials with the membership degree of 0.44 and the final floor L, and in the dimension of the integration of components and the membership degree of 0.43 and the final floor L and resistance with the membership degree of 0.41 and the final class L are removed. In general, 8 components are removed from them and the number of components with high impact reaches 28 items.

Among all the dimensions, the only dimension from which no components are removed is decoration. This shows that the use of components in a decorative and structural way adds a significant amount to their beauty.

8. Conclusion

There is a close relationship between aesthetics and architecture. People who care a lot about aesthetics in architecture usually give great importance to aesthetic matters when building a structure. And they are thinking about how to use different parts including harmony, proportion, rhythm, scale, etc. to create the right beauty. Modeling a structure is one of the first topics that attract your attention. If a building is architecturally interesting, it often becomes a landmark that defines a city. This makes tourists to see it from all over the world.

Monumental buildings often imitate certain architectural styles that are immediately recognizable. Many of these design elements are still used by architectural and design consultants. They also use endless principles of good design as inspiration for their design projects.

Architectural design is used to achieve the visual beauty and eye appeal of space users. These designs are based on a shape or structure that is used as the ossification of the form or body in space. The structure is proposed as an elaborate way to display the integration of the structure with the form of the body with elaborate solutions, and when they are placed on the integration of the form and the structure, from there the aesthetic issues related to architecture enter the category of structure and stability. Structures in different buildings and especially cultural buildings where the

architect can reach the peak of creativity have increased the spatial quality. For more efficiency between the interaction of structure and architecture in achieving aesthetics, the following works are suggested;

Using the structure as decorations in order to provide order and neatness and to display the technologies appropriate to the time

Attention to structural elements in the environment to depict the link between form and structural technology instead of using physical forms.

The use of regular shapes in architectural designs to create easier structural ossification and division of static forces, as well as focus on balance and stability.

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