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In the Name of God

Dear Readers,

I, on behalf of the editorial board, am proud to present this issue of the *International Journal of Applied Arts Studies (IJAPAS)* under the sponsorship of the Islamic Azad University, Yazd Branch. We were driven to found the *IJAPAS* by a noticeable lack of journals, in the Islamic Republic of Iran in particular, devoted to architecture, urban design, urban planning, architectural conservation and restoration, painting, art history, graphic, digital arts, fashion design, performing art, industrial design, aesthetics and semantics. Although the academic world is increasingly driven by cross-disciplinary visions and models, we seek multi-disciplinary views, an attempt to inform researchers, graduate students, and professionals about the trends, ideas and innovations being put forward in applied arts. To this end, in addition to standard articles, in every volume of the *IJAPAS* we hope to provide a special issue related to a respective field with innovation.

We are also sending out a call for papers related to *Applied Arts* to appear in the next issue of *IJAPAS* in Feb – Mar 2022.

Finally, I should mention that we are committed to a speedy refereeing process for every article submitted to us. We effort to reply to all papers submitted within five weeks' time with a response about acceptance or rejection. We also do not require formatting for submissions in our style until *after* the paper has been accepted by us for publication.

I would like to thank our Editorial Board for their work so far in helping to establish the *IJAPAS*. And, finally, I would like to extend my deepest gratitude to Dr. Ali Boloor, the assistant editor of the *IJAPAS*, for all of his hard work to ensure the timely completion of the issue.

I am delighted to invite you to visit us at www.ijapas.org.

Sincerely,

Dr. Abolfazl Davodi Roknabadi
Editor-in-Chief
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Evaluation of the Components of Design Style in the Façade of Residential Buildings in Tehran

Hedieh Adeli[a], Behrouz Mansouri[b]*, Reza Afhami[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 Art Research, Tarbiat Modares University, Tehran, Iran*

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Research Article

Abstract

A specific social group causes complex differences in the way of looking at environmental transmitters, and this has made understanding the beauty, meanings and interpretations of signs dependent on their way of looking. Effective factors are effective in shaping urban facades, which have a direct impact on the designers, employers and residents of these buildings. This research has been carried out with the aim of extracting and measuring the effectiveness of the effective components in the beauty of buildings in Tehran. This research has a combined qualitative and quantitative approach, which first extracts the effective components in the design of facades from the theoretical literature, then begins to reduce the data in the ATLASTI software to refine the variable, for this purpose, a semi-structured interview was conducted with 28 expert panelists. It takes place after extracting coding, it enters the stage of axial coding. The results obtained in the qualitative phase are compiled in the form of a questionnaire and randomly distributed among three groups of employers, designers and experts for the intensity of the effect. The comparative results between these three groups were obtained with inferential statistics in JMP software. In the end, for the degree of correlation between the responses and the semantic differentiation of these groups, a graphical correlation is taken in the ORIGINPRO software. The results show that in the group of employers, the components of the type of materials, non-use of unusual and unfamiliar forms, age, objective image of the facade value of (1.000), the highest factor share is related to the component of using washable materials with the value of (0.254). In the group of designers, the component of not using unusual and unfamiliar forms, age, flexibility in execution, symmetry and rhythm with a value of (1.000) and the least related to gender with a value of (0.355) in the group of residents, the

* Corresponding author. +98-09121011121.
E-mail address: Beh.Mansouri@iauctb.ac.ir

component of age, communication and proximity with value (1.000) and religion is the least related with the value (0.381).

Keywords: Effective Factors in Façade Design; Tehran Residential Buildings; Mixed Method

1. Introduction

One of the most basic architectural elements involved with the urban space and the audience is always the view of the buildings that are located in the urban body and are located in direct and direct connection with the urban environment (Dadashpoor et al, 2022: 104). The developments of the last few decades, both in materials and variety of styles and due to the speed of construction, caused the need to pay attention to the view, coordination and organization of urban views (Atard and Kashi, 2017, 186). The external appearance of the building is considered as the basic element of the urban body and it has a significant importance in the formation of the body of the city. The disturbance and disharmony discussed in the architectural facades are related to all the spectrum of buildings, but since residential buildings are considered to be the dominant existing buildings, therefore the discussion of this research will be focused on this category of buildings (Shahbazi et al., 2019: 137). Housing is known for its importance as a space where people spend most of their time. Today, most of the attention paid to this issue has been focused on the issue of plan (Ghasemi, 2022: 104), but we know that the facade, as a facet of the building, has a significant impact on the mind of the audience, which in the interaction between inside and outside, psychologically, or causes peace and or it causes tension. As an allegory, view as Clothing and covering is the appearance of a building that represents the character inside and should be in proportion to it (Imani and Zafarmandi, 2016, 39).

Over time, this procedure is demonstrated from the inside to the outside and the house finds an urban procedure and tends to have an urban effect. The meeting point of the architect and all its teachings, thinking and theoretical knowledge with the style of the people is always one of the challenging points in the path of architectural opinions (Qasemi et al., 1401: 38). This issue is most important in the field of residential architecture. It reveals as the most exclusive choice of people in the field of architecture (Kasravi, 2016, 9). On the other hand, the maximum speed of housing construction in the last few decades and its growth in the vertical direction has basically not provided designers and experts with time to think and deal with the facade (Momeni et al., 2019: 19-21). In addition to this problem and the problems mentioned above, the lack of attention to the external signs of housing architecture that existed in the past, in addition to the dynamism of destructive thoughts such as showing off, boasting and luxury for the purpose of competition, is an alarm for the appearance of the residential building with the theme that it is dominated by them. Appearance is far from fulfilling its role (Torabzadeh, 2014). The plague that we refer to as "alienation of appearance and meaning" is proof of this in residential buildings in the city with different procedures that rarely convey the feeling of home to the observer (Vahdat and Rezaeirad, 2016: 77-84). In fact, with a close look at the appearance of the city, we see the inconsistency and myriad colors of the facades of the houses. Even in some cases, we can see views that have replaced strange and unfamiliar concepts in the mind of the audience, regardless of local culture and past urban identity, which have nothing to do with the concept of life (Scruten, 2006). The evidence shows that today, with the growth of population and immigration and the consequent increase in human needs for various uses, and with the advancement of technology and the speed of construction to meet the needs, a huge flood of multi-story buildings emerging from the ground.

Such extensive construction and the need to implement a shell on the body of each of them has caused maximum diversity in the field of facade construction (Imani and Zafarmandi, 2016: 36). This diversity is influenced by factors such as: design context, culture, economic goals, audience's style, designer's opinion, executive laws and reasons like that, and the facade is designed in the conflict of these factors. A problem that is a significant concern of many experts and urban designers today (Janipur, 2006). The social distinctions caused by the disparity in the cultural and economic capital of the citizens, along with the disorder and mismanagement of the city, have created the ground for the architects and designers of urban facades to shape the visual appearance of the city of Tehran in line with the style and style of the citizens, which unfortunately results in a chaotic appearance and disorder (Mohammad Hosseini et al., 2018: 39). At the same time, the architectural and urban planning community can provide the conditions by relying on its expertise and artistic vision to design a visual image while respecting the social capital and style of the general citizens from different strata of the society to preserve the identity and sense of belonging. to improve the quality of architecture and urban planning among the citizens in terms of the visual image of the city (Maudti, 2013). Some people think that dealing with the facade of the building is a personal matter and based on individual style, and some consider facade construction as a useless and luxurious work (Nasar, 1994). This research, with the aim of exploring the difference in the factors affecting the design of the facade by the three main groups of employers, designers and residents, tries to answer the question of how much the factors have a difference in factor share in different user groups.

2. Theoretical Framework

2.1. Style in Architecture

Every person's style is subject to various factors such as family upbringing, friends and neighbors, the general culture of the society, and in a general view, its surrounding environment (Danaci and Kiran, 2020: 231). Style does not exist in an absolute form and mixes with the environment of society in a back-and-forth process. If a person lives in a healthy and free environment psychologically and culturally, we can expect that its response to the society in the form of style will be indicative of its true desire and the result is that he is a reliable person; However, if the environment of the society does not have the necessary health and stability, according to the majority of sociologists and psychologists, it cannot be made to the style of the citizens (Esmaili et al., 2019: 72). Also, if the cultural environment is unstable and unhealthy, it will have a direct and indirect result on its cultural-identity actions, of which architects are also an integral part of it (Attia et al., 2020: 23-42).

2.2. Relationship between Architecture and Citizens' Style

One of the challenging points in the architectural design of buildings, which has always been considered as the meeting point of architecture and the teachings of architects, is the meeting of the thinking and knowledge of architects with the style of their audience (Bagheri et al., 2020: 12). Understanding style and its relationship with the audience on the one hand and with society, on the other hand, is one of the requirements of these people's architectural approach to the issue of style and aesthetic tendencies of the audience (Yammiyavar and Roy, 2019: 313).

Aesthetic style or judgment is not an inherent gift, but a kind of social ability that has different levels of aesthetic understanding and as a result, people enjoy a different culture of style, which is

reflected in people's cultural choices (Calleri et al., 2018: 78-95). The choices appear to be formed based on the values arising from the social assets of individuals, but in reality, are influenced by factors outside this range and gradually turn the distinction between social classes and social groups into the culture (Hollander and Anderson, 2020: 219).

As an eternal and obvious choice, architecture reveals the aesthetic tendencies and style of people. It tries to help people of every culture and style to express their style standards with architectural answers, far from mechanisms based on excessive profiteering that leads to the dominance of one style and the marginalization of other styles (Bagheri et al., 2020: 19).

2.3. Relationship of Style in Contemporary Iranian Architecture

Iranian architecture is a story of how two eastern and western cultures meet. What is important is that society has the same structure and body. It is these structures and bodies that create a kind of social domination and the architect, by knowing the beliefs of the people and connecting with them, and getting to know the elites' point of view, rises to fight against social determinism and symbolic domination (Zarifpour Langroudi et al., 2019: 217-232).

This is where the culture of each class is separated from the forms of competition between classes and their struggles in symbolic fields and forms the symbolic forms of classifications. It gives them an identity. This causes every person in society to look at architecture to measure, style, and desire to build; in such a way that the first word in contemporary architecture is "being different" (Momeni et al., 2019: 15).

The response mechanism to such thinking creates a phenomenon called fashion, and this is what theorists such as "Georg Simmel", "Norbert Elias", "Vance Packard" and "Pierre Bourdieu" refer to as "fashionable" (Haghighi Nia, 2014: 3). This thinking is based on the premise that the members of a certain social order, based on their specific social, economic, and position in society, possess goods and identify themselves with them. Here, the role of the rich class in determining what is beautiful, tasteful, and desirable is noticeable. "Thorstein Veblen" describes the spread of the styles and norms of the rich class in all social classes (Shidane et al., 2014: 124).

Table 1 Influence of Iran's contemporary cultural transformations on Iran's architectural transformations (Source: Authors)

Macro spheres of influence	
The transformation of thought foundations	• To forget and destroy everything related to the past. • Defiance of the humblest beliefs and ideas against the most original ones • Wandering and fluctuating Iranian society between the two poles of tradition and innovation • Production of urban cultures in opposition to each other and interact with rural cultures (production of urban subcultures) • The tendency of the middle class to imitate • Production of examples of architectural indicators in closed-minded conditions.
Interaction with models and versions of the western world	• Globalization of all issues related to the city and architecture • Measuring everything with the West (good or bad) • Losing the connection of architecture with its past and following global styles and trends • Spreading and establishing the foundation of imported architecture, paying attention to the cultural capacity of our country (receiving the product of Western civilization and neglecting the production process in that context)

Changes in the face and tone of architecture	• The introduction of architecture from the concept of goods and not a place of life and the city as a warehouse of goods and not a bed of civility • Converting Iranian architecture as a single identity to architectures in Iran or other words "multiple identities" • Applying the architect's styles or following the wishes and styles of the client • Rationalism and trying to create a work that is different from the surroundings (not paying attention to the urban space in the form of fashionism and diversity in the facade)
Ideological confrontation and interaction between the government and the people	• The visionary ruling the society, the government, and the people always follow it (until the 1960s) • Dreaming of individual people in confrontation and conflict with the dream of sovereignty (from the 1960s onwards) • Mismatch of cultural predictions in planning what happens during the program (unfamiliarity with social changes). • Propagation of the accepted culture of governance by centers of thought production and culture, addressing and expanding quantitative issues, narrowing the field to qualitative issues.

2.4. Importance of Façade in Architecture and Urban Planning

The city view consists of city buildings. Undoubtedly, the facade of each building is influential in the city complex in which it is present. In fact, the view of the buildings appears as a screen of architectural compositions. Architectural compositions contain a kind of meaning that can stimulate the human imagination and communicate with him. This is the reason why a major part of human communication with his surroundings happens through his visual and mental communication with the architectural compositions of that environment. This communication has a very abstract character that provides the ground for stimulating non-abstract and more specific communication (Khakzand and others, 2013: 16). In other words, architects produce "cultural capital" with their work, and cultural capital affects the level of citizens' analysis of the surrounding environment, skills, colloquial language, and their perception of aesthetics, and the result is the cause of inner desires. And their symbolic wealth is evident in the field of life in the form of character, legitimacy and recognition (Shayan Mehr, 2018: 24).

On the other hand, the developments of recent decades in the landscape of cities caused the development of rules and regulations for the organization of urban views to be considered. Today, identity, disorder, and visual disturbance can be considered as one of the most important criticisms of the landscape of cities. In this context, the dimensions to be considered in the examination of all examples and scales used in urban design can be considered to include the following dimensions:

Facade in building construction has a high visual and social importance. In fact, the facade can be considered the social aspect of the building and the language of dialogue and its interaction with the surrounding space; Also, one of the other reasons can be considered to beautify the appearance and exterior of the building and, as a result, the quality level of its residents; This is the reason that in recent decades, with the importance of finding the value of urban life, the facade has also received the attention of designers and citizens.

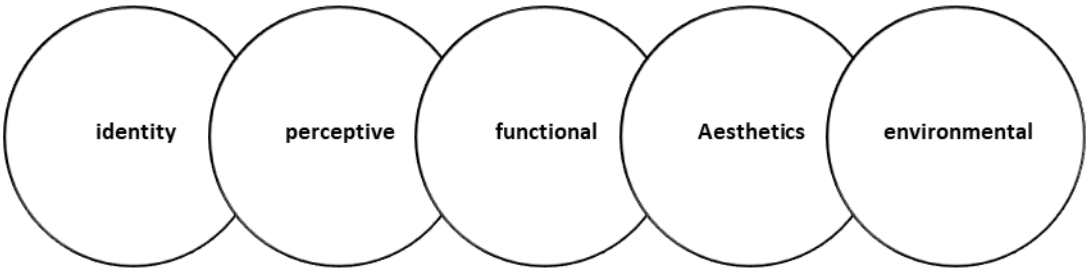

Fig 1 Dimensions of interest in the scales used in urban design (Source: Khak Zand et al., 2014: 17)

In urban spaces, the façade is considered as the enclosing body of spaces. Every view in urban spaces has two important roles:

A part of the architecture enclosing the space

A part of the order governing the urban space

Actually, the facade is a curtain that separates the inside and outside of the building from each other; For this reason, it is considered a two-dimensional element:

- Individual dimension
- Social dimension
- Each building has four facades, which are:
- Facing or facing the urban space (main front or facade)
- Back view

the other two facades are called the sub-front of the building if they are not connected to the surrounding fabric.

"Kevin Lynch" in an article entitled "In the city" defines the criteria for determining a good look and appearance of the city, based on psychology, which are: "excitement, variety, capability, memorability, vitality, identity, imaginability, readability", flexibility, simplicity, clarity, dominance, a part of the form, compatibility with the environment, meaningfulness and educative" (Keshir and Shoshchian Moghadam, 2019: 48). Urban views are a combination of different components that are formed based on the events that happen in the streets and passages.

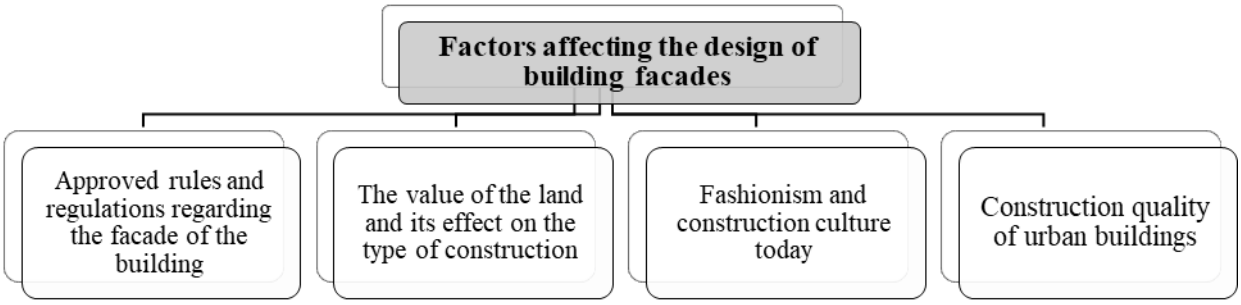

Fig 2 Effective factors in the design of the facade of residential buildings (Source: Keshir and Shoghchian Moghadam, 2019: 48)

2.5. Factors Affecting the Design of Urban Façades

a. Construction Quality of Urban Buildings

Examining the approaches in the field of the quality of construction of urban buildings shows that the existing theoretical approaches regarding the discussion of quality in the construction of urban buildings can be classified into two general categories: "Physical Design Approaches" and "Social Approaches". The point of distinction between these two forms in dealing with the category of environment quality and mental-behavioral components governing the society can be found among architects and employers and the style of citizens (Jolodar Karimi and Jahanbakhsh, 2015: 12-13).

In general, architects do not play a significant role in the architecture of private buildings and are influenced by market demand and fashion. It can be acknowledged that the style of imitative architects is among the traditionalist, modernist and modernist styles that the general public tends towards. In this way, mere imitation of Western architecture, both in the field of meaning and in the field of form, is considered the only way to create a new space. According to the architects of this style, meaning is not actually created, but a new meaning is imitated and injected. These groups penetrate the general level of Iranian architecture with an economic and entrepreneurial view of architecture, which they consider as a complex business (Haqqiniya, 2015: 11). The real architect and designer will never be willing to turn their backs on all their knowledge, thoughts and ideas and agree to the design and construction of any view in order to respond to the immature and fleeting tastes of the moment, which is also the result of the work of the architects themselves (Shariat Razavi and Kasraei, 2011: 122). Among these are architects who give in to the demands of employers and abandon the original meaning of architecture.

"Pakzad" writes in an article entitled "Phenomenology of the facade of residential buildings and the evolution of expectations from it": "In western architecture, the facade has a mode of presentation, so that it shows the person who lives behind it in the first place. Everything represents the sign and family character; Everything shows the social class and ownership of the owner of the house".

The style and desire of the employer is another very determining factor in the architecture of private buildings, which depends on the level of his economic possibilities. Each stratum of the society has its own way of looking at architecture and architectural logic, which forms its architecture along with its financial situation. The architectural logic of a rich man who has acquired his wealth by chance and is devoid of the characteristics of a born rich man is the logic of a general anarchist, only on a larger scale. He tends to display the material aspect of what he builds and is proud of this aspect of his building, so he pays a lot of attention to its artistic dimension, volume, appearance and materials. The architecture of a person who is familiar with the principles and beauties of ancient, traditional or western architecture, but his hand is empty with the architecture of a wealthy person who is unfamiliar with the aforementioned principles and only to make himself aware or pure imitation in the thought of splendid construction and at the same time influenced by the architectures It is mentioned, there is a difference (Haqqiniya, 2015: 12), and since the employer has money, no one can object to him that he does not have the authority to act (Hashmi, 2013: 19). And finally, some architects sell their work before completion; Selling something that does not already exist externally will put the architect in a situation where the client will have the ability to interfere in any way (Afshari Nadri, 2013: 7).

b. Fashionism and Construction Culture

One of the most important psycho-social factors that affect our aesthetic sense is the ruling cultural model. For example, we can mention the fashion or style adopted at this time (Pakzad and Homayoun, 2018: 113). Beauty at the level of fashion and a little less at the level of style is partially and relatively subject to specific subjective factors. At the level of fashion, the concept of beauty can change in the shortest period of time (Vaazi, 2011: 37). In recent decades (2005-2019), people followed fashion to a great extent and it was very important for them. During this period, architecture also became subject to fashion to some extent and their dominance became wider day by day. It was during this period that the use of classical and neoclassical style architecture in the facade of buildings was seen in a short period of time in the opinion of the wealthy stratum of the society and became widespread.

c. Land Value and its Effect on the type of Construction

The amount of people's financial power has shaped the architectural quality of their buildings and has been one of the key factors that determine their architectural type. In the past years, due to various reasons, a new social class has emerged, which is seriously facing the crisis of unbalanced class promotion. A crisis that originates from imbalance and suspension. This means that this class did not have the necessary social and cultural contexts for this to happen, as economic growth has led to its class advancement, and it suddenly found itself in a situation that was very different from its previous situation and was inevitably in a situation has been forced to take a defensive position. A position that can be seen in many behaviors (Lanjovani, 2011: 111). The defensive stance of this emerging class is pride, which sometimes manifests itself in social behaviors, sometimes in details such as the shape of cars and houses, etc. This craving that some of our people show for a certain type of luxury in today's urban life is of the same kind of insistence to stabilize the position; But the insistence of this emerging class on boasting makes them fall into trivial examples of luxury. Examples that can be encountered in the architecture of some buildings in some special neighborhoods in the city of Tehran. Carving a large and terrifying volume of stone using medieval architectural styles is nothing but a hasty and trivial treatment of luxury in architecture (Vaazi, 2013: 37).

d. Approved Rules and Regulations regarding the Building Façade

In the formation of any suitable architectural design, there are two very important factors, one is compliance with the principles and rules and regulations, and the other is the artistic style of the architect. The design of the facade as an external shell and a factor in showing off the building can show the peak of the architect's artistry. Wherever there are more and stricter rules and regulations, the possibility of individualism and personal style of the architect will be less and vice versa.

There is no doubt that the lack of adequate regulations and the procrastination of decision-making organizations of the urban landscape in all these years have created a long opportunity for the power of the creators of Western classical and neoclassical styles. Until 2008, when for the first time in the approval of the Supreme Council of Architecture and Urban Planning, the discussion of the facade and the need to pay attention to it as a visible element in the main thoroughfares is considered. The facade and urban landscape are considered a vague and neglected point in comprehensive and special plans. With the proposal of this resolution, which was compiled and approved by the highest decision-making authority in the country's urban planning field, all relevant

institutions, including the engineering system organization and municipalities, are obliged to draft a bill and executive regulations in a five-year period to improve the quality of TV and urban landscape. In Tehran, Nama Committees in the Vice-Chancellor of Architecture and Urban Development, as well as at the level of regional municipalities, started to operate as a pilot in several regions, from the end of 2010, and until December 2012, and near the end of the mentioned deadline, the bill was sent to the city council, but it was approved by the council. The city and the commission have not reached Article 5. (Rizvani, 2015: 62). Although the nascent facade management committees have followed their role seriously in the last year, in several areas of Tehran, with the goals and indicators set in the modification of the existing urban facades, there are still defects in the issue of executive guarantee. and legal, including the reference to the Article 100 Commission, the very weak presence of the Engineering Organization and competent engineers, designers or supervisors in the design to construction process, the postponement of facade control to the stage after receiving the building permit, the lack of incentive policies for projects with an Iranian identity, and most importantly Not taking issues such as citizenship education, promotion of general knowledge and aesthetics and functional efficiency of the relevant devices that were formed with the purpose of organizing the urban landscape down (Haqqiniya, 2016: 11).

Table 2 The main points extracted about the facade of the building in the nationally approved laws

Law	**Important points in the review of the law regarding the image and urban views**
Facade rules in cities	Considering the minimum necessities Limited design in the form of surfaces visible from the passages, not including all public spaces No restrictions on materials for specific sections Not using specialized vocabulary Connection with other urban planning laws, lack of connection only with the theme of façade
Islamic urban planning rules in the preparation of urban plans	Continuous study about cities and Islamic architecture of the past and present of Iran and the world Compilation of design principles and rules based on Islamic standards and requiring consultants and engineers to comply with them Not mentioning different urban areas, historical cores, middle and new developments or new settlements. The title of urban design in legal literature (Nama) for the first time
Paragraph "B" of Article 137 of the Law of the Third Program of the Development of the Country	Qualitative change in the use of specialized vocabulary: identity and identity giving, the appearance of cities (the appearance of urban facades), architectural culture and native urbanism. Paying attention to the scale of the image and body of the city (cities and villages) Pointing to the features of local architecture and urban development and preventing the destruction of valuable buildings and bodies Outlines, definitions, general rules, executive organization and revision The approach of providing health and well-being, creating suitable living conditions, increasing social interactions and regulating the flow of civil life
Rules and regulations for improving the quality of TV and urban landscape	Upgrading the quality of the image and urban landscape, cleaning and improving the existing facades, adapting sidewalks and sidewalks, and organizing the public spaces of the city (façade materials, urban furniture, vegetation, urban facilities, signs and functions) Paying attention to existing textures in parallel with future developments and new cities Presenting construction and facade construction criteria in the historical part of the cities for the first time

	Designing responsibilities for urban management without defining executive duties for municipalities Creation of the "Committee for the Quality Improvement of Television and Urban Scenery" under the Secretaryship of the Housing Organization with the aim of coordinating between urban management institutions
Rules and regulations of cultural heritage related to the issue of urban views	Instructions for preparing special plans for historical context Emphasis on "texture unity", "texture connection and natural environment", urban identity, "respect for scale", "architectural form and urban patterns", "open and green space", "sight and landscape" Failure to define executive duties for municipalities and cultural heritage organizations Supervision of the implementation of protection rules for buildings, collections, sites and historical contexts by councils Assisting, participating in the beautification and safety of cultural spaces, textures, historical works of the markets by respecting the characteristics of historical textures. Lack of seriousness in introducing the law enforcement supervisor

2.6. Façade Components

The elements that are known as the elements of a view form the whole and the main shape of that view.

"Rob Carrier" says about this: "Façade elements are either functionally necessary or they are simply reliefs that give soul to the exterior" (Zarifpour Langroudi et al., 2019: 219). The indicators of proportions, cleanliness, balance and order in the "objective dimension" and attachment to the place, meaningfulness, calmness, readability and attractiveness in the "mental dimension" are in the priority of evaluating the beauty of the facade (Khakzand et al., 2013: 15). Analysis of the shapes and proportions, color, materials, decorations, age and style of the facade of the desired building is a researcher. The problem in architecture is the same figure, shape and body; In other words, independent boundaries that can be clearly identified on the building surfaces. The overall problem of the facade is its main divisions that create smaller shapes, the shape of windows and frames created for smaller decorations are the types of shapes studied in the field of building facades. The proportion of their dimensions to themselves and to each other is another issue that forms part of the beauty in architecture (Kasravi, 2016: 9-10).

Table 3 Requirements and actions around the most important elements in the facade of the building

Elements	requirements (don'ts)	Actions (shoulds)
Form, materials, colors	1. Prohibition of using all-glass or all-metal facades 2. Prohibition of using unusual and heterogeneous colors on the facade of the building 3. Prohibition of using multiple materials (up to 4 types) 4. Prohibition of using unconventional forms in building design and construction 5. Prohibiting the use of sharp or fragile materials in the area of the building that is exposed to human physical contact. (ground and first floor)	1. The necessity of using durable, long-lasting and resistant materials against erosion and pollution on the facade in axes, passages or special buildings 2. The need to coordinate the dominant color of the facade with the color of the neighboring building 3. Covering the gap between two buildings with materials suitable for the facade

Attachments of installation elements in facade and panel	1. Prohibition of design and implementation of facility elements in a visible way on the main and side facades and urban walls of the building 2. Prohibition of writing on the facade of the building in excess of what is allowed in the approved facade plan. 3. Prohibition of using signs and symbols of anti-cultural and anti-religious thinking on the facade of the building	1. Institutional elements, including mechanical, electrical, etc., must be designed, implemented and installed in a part of the building that is not in public view. 2. The place of the sign should be designed during the design of the facade of the building.
Protrusions and openings	1. It is forbidden to create any level difference in the lower level or the ground line in the facades such as edges, stairs, platforms, etc. 2. Prohibition of creating any protrusion of the entrance space in the public thoroughfare 3. The adjacent limit of protrusion of elements such as window edges, cornices and permitted frames in the public thoroughfare space should not exceed 10 cm. 4. Prohibition of using openings with unfamiliar and different geometric shapes in the facade	1. The entrance area of the building should be legible and designed in accordance with the other components of the facade. 2. In order to prevent water from sliding on the facade and causing stains, measures such as cornice should be provided for the bottom of the windows.
roof	1 Prohibiting the use of installation elements on the roof without proper covering in such a way that it can be seen from side passages.	1. The front line of the building, its protrusion and the level of the roof should be in harmony with the neighboring buildings. 2. The form, facade, color and dominant shape of the roof must be in harmony with the architectural features approved by the municipality. 3. Measures such as drippers for the roof should be taken into account to prevent stains caused by water sliding on the facade.

2.7. Architects' point of view in Building Façade Design

The facade of the building is an important part of the micro landscape, which has a great impact on the aesthetic perception of people towards the urban environment around them; for this reason, it is necessary to pay basic attention to it in the process of designing and producing an architectural

work. In fact, it can be said that each of these works is the result of the thinking of architects and designers with different mental patterns, the result of which is the formation of the visual identity and identity of the city (Jem et al., 2019: 141).

The opinion of the architect in relation to the design components of the facade from the aesthetic aspect, indicates the mental patterns of the architect and the role of his tasks in the direction of giving identity to the urban appearance. This mental-theoretical model based on obvious and conscious principles organized in the architect's mind reaches the emergence stage in the form of the final plan and becomes a real thing and forms the tool language of an architect (Rizvani, 2015: 62).

2.8. Applying the Role or tyle of Citizens' in Façade Design

Applying style in the facade of today's buildings has no meaning; But at the same time, designers, builders, sellers, and contractors must be responsive to the current fashion and common style in the market and desired by citizens as customers; In fact, the conditions governing the housing market oblige the architects to satisfy the employers and not stay away from the competitive housing market, forcing them to be artistic and creative in designing the facade of the buildings. In this way, the owners, contractors and builders are looking for the index of their buildings and to satisfy the customers, and the customers are also looking for residential units that, in addition to being compatible with their economic and financial situation, show their personality (Shidane Merid and Sarmi, 2014: 6).

In other words, it should be said that nowadays the facade has gone beyond the interface between the outside and the inside of the building and is considered as the second clothes of people. Just as people's clothes represent their personality, they also consider the facade to represent the personality, dignity and social status of the owners and residents of the building. In western societies, the facade has a dramatic aspect and is a sign of the family character, social class and ownership of the owner of that building (Rizvani, 2015: 62).

3. Research Method

The current research method is applied in terms of type, and in terms of the type of method, it has a nest-to-nest combination method. In order to answer the research questions, nest-to-nest research method of qualitative and quantitative type is used. First, in the study section, a systematic review of the main variables of the subject is done, after extracting the variables and creating a conceptual framework, it is tried to refine the variables according to the case sample using the Delphi method by experts. In the qualitative sampling of the current research, first of all, 28 experts who have complete knowledge on the design of residential buildings facades and style will be selected as a snowball. Opinions will be asked from them based on the use and possession of existing factors and components related to the subject.

Then, in the quantitative stage, the effective components in the design of the facade of the buildings obtained in the previous stage of the questionnaire with a Likert scale are compiled and provided to the users of the space randomly. The statistical population includes designers, employers, and residents (space users), and for more validity, the sample size taken from the upper limit of Morgan's table, which is 384 people, is used. ORIGINPRO and SIGMAPLOT software are used for ease of analysis with inferential statistics. Finally, based on the results, the correlation between the variables in the group is taken with the other group. The validity of the questionnaire using the CVI formula is 0.76 and the reliability using Cronbach's alpha is 0.75.

Table 4 Case studies

Facades number 1	Facades number 2	Facades number 3	Facades number 4
			
Facades number 5	Facades number 6	Facades number 7	Facades number 8
			
Facades number 9	Facades number 10	Facades number 11	Facades number 12
			
Facades number 13	Facades number 14	Facades number 15	Facades number 16
			

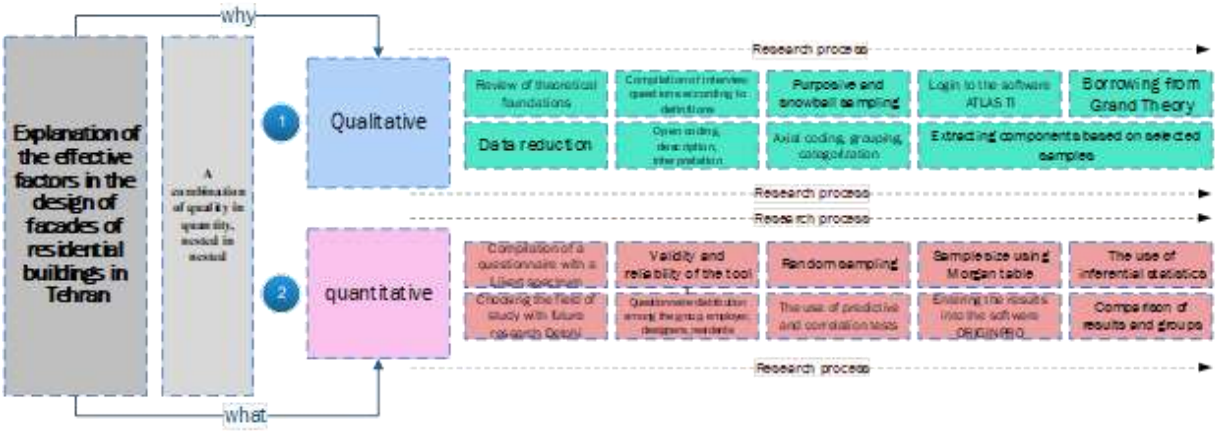

Fig 3 Diagram of the research process

4. Research Findings

4.1. Qualitative Findings

Open Coding

At this stage, data has been collected, reviewed and looked at from various angles many times. At this stage, the researcher tries to recognize the hidden concepts by reviewing the collected data set. At this stage, semi-structured interviews are conducted with 20 experts and architects, and this process continues until theoretical data saturation. For each set separately and briefly, a short summary of the conducted interviews is given, and the output of the software is placed in the form of a diagram.

Table 5 Examples of statements taken from the interview text and excerpts

Persons	Propositions taken from the text of the interview and interpretation
Abdul Reza Zakai University architecture professor and author of the book "Memaran Iran".	The relationship between people's style in the construction of residential buildings and the flow that architects direct is completely two-way. On the one hand, architects can impose their ideas and thoughts in the field of architecture on the people, and on the other hand, people can play a role in guiding this flow with the lifestyle and patterns they choose for their lives. If we look at the architecture of the buildings of the past 50 years, the element We can clearly see the elegance in their design. Iranian buildings must have Iranian authenticity and be designed based on Iranian style and spirit. In my opinion, Tehran is one of the ugliest cities in the world, while it could be one of the best cities in terms of architecture and urban planning. One of the prominent and important issues among the people of any land is the place of life and the spirit governing the lifestyle of its ancestors.
Mohammad Salari, Chairman of the Urban Planning and Architecture Commission of Tehran Islamic Council	Since in the past no supervision was applied on the facade design; This issue caused every owner or builder to design and implement the facade of the building according to their style and conditions. The consequence of this issue is that it has led to disturbance and chaos in the landscape of the country's cities, especially Tehran. In Nama

	committees, there should be an open space for people, trustees, and city watchers to participate, and the approach should be to realize the public rights of the city. This is despite the fact that sometimes decisions are issued in facade committees that are style less and have no basis, and this has caused previous architectural creations to be lost. Therefore, this is one of the serious problems in this department.
A member of Arkoverjavand engineers' group	The design of the facade of a residential building is an important point that should be paid special attention to because the first thing that attracts attention when entering the building is the exterior of the building. Note that the exterior of the building, if done correctly, will increase the quality and material level of the building, and in addition, if the exterior of the building is beautiful and special, it will be recorded in the mind of every viewer as a memorable work. The facade of the building also beautifies and increases the life of residential buildings. In the design of the facade of any residential building, different materials such as stone, brick, glass, etc. can be used.
Mohammad Mehdi Abedi Urban designer, university lecturer and scientific member of the facade committee of the 2nd district of Tehran Municipality	It is very interesting to know that it is still not clear, or at least I do not know, what happened when Roman and classical facades entered Iran. Of course, the interesting point here is that many believe that this facade is the product of the Iranians themselves; Or according to one of the professors of the committee of the view of the regions, the Romans themselves call the Roman view the Iranian view! Because you don't see in developed countries that they use Roman or classical facade proportions for residential facades - especially dense residential facades. Because they have different expectations from a residential facade. However, there are some Iranian designers and manufacturers, especially in Tehran, who know the market's style well and take the initiative and take the market's style into their hands. We have a set of expectations from the facade of every building. For example, you expect the facade and architecture of a cultural building to show that it is a cultural building. Or do you expect an office building to be clearly office. The same is true for residential facades. We expect a residential facade to show peace, intimacy, people, etc.
A member of Naqsh Shahr Consulting Engineers	To design the facade of a building, you can use all kinds of classical, modern and Iranian facades, and the choice of each of the external facades of the building is a matter of style. Choosing materials for the facade of a residential building is one of the most important principles of facade design that should be taken into consideration. The condition to achieve an ideal and beautiful facade is to know what materials we should use next to each other so that the exterior of your building looks special and stylish. In general, in the design of the facade of a building, variety of colors and variety of textures are very important, and you can achieve a beautiful and suitable building facade by choosing the right materials. It is better to design the facade of a building in such a way that, despite being special, it is in harmony with the neighboring buildings and the lines and lines of facades in that area can be seen in the design of the facade. In the design of the facade, the culture and texture of the region should be examined before designing. Then the results of the investigations are combined with the creativity and art of architecture to reach a desired and desirable result.
Deputy Director of Civil Affairs Coordination in Tehran Province	This is despite the fact that the use of dangerous facades such as glass facades and stone facades, which are very dangerous in the event of an earthquake, and Roman facades and facades inconsistent with Iranian

	and Islamic facades are also very common, which also creates a visual disturbance in the city. The appearance of the buildings is so chaotic that in many facades, even the smallest technical inspection and supervision has not been done in their implementation, or the quality of the materials used in connecting the facade to the structure has not been done, which in case of an earthquake or the passage of time, irreparable risks for others, especially for passers-by. and will bring parked cars. The trend that has existed in the monitoring of urban constructions and facades by municipalities so far has been emphasizing facade construction and obtaining a thesis based on the guidelines of the Iranian Supreme Council of Urban Planning and Architecture, and in this case, the owners and architects have acted in a tasteful manner. He said: Regarding glass or stone facades, there are percentages for the maximum use of materials, but unfortunately, architects and executives do not have strict supervision of their implementation, and we plan to monitor the execution of facades in the future by developing guidelines and forming technical committees for urban facades. to have

Axial Coding

In the next step, the extracted codes were categorized, also the codes were categorized, verified and deleted in parts. Due to non-compliance with theoretical principles 23 codes were removed. The categorized codes were based on the interpretation and description and compliance with the concepts in the theoretical literature of citizens' style in designing residential facades.

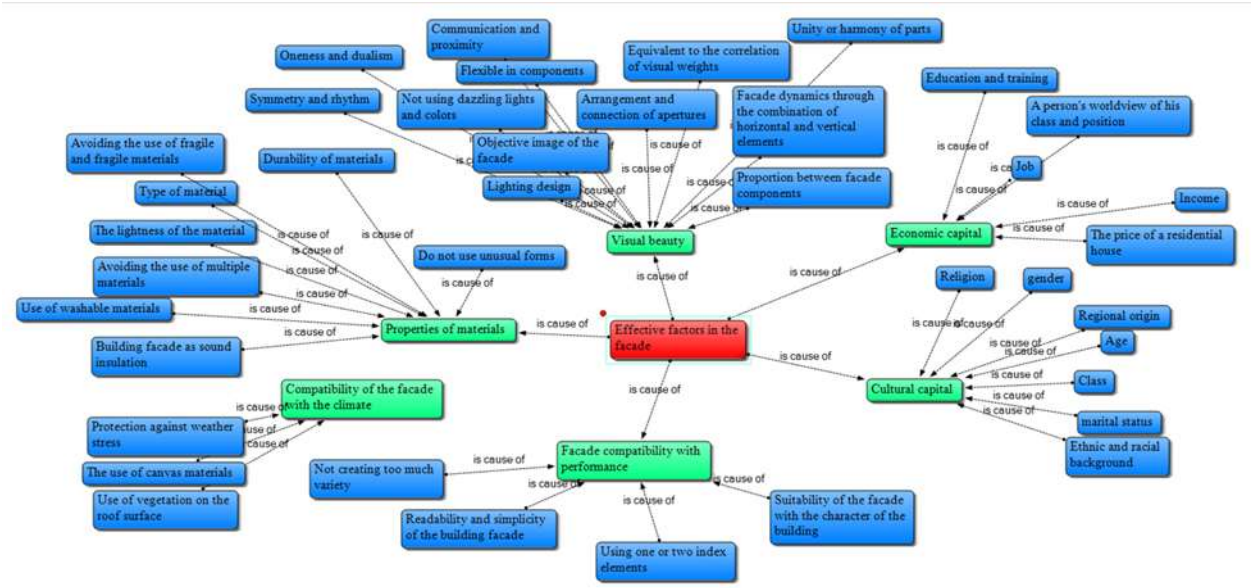

Fig 4 Axial coding and classification of conceptual codes

4.2. Quantitative Findings

Descriptive Statistics

According to the descriptive statistics, 253 people (72.1%) of the sample population were men and 98 people (27.9%) were women, and 74.4% were in the age group of 18-30 years. In this part, these analyzes are discussed according to the factors used in the effective factors in facade design. The working method is such that the question is designed according to the number of indicators of each factor (5 numbers) and each question has an answer between 1 and 5. The sum of scores of indicators of a factor means the score given by each person to the desired quality. So the score that can be obtained for each quality varies between 5 and 25. Based on this, we create categories in such a way that the people who have given a total score of 5 to 11 to a factor have estimated it poorly, 12 to 18 are average and 19 to 25 are good. The most important factors used in the frequency chart are as follows. In the group of employers, the highest frequency is related to the amount of income and the lowest frequency is related to the use of organic materials. In the group of residents, the highest frequency is related to age and the lowest frequency is related to the use of organic materials. In the group of designers, the amount of income is the most frequent and the least frequent is related to religion.

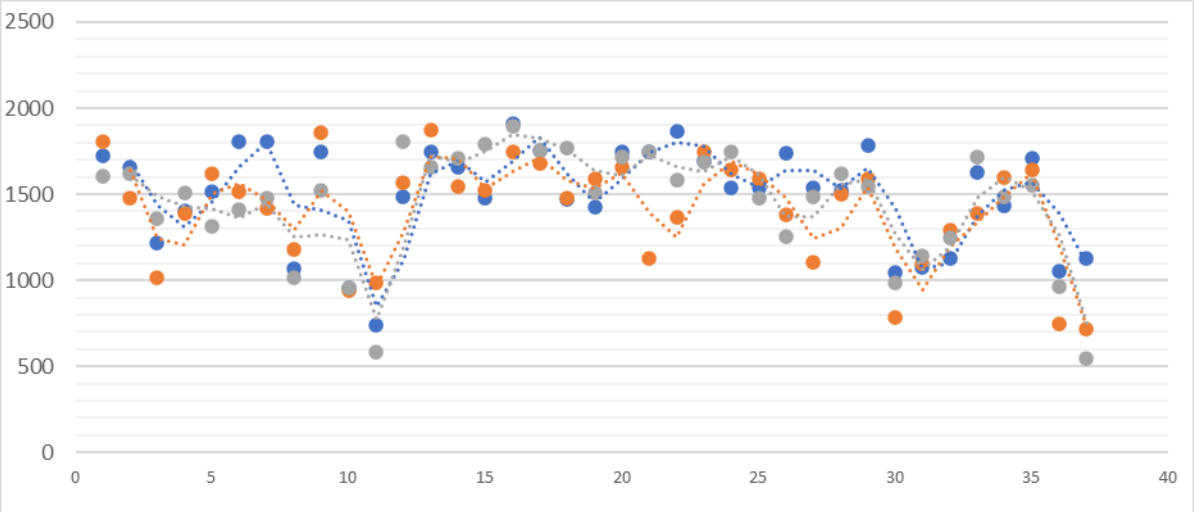

Fig 5 Frequency diagram of effective components in facade design

Inferential Statistics

In this stage, after choosing the selected variables from the qualitative stage, a questionnaire is compiled and randomly distributed among residents, designers and employers. The results are entered into the JMP software, predictive relationships (regression) and correlation relationships are used for analysis. Two-Sample Kolmogorov-Smirnov Test is used to check the parametric and non-parametric type of data.

Table 6 Kolmogorov-Smirnov test to check the normality of the effective components in facade design

variable	Mean	standard deviation	Z Kolmogorov Smirnov	p
Physical factors	27.77	23.3	0.793	0.314

As seen in Table 6, the Kolmogorov Smirnov test for the score of the effective components in facade design is significant (p=0.314) and therefore the internal and external indicators do not have a normal distribution and non-parametric analyzes should be used.

Table 7 Correlation coefficient of effective components in the design of facades of residential buildings

Dimension	Variable	employers	designers	residents	significance level
Properties of materials	Durability of materials	0.741	0.645	0.552	0.000
	Type of material	0.429	0.788	0.544	0.000
	The lightness of the material	0.623	0.913	0.741	0.000
	Use of washable materials	0.685	0.514	0.489	0.000
	Avoiding the use of fragile and fragile materials	0.621	0.749	0781	0.000
	Not using unusual and unfamiliar forms	0.652	0.656	0.418	0.000
	Avoiding the use of multiple materials on the facade of the building	0.612	0.813	0.556	0.000
Cultural capital	Ethnic background	0.381	0.625	0.745	0.000
	class	0.484	0.715	0.468	0.000
	marital status	0.464	806//0	0.764	0.000
	Religion	0.372	0.315	0.821	0.000
	gender	0.812	0.756	0.772	0.000
	Age	0.685	0.792	0.525	0.000
	Regional origin	0.597	0.755	0.917	0.000
Economic capital	The price of a residential house	0.436	0.842	0828	0.000
	Income	0.853	0.518	0.588	0.000
	Education and training	0.665	0.345	0.458	0.000
	A person's worldview of his class and position	0.213	0.583	0.518	0.000
Visual beauty	Lighting design	0.425	0.919	0.552	0.000
	The dynamics of the facade through the combination of vertical and horizontal elements	0.414	0.752	0.544	0.000
	Alignment of visual weights	0.421	0.584	0.741	0.000
	Unity or harmony of components	0.421	0.958	0.489	0.000
	Arrangement and connection of apertures	0.615	0.921	0781	0.000
	Proportion between facade components	0.424	0.421	0.418	0.000
	Oneness and duality of view	0.423	0.296	0.556	0.000
	Communication and proximity	0.454	0.821	0.745	0.000
	Flexible implementation	0.521	0.285	0.468	0.000
	Symmetry and rhythm	0.542	0.675	0.764	0.000
	No use of light and dazzling colors	0.545	0.754	*0.685	0.000
	Objective image of the facade	0.411	0.756	0.551	0.000
Facade compatibility with performance	Readability and simplicity of the building facade	0.309	0.661	0.537	0.000
	Not creating too much variety	0.517	0.874	0.747	0.000
	Suitability of the facade with the character of the building	0.517	0.265	0828	0.000
	Using one and two elements	0.607	0.727	0.272	0.000
Compatibility of the facade with the climate	Use of vegetation on the roof surface	0.619	0.331	0.826	0.000
	Protection against weather stress	0.562	0.553	0.587	0.000

Based on the results obtained from the correlation table, it is clear that in the group of employers, the highest correlation coefficient is related to the amount of income with a value of (0.853) and the lowest component of a person's worldview of his class and position with a value of (0.213) in the group of designers. The component of unity with the coordination of the components with a value of (0.958) and the lowest is related to the suitability of the facade with the character of the building with a value of (0.265) in the group of residents, the highest correlation is related to the regional origin with a value of (0.917) and the lowest is related to the component is the use of one or two elements with a value of (0.272).

Regression

To use the type of linear or multivariate regression, the internal correlation matrix diagram of the variables is used. After drawing the correlation matrix diagram, it was found that the factors have no linear relationship, so it is correct to use multivariate regression.

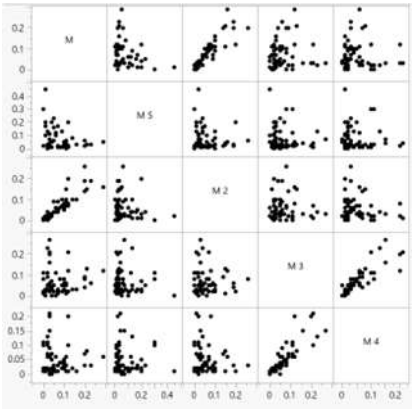

Fig 6 Diagram of correlation matrix of factors

In the group of employers, the components of type of materials, non-use of unusual and unfamiliar forms, age, objective image of the facade with a value of (1.000) have the highest factor share and the least related to the component of using washable materials with a value of (254) /0) is In the group of designers, the component of not using unusual and unfamiliar forms, age, flexibility in execution, symmetry and rhythm with a value of (1.000) and the least related to gender with a value of (0.355) in the group of residents, the component of age, communication And proximity is with the value (1.000) and religion is the least related with the value (0.381).

Table 8 Multivariate regression of effective components in facade design

	employers				designers				residents			
Variable	coefficient of determination	F	β	t	coefficient of determination	F	β	t	coefficient of determination	F	β	t
Durability of materials	0.757	501.318	0.662	852.58	0.672	245.627	0.665	231.12	0.855	175.431	0.265	581.54
Type of material	1.000	801.544	0.406	686.69	0.820	255.428	0.483	897.16	0.796	425.154	0.727	855.33
The lightness of the material	0.659	857.369	0.355	886.52	0.789	383.527	0.464	458.36	0.511	421.131	0.331	255.31
Use of washable materials	0.254	506.710	0.646	586.55	0.658	911.259	0.452	458.36	0.804	222.461	0.255	479.58
Avoiding the use of	0.974	289.658	0.262	321.83	0.815	564.243	0.463	564.24	0.684	214.475	0.275	944.61

fragile and fragile materials												
Not using unusual and unfamiliar forms	1.000	526.689	0.735	681.16	1/000	611/621	0.472	325/29	0.711	309/215	0.963	956/15
Avoiding the use of multiple materials on the facade of the building	0.569	314/278	0.881	411.59	0.895	619/872	0.661	728/25	0.811	667/216	0.588	712/65
Ethnic background	0.724	586/784	0.843	106.12	0.756	652/349	0.452	852/21	0.784	219/511	0.624	632/84
class	0.882	695/174	0.982	296.42	0.723	941/285	0.401	555/35	0.684	175/431	0.646	141/89
marital status	0.514	261/824	0.274	854.53	0.745	763/786	0.414	126/28	0.688	425/154	0.266	923/63
Religion	0.823	316/512	0.374	581.74	0.795	943/153	0.421	878/34	0.388	125/302	0.735	544/14
gender	0.676	255/984	0.921	228.55	0.355	624/485	0.421	288/92	0.711	125/423	0.881	488/21
Age	1/000	250/518	0.421	518.39	1/000	034/574	0.615	538/55	1/000	405/121	0.865	232/45
Regional origin	0.883	211/159	0.246	364.41	0.913	838/569	0.424	276/86	0.614	415/161	0.727	286/52
The price of a residential house	0.823	588/453	0.821	526.58	0.522	864/921	0.423	554/44	0.789	219/523	0.331	522/22
Income	0.607	255/439	0.285	258.62	0.685	351/582	0.454	346/22	0.455	211/305	0.425	323/16
Education and training	0.518	565/325	0.675	322.37	0.695	658/447	0.521	321/86	0.653	415/245	0.823	312/38
A person's worldview of his class and position	0.685	551/825	0.754	324.29	0.356	958/683	0.414	564/18	0.735	104/204	0.662	388/63
Lighting design	0.575	133/746	0.921	825.21	0.425	620/875	0.421	823/18	0.658	221/324	0.406	839/25
The dynamics of the facade through the combination of vertical and horizontal elements	0.874	655/145	0.421	586.31	0.706	362/325	0.421	562/14	0.589	381/584	0.355	581/21
Alignment of visual weights	0.756	325/659	0.246	566/48	0.723	382/742	0.615	566/48	0.754	388/858	0.646	456/69
Unity or harmony of components	0.581	333/544	0.524	618/25	0.689	325/675	0.424	858/23	0.684	388/644	0.262	652/31
Arrangement and connection of apertures	0.914	154/448	0.688	131/22	0.951	185/481	0.213	231/39	0.722	244/486	0.693	256/14
Proportion between facade components	0.573	183/532	0.295	522/27	0.869	365/251	0.425	877/57	0.736	175/424	0.522	854/41
Oneness and duality of view	0.747	425/186	0.855	652/85	0.661	469/815	0.414	458/63	0.758	424/210	0.365	413/23
Communication and proximity	0.581	441/139	0.742	901/56	0.581	742/251	0.421	458/41	1/000	422/178	0.652	459/76
Flexible implementation	0.744	288/458	0.922	501/88	1/000	223/541	0.421	985/52	0.792	226/544	0.625	545/24
Symmetry and rhythm	0.814	239/488	0.629	312/20	1/000	219/852	0.615	325/84	0.698	269/375	0.516	314/79
No use of light and dazzling colors	0.403	369/225	0.252	421/62	0.511	575/249	0.424	722/25	0.857	495/248	0.352	728/18
Objective image of the facade	1/000	614/255	0.982	042/13	0.542	154/254	0.423	882/45	0.399	106/225	0.745	812/25
Readability and simplicity of the building facade	0.741	366/520	0.845	255/31	0.725	288/458	0.511	121/48	0.872	614/255	0.745	0.711
Not creating too much variety	0.699	639/621	0.653	479/58	0.746	239/488	0.284	963/47	0.932	349/214	0.699	0.312
Suitability of the facade with the character of the building	0.758	981/919	0.211	982/21	0.875	369/225	0.326	0.421	0.836	698/215	0.452	0.214
Using one and two elements	0.713	183/532	0.395	134/11	0.863	614/255	0.745	0.246	0.942	214/365	0.523	0.742
Use of vegetation on the roof surface	0.544	425/186	0.211	425/24	0.792	349/214	0.699	0.821	0.711	789/522	0.842	0.752
Protection against weather stress	0.654	441/139	0.251	132/23	0.698	698/215	0.452	0.285	0.855	632/741	0.623	0.711

5. Discussion

According to the results obtained from the descriptive statistics and the difference between the results obtained between the two groups, it is clear that the components with higher frequency do not necessarily have a larger factor share. The components in the employer's group have a lower correlation coefficient than other groups. In the group of employers, economic capital has a greater share than other dimensions, and from their point of view, financial capital can influence other

factors and promote them. It has factors and promotes various factors, even though people are not in a good financial situation, but the way they look at beauty is affected. In the group of residents, paying attention to the aesthetic matter and the harmony of the ratio of the whole to the part and vice versa can affect other dimensions. In general, the stimuli in the group of employers, residents, designers include economic, cultural and aesthetic capital, respectively. The type of response in the group Employers and designers, the obtained results show that their way of looking at the factors has a lot of correlation and shows the high closeness of the results, which is displayed in the Fig 7.

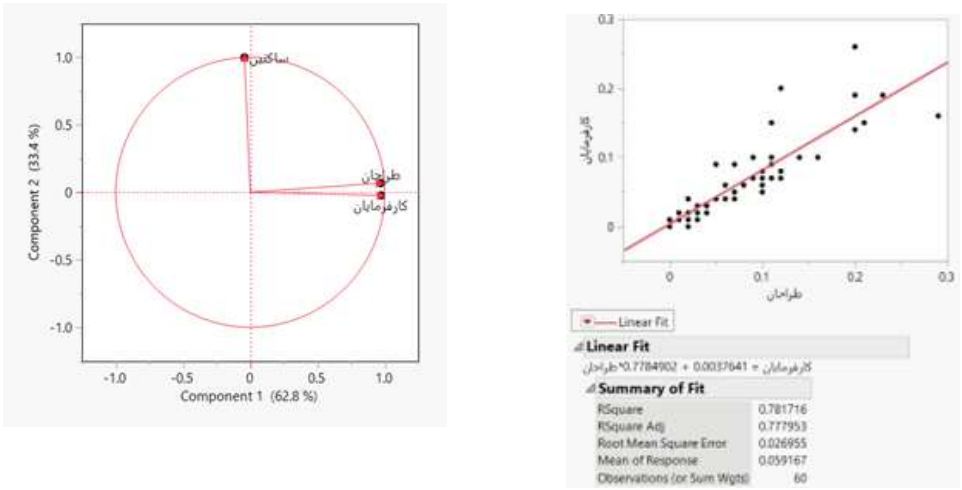

Fig 7 Correlation between factors in different groups

In the group of employers, the type of materials and the non-use of unconventional forms emphasize the economic aspect. The component of the objective image of the facade refers to the look of a product on the building and considers the facade as a cover to present the product. All groups and larger coefficients contain a combination of the two views of employers and residents, but most of them have a positive and meaningful relationship with the employer group. To considers it effective and the way of understanding beauty to be different in different ages.

6. Conclusion

The meeting point of the architect and all its teachings, thinking and theoretical knowledge with people's style is always one of the challenging points in the path of architectural design. This issue reveals its greatest importance in the architectural field of the facade of residential buildings as the most exclusive choice of people in the field of architecture. Contrary to popular beliefs arising from long-standing aesthetic approaches, aesthetic style or judgment is not an innate gift, but a social ability that is acquired through education and the process of socialization; And people have different levels of aesthetic understanding according to the social facilities and conditions they benefit from, and as a result, they benefit from a different style culture that reveals itself in their cultural choices. Choices that, although initially based on the values derived from people's social assets, are also influenced by mechanisms outside this range. In the meantime, architecture as one of the most lasting and obvious of these choices reveals the aesthetic tendencies and tastes of people. This research showed that the components are widely effective in the formation and design

of facades in various aspects, but it seems that there is a gap between the group of employers, designers and the group of residents, and the architects consider the employers as the main axis and their satisfaction as a sufficient condition for their designs. They know that while the main beneficiaries are the residents, whose views are not involved in the design, for this purpose and the closeness of the views of these three groups, the following solutions are suggested:

- Providing basic studies about the style of the users, residents and audiences of the designed buildings along with the plan submitted to the Simav Manzar Committee for approval.
- The presence of residents or space users in order to ask and answer questions with the Gutman spectrum about the beauty of the designed façade.
- Creating continuous communication through media culture and using smart systems to align the tastes of the three groups and the closeness of opinion to native Iranian architecture.
- Emphasis on Iranian facades and familiarization of people and employers with Iranian noble buildings and introduction of their physical and spatial structure.

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Screening the Components of the Sense of Place in the Residential Complex of Tehran

Hamid Rahimi Mehraban[a], Mehrnoush Ghodsi[b]*, Mahnaz Mahmoodi[c]

[a]*Ph.D. Student of Architecture, Department of Architecture, Borujerd Branch, Islamic Azad University, Borujerd, Iran*
[b]*Assitant Professor, Department of Architecture, Hashtgerd Branch, Islamic Azad University, Alborz, Iran*
[c]*Associate Professor, Architecture Department, North Tehran Branch, Islamic Azad University, Tehran, Iran*

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Abstract

In today's world, due to the increase in the use of technology and the quantification of criteria, disorders and meaningful gaps in social life, it is very important to pay attention to the quality of space and try to create a space that creates a sense of place. The existing residential complexes in big cities lack the spirit and sense of place and have become a shelter for life, which lack a sense of place in terms of perception and attention to the place and have not been able to communicate with their spatial users, this research aims to Identifying the importance of the effect of each component of the sense of place in the residential complexes of Tehran. The research method is of a descriptive-analytical and screening type, for this purpose, the dominant components in the sense of place were extracted through document analysis and library studies from articles and books, and then a questionnaire was used to examine the contribution of each component from the residents' point of view and screening. It was done in the sense of location of the residential complex of Tehran and fuzzy Delphi technique and MATLAB software were used to achieve this. The results indicate that in urban furniture, lighting with a value of 0.77 and membership degree H is the highest and trash cans with a value of 0.21 and membership degree VL is the lowest and can be removed. In the solid elements of the spaces, the elements with the value of 0.89 and the membership degree of VH are the highest. In natural spaces, the water feature is 0.85 and membership degree is VH. In the walls, panels with a value of 0.87 and membership degree of VH and doors with a value of 0.37 and membership degree of L are the lowest. In terms of landscape, the natural landscape with a value of 0.88 and the membership degree of VH and the skyline with a value of 0.21 and the membership degree of VL are the lowest. From urban furniture, trash cans are from the VL category, from the floor, the slope of the ground is from the L category, and from the

* Corresponding author. Tel: +98-9126611969.
E-mail address: mehrnoush.ghodsi@kiau.ac.ir.

natural space, the tree is from the L category, and from the windows, the doors are from the L category, and visual platforms are from the VL category, and from the perspective of depth of vision and weak points They belong to the L category and the sky line belongs to the VL category, and the quality of the color space belongs to the L category and they can be removed.

Keywords: Screening; Sense of Place; Residential Complexes; Fuzzy Delphi

1. Introduction

With the expansion of communication methods in the modern world, social relations have declined and decreased. In residential complexes, communicating with the environment and perceiving it through various senses has been degraded and has created spaces that lack the necessary efficiency and function, which, in addition to being useless, have become places that lack identity. Development in modern cities, humans has made the city and architecture unfamiliar with meaning and feeling and has created a large number of unknown and meaningless spaces. In general, the loss of the idea of the place of life can be one of the dominant crises in the present era and it causes a change in the perception of memories in the residential complexes of the modern world and turns them into a place without spirit and feeling and only a place for has been lived. In fact, these modern collections seem to have an insufficient sense of place. The impact that architecture has on the human soul and psyche in the short and long term is undeniable, the space can be from a dry and soulless and cold body to a body in which the sense and spirit of the place flows, currently in today's cities Spaces that are full of a rich sense of place are empty. In the same way, a good atmosphere has a positive effect on a person's soul and psyche and causes the emergence of identity crisis and unfamiliar symbols in large-scale cities. The interest in the sense of place has grown rapidly in recent years. And the concept of spending time has been transformed into entertainment and a wide range of programs (Stedman, 2003). The concept of sense of place is an interdisciplinary concept that is studied in sciences such as psychology, sociology, architecture, and geography. However, paying attention to place belonging has a historical background (Schultz, 2013: 52). This research is aimed at extracting the components in the sense of place and screening them with regard to residential complexes, which tries to answer the question of how many of the components in the sense of place can be effective in residential complexes and how many they can be deleted.

2. Theoretical Foundations

2.1. Sense of Place

Sense of place means people's subjective perception of the environment and their more or less conscious feelings about their environment, which places a person in an internal relationship with the environment, so that the person's understanding and feeling are linked and integrated with the semantic context of the environment. This feeling is a factor that transforms a space into a place with special sensory and behavioral characteristics for certain people. The sense of place, in addition to causing a feeling of comfort in an environment, supports the cultural concepts desired by the people, the social and cultural relations of the society in a specific place and causes people to remember past experiences and achieve identity (Falahat, 2006). In addition to physical elements, the environment includes messages, meanings, and codes, which people decipher and understand based on their roles, expectations, motivations, and other factors, and make judgments about it.

This general feeling, which then arises from the perception and judgment of the specific environment in a person, it is called the sense of place. The sense of place is an important factor in the harmony of the person and the environment, and it causes a better use of the environment, the satisfaction of the users, and ultimately their sense of belonging to the environment and the continuation of their presence in it (Sermast Metouslani, 2010). This concept covers a wide range from human entertainment and pleasure to more serious applications of life. This concept covers a wide range of relationships between people and place (Raymond, 2017), which includes the meaning of place and belonging to place (Stedman, 2003; Smaldone, 2005). According to Rolf, one of the factors in spatial semantic quality is the sense of place (Rolf, 1976: 43). Lynch sees the sense of place as a factor that connects people and places and brings unity (Schultz, 1997). A sense of place is typically associated with the connectedness of a group of people who experience a place. or feelings that people have attributed to a specific place (Cresswel, 2004). The sense of place is a subjective thing, and it changes based on culture and different experiences (Cross, 2001) and the sense of place means people's subjective perception of the environment and their more or less conscious feelings about their environment. It puts the inner with the environment. So that a person's understanding and feelings are linked and integrated with the semantic context of the environment. This feeling is a factor that transforms a space into a place with special behavioral characteristics for certain people. The sense of place, in addition to making people feel comfortable in an environment, supports the cultural concepts desired by the people, the social and cultural relations of the community in a specific place, and causes people to remember past experiences and achieve identity (Falahat, 2006). The sense of place is a mixture of self-conscious and unconscious feelings and perceptions and perceptions, a rich concept that includes how to receive, experience and express people, and gives a meaning, and a person's sense of place affects his attitudes and behavior in that place (Shamai, 1991: 347). In addition to physical elements, the environment includes messages, meanings, and codes that people decipher and understand based on roles, expectations, motivations, and other factors, and make judgments about it. This general sense that arises in a person after perceiving and judging the specific environment is called the sense of place (Rappaport, 1990). The perceived sense of place is descriptive, symbolic and symbolic of the concept of place (Steaman, 2016).

According to Lynch, the sense of place is a factor that establishes a connection between man and place and creates unity. He believes that space must have a perceptible identity and be identifiable, memorable and visible in order to create a sense of place. This kind of sense of place can also bring a sense of belonging (Lynch, 2016). Tuan has a different interpretation, he believes that "the sense of place is actually a distance, an abstract distance between oneself and the place" by which it is possible to understand the place" (Tuan, 1980: 4-8) The sense of place can be changed with external changes, with economic, social and political changes (Devine Wright, 2009). Modernity has a great impact on the loss of the sense of place. "The weakening of the sense of place through economic globalization is facilitated by the standard product" integrative concepts in the planning and development of urban spaces have sometimes led to the loss of local identity. As a result, currently urban development tends to reduce dependency It undermines the place and the depth of meaning as well as the diversity of the experience of the place (Scannell, 2010: 401). The sense of place is a dynamic link that a person has as a result of attachment to the place, awareness of the place, belonging to the place, satisfaction with the place and commitment to the place. The place develops them (Shamai, 1991).

The specific experience of a person in a specific environment (feeling stimulated, excited, happy, developmental, etc.) (Steele, 1981) is relative and everyone has a specific experience, but at the

same time collective, local and with a specific meaning that connects a person to the world. which transforms mere space into place (Hay, 1988: 208) sense of place emerges over time in long-term use of place (Stedman, 2002) sense of place is an experience created by the environment combined with what Six brings to it is created (Steele, 1981: 9) William in 2014 expresses two branches of the sense of place; Place as an axis of belonging and place as an axis of attachment (Raymond, 2017). They are from the human mind and without him (Lakoff and Johnson, 1999). A person is guided by the external factors that surround him, which also includes biological variables (Heft, 2013). Researchers generally use analogical methods to process such information. Input information is in the form of (cognition, belief, it refers to the belief and attitude and other mental representations about the place. Another approach that refers to the meaning of the place, which refers to the experimental processes about the construction of the place, such as the meaning and experiences of the place, which emphasizes the approach and interpretation based on knowledge and with the phenomenological conversational hermeneutic approach, how the sense of place is created is disseminated and established (Raymond, 2017). The sense of place is a link between a person and the environment as an emotional link between people and places is created after cognitions (Najafi et al., 2011: 189).

Table 1 Summary of theories

definitions	Concept	Theorist
The primary place is considered as a possible approach towards the conceptualization of space	concept	Aristotle 323
Archytas claims that every person occupies some places, and if those places do not exist, he himself will not exist (Swinburne, 1968).	dependent on the person	Archytas 428
The place seems to be acceptable by the scope that it covers and by the material objects and logical thinking.	objects	Swinburne 1934
A person is born in a village that exists before him, but gradually this village becomes his homeland with all his memories, paths and places become memories, and time and space become his life history (Schultz, 39)	the memories	Rudolph 1997
The sense of place is related to identity, and groups that are distinct and unforgettable places are not compatible (Schultz, 39).	Unforgettable place	Lynch 1981
He considers the sense of place to be experiences such as excitement and the inference of memory in a specific behavioral location and believes that it is the spirit of the place or the character of the space that evokes these special feelings.	Thrill	Steele 1981
He sees the sense of place as the experience of space by man, in other words, place is a combination of man and a special plan of the physical environment of his life, which is perceived and experienced through feeling. The desire to visit or not to visit, continuity and stability of presence, benefit from the place and participation in its activities originate from this feeling.	Space experience	Shamay 1991
The sense of place is the combination of characteristics that make a place special and unique and protect the cultural heritage of the areas, promote cultural awareness and kinship relations.	Unique place	Zou 1995
He believes that the sense of place is the distinguishing feature of the success of the regions, and with the sense of life, happiness and joy in the sense of place.	Vitality	Montgomery 1998
A sense of place is found in places that have a distinct personality. They are the identity of the place and this specific character is made of tangible things with materials, shapes, textures and colors.	Distinct personality	Norberg Schultz 2000
The sense of place is created from the interaction of three elements	Landscape -	Salvassen 2002

of location, landscape and individual interweaving, physical personality, ownership, authenticity, residents, amenities, private and collective spaces are effective in creating a sense of place.	location	
A sense of place is a shared sense of local history and geography that shows a combination of pride and commitment to improving the place	History and geography	Ralph 2007
The way places are controlled and managed over time affects the sense of place	Time	Cremona 2007
Signs are an effective factor in enhancing the sense of place.	Symptoms	Falahat 2006
Emotional attachment to a place can be related to the physical environment as well as the social environment	emotional connection	Kyle2005
The sense of place is a subjective matter and varies according to different cultures and experiences	subjective experience	Cross 2001
The perceived sense of place is descriptive, symbolic and symbolic of the concept of place	variable based on out	Devine Wright 2009
The perceived sense of place is descriptive, symbolic and symbolic of the concept of place	A symbolic description	Stamina 2016
The concept covers a wide range from human fun and enjoyment to more serious applications in life. This concept covers a wide range of relationships between people and places.	Man	Raymond 2017

In the diagram below, the variables in the sense of place literature have been extracted, which are categorized as follows;

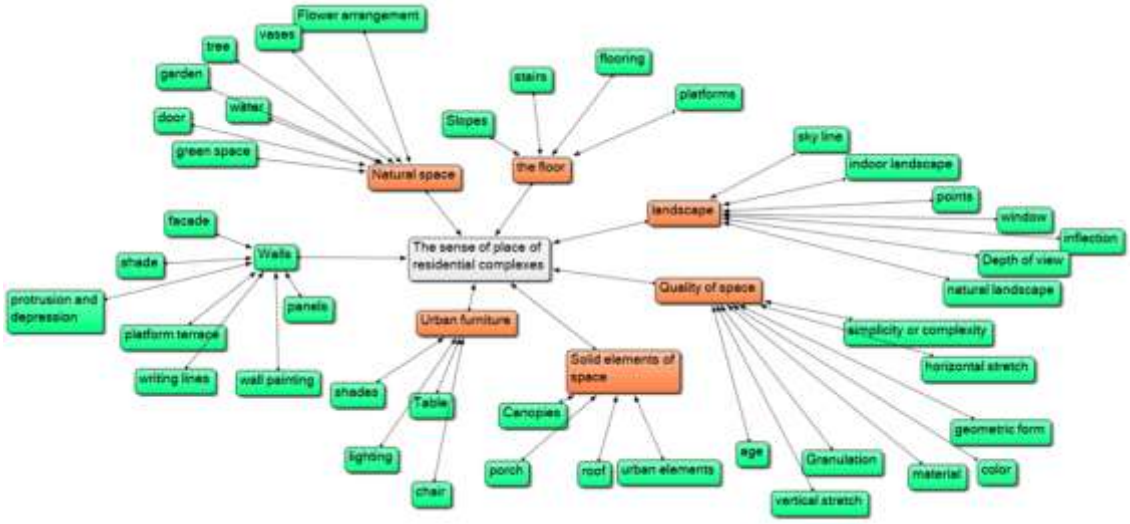


Diagram 1 Variables extracted from the theoretical and effective literature on the sense of place

3. Research Method

The research method of the mentioned research is applied in terms of purpose and descriptive-analytical in terms of method. First, to compile the questionnaire, experts were interviewed. 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 fourteen university professors who have extensive knowledge and vision in the field of vitality and have scientific-research articles and ISI. In the first stage, semi-structured interviews were arranged. In these interviews, the researcher tried to explore the approach and its relationship with the field of urban planning and architecture and to

identify the experts' view on the subject of factors influencing the improvement of the sense of place in the open spaces of residential complexes from their point of view. They also have two types of design approaches.

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, to investigate the extent of the effect of each of the sense of place factors in residential complexes and was in the direction of answering it. According to the experts, the sense of place codes and variables were classified into 7 thematic categories. These categories were: urban furniture, rigid elements of space, floor, natural space, window and quality of space. Then, the extracted variables were examined by a circle of fourteen experts in the form of a closed questionnaire with five-point Likert answers. According to the sense of place factors, the questions related to each factor include scores, which are added to the score related to the sense of place. It is checked for each element separately. According to this analysis, whether each of the sense of place variables are effective or not in residential complexes and also the extent of their influence is qualitatively determined. In order to perform 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 (residents of the considered complexes). The sample size was selected using Morgan's table, which includes 376 people who were randomly distributed in nine selected communities according to the population. In order to measure the reliability and validity of the measurement tool, the pre-test method was also used.

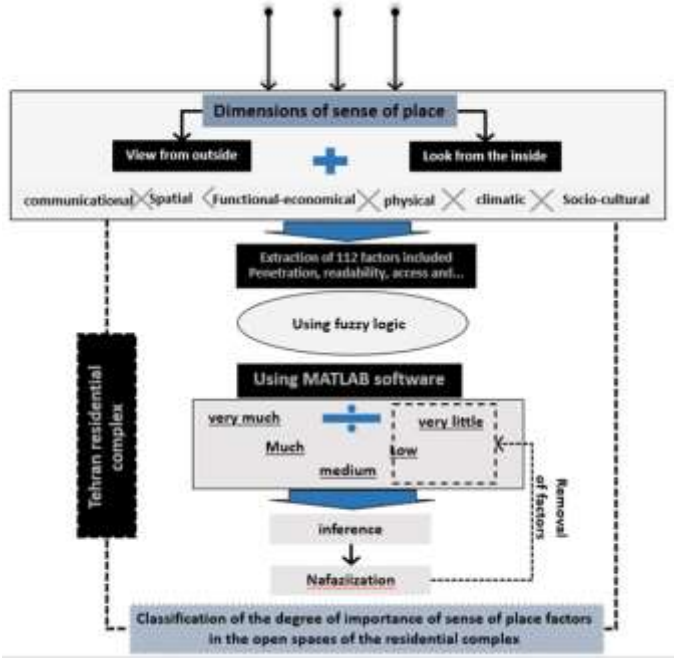


Diagram 2 The stages of performing the fuzzy Delphi research method

3.1. 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

degrees of membership. In general, the evaluation process of fuzzy inference includes three stages: 1. Fuzzification 2. Inference and 3. De-fuzzification. The purpose of this research is to reach the most reliable group agreement of experts on a specific subject, which by using a questionnaire and asking experts' opinions, many times, it is done according to their feedback. In fact, this method is a complete examination of the opinions of experts, with three main points, unbiased answers to questions and receiving their feedback and their statistical analysis, answering questions in the Delphi method, subjective data of experts using analyzes Statistics become almost objective data. This method leads to consensus in decision making. The Delphi method has been used in many fields of forecasting, decision-making and screening (Abdullahzadeh and Arzhmand, 2011: 112). In the world around us, issues cannot be divided into two or more white or black categories, but each issue fits into a spectrum. 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). In this method, thinkers present their ideas in the form of minimum possible, most probable value and maximum (triangular fuzzification).

3.2. 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 2 Membership functions related to the profile and importance of the effect to obtain the degree of membership

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

The most important part in the fuzzy inference method is building the law base. The purpose of writing these rules is to define various propositions that are obtained from the combination of different states defined for each profile (base and complement) (Pourghasemi et al., 2008: 375; Shakibaei, 2008: 149).

3.3. DeFuzzification

Non-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 Y is the true value of the output.

$$\bar{Y} = \frac{\int y\mu(y)\,dy}{\mu(y)\,dy}$$

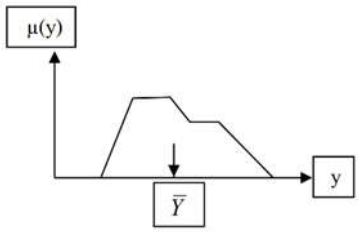


Diagram 3 The method of nephasizing the center of gravity (source: Monem et al., 2007) Statistical population of participants

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. Residential have a resume. The first person will be selected in a targeted manner and the next ones will be selected in a snowball manner.

Table 3 Selected experts

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

4. Study Area

Due to the limitations of the research, field studies were focused on selected areas that can be generalized to the whole city. At first, based on the available statistics, areas with the largest number of residential complexes were selected; Then, all residential complexes eligible for research were identified and visited in the field. Based on the information collected in the field, matching and comparing the data, the common factor between the collections, the extraction and the typology model of the residential complexes with the open space approach were compiled.

Due to the tendency to build multi-unit complexes and its noticeable increase, the statistical community included areas that tend to build more residential units in one complex (Rafiian and Hadadan, 2007, 105). According to the picture below, the massing space in the neighborhoods of Tehran also indicates the superiority of the northern areas of the city based on the number of units in the license plate. Therefore, northern regions 1 to 7 and region 14, 21 and 22 were selected as the studied regions.

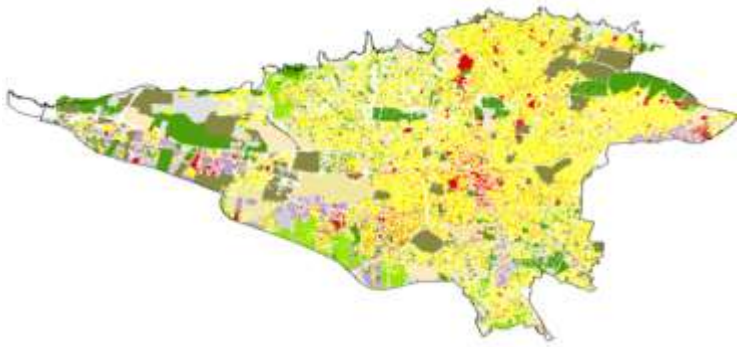


Fig 1 Residential density in the regions (Source: Tehran municipality data, 2018)

The initial selection of collections is based on the amount of open space. For this purpose, all residential complexes of nine regions were extracted with the help of existing maps of Tehran, GIS maps and satellite images. Then, all the residential complexes whose open space is more than 65% of the land surface were taken and visited in the field, and the detailed specifications of each complex were taken. Also, based on the available maps, Google Earth images and field survey of the site plan of the collections were extracted. In order to obtain a sample that represents the entire statistical community, residential complexes as described below, whose characteristics cannot be generalized to the entire city, were excluded from the studied community.

• Military and law enforcement complexes that are built and supervised by the Ministry of Defense and the Army of the Islamic Republic.

• Residential complexes that belong to a specific and limited segment of the society.

• Residential complexes that, despite allocating less than 35% of the area to the built space, their open space is undesigned, barren and lacks green space.

• Residential complexes that, despite being built at the same time and integrated, do not have a precise and specific spatial boundary and are sometimes divided into smaller blocks.

• The residential complexes where the residents stay for less than 5 years, the complexes in the northern areas of the region, belong to the constructions of the last decade, which were formed by the expansion of the city, and the complexes belonging to the decade of 1970 are concentrated in the middle part of the region. None of the residential complexes located in Haft region, due to their limited open space, did not match the conditions of this research. In total, in nine regions, 52 eligible collections were found for the purpose of the research. According to Table 4, the complexes include 637 blocks and 29,476 thousand residential units.

Table 4 Statistics of studied residential complexes in each region by the number of blocks and units

Name of the region	The number of sets	Total block	Total unit
1	3	17	1216
2	23	353	11925
3	2	6	805
4	7	59	2114
5	4	71	8540
6	6	22	1360
14	1	2	320
21	1	16	404
22	5	91	2792
Total	52	637	29476

Table 5 Typology of residential complexes in each region by the number of blocks and units

Number of units			Pattern of open spaces of residential complexes	Height
+505	**216-504**	**216 <**		
Spring city arrow	-	Nasim Danesh	Scattered	**6<**
College students Kush	The mountain Apadana City culture 1	Saman region 2	Strip	
-	-	Prophecy	Concentrated	
Sadra Akbatan	Sinai Flowers zone 4 purple Behjatabad	Flowers (Sadatabad)	Scattered	**12-7**
-	Besat	Golnaz	Strip	
-	Academics Optimizers Ashrafi Mahan	The breeze	Concentrated	
Glory be to you Hormzan Prince Park Future A Future B	Golestan Pars Sattarkhan Venk Pars Biston and Persepolis	Tulip	Scattered	**+13**
-	-	-	Strip	
Ati-saz C Mehstan Hafez A.S.P	Hope Iran land Sarvistan	Mahestan	Concentrated	

5. Findings

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 (Table 3).

According to the above diagram, the importance of the effect of each language variable is shown. In order to evaluate the fuzzy model, the sense of place factors and features whose quality was determined by 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 2; That is, as the variable x increases, the value of the language variable in each class increases, which can be 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 Yˆ = 0.67, then the fuzzy logic determines the degree of membership for two membership functions. It improves slowness and uncertainty.

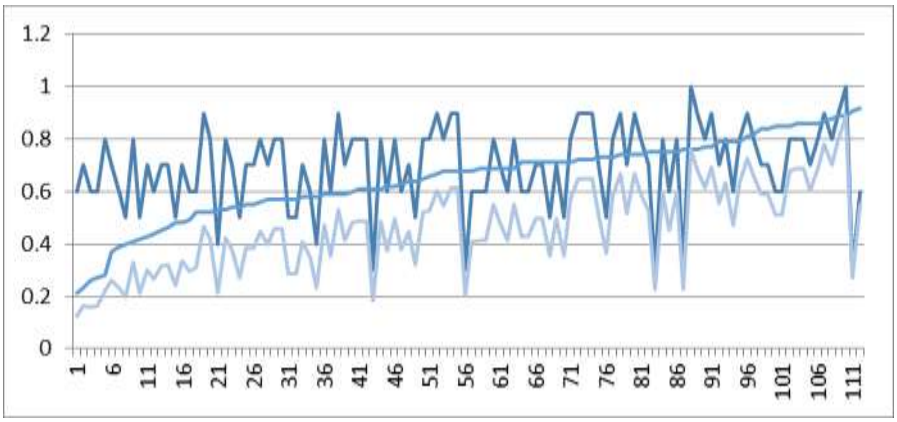


Diagram 4 Classification of the importance of each linguistic variable

By examining the table 6, it can be seen that out of 49 factors, in urban furniture, lighting with a value of 0.77 and membership degree H is the highest, and trash cans with a value of 0.21 and membership degree VL is the least and can be removed. In the solid elements of the spaces, the elements with the value of 0.89 and the membership degree of VH are the highest. In natural spaces, the water feature is 0.85 and membership degree is VH. In the walls, panels with a value of 0.87 and membership degree of VH and doors with a value of 0.37 and membership degree of L are the lowest. In terms of landscape, the natural landscape with a value of 0.88 and the membership degree of VH and the skyline with a value of 0.21 and the membership degree of VL are the lowest. From urban furniture, trash cans are from the VL category, from the floor, the slope of the ground is from the L category, and from the natural space, the tree is from the L category, and from the windows, the doors are from the L category, and visual platforms are from the VL category, and from the perspective of depth of vision and weak points They belong to the L category and the sky line belongs to the VL category, and the quality of the color space belongs to the L category and they can be removed.

Table 6 Components that were removed in fuzzification

Fuzzy Logic					
Factor	Degree of membership	Category	Factor	Degree of membership	Category
Table	0.53	M	Door	0.37	L
Trash bin	0.21	VL	Written lines	0.55	M
The chair	0.56	M	Prominence and depression	0.53	M
Lighting	0.77	H	Symbolic shades	0.71	H
Shades	0.61	H	Mural	0.69	H
Raoqha	0.69	H	the terrace	0.59	M
Ceiling	0.54	M	Visual platforms	0.21	VL

Germans	0.89	VH	boards	0.87	VH
Slope	0.44	L	view	0.59	M
Platforms	0.56	M	window	0.79	H
Flooring	0.69	H	depth of view	0.49	L
Step	0.58	M	weak points	0.51	L
Flower decoration	0.68	H	Interior view	0.60	M
Flower pots	0.61	M	Natural landscape	0.88	VH
Fountain	0.85	VH	Skyline	0.21	VL
Garden	0.68	H	Scale	0.84	VH
Tree	0.52	L	Old age	0.87	VH
Green space	0.69	M	Simplicity or complexity	0.85	VH
Floor / Solid elements of space / Urban furniture / landscape / Wall / Natural space / Quality of space			Vertical elongation	0.62	H
			Color	0.49	L
			Material type	0.74	H
			Horizontal elongation	0.84	VH
			Geometric form	0.64	M
			Grading	0.89	VH

In the diagram 5, an example of the surface observer of the fuzzy model is presented considering the effect of 49 variables in different dimensions as input variables. In this diagram, you can see how different input values affect an output value (sense of location). In the sense that you can see the reaction in one view. According to the diagram below, the sense of place is associated with an almost irregular trend of the qualitative degree recorded in the surface observer.

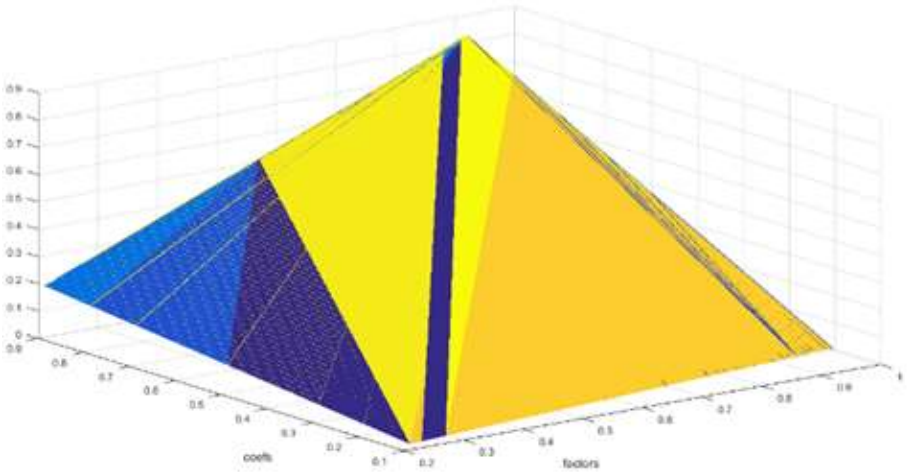


Diagram 5 Variables in the areas of urban furniture, solid elements, walls, etc. with MATLAB software

In this way, relying on the table and considering the direct effect of the investigated indicators on the sense of place of the mentioned residential complex, the frequency distribution of the two residential complexes was visited in the field according to the diagram below, and for the accuracy

of the effect of each variable, a linear diagram was made. The regression for the drawn factors, which indicates the accuracy of the impact in the residential complex, both lines benefit from a curved slope.

In addition to being an arena for the formation and strengthening of people's social interactions, residential complexes are places with the characteristics and requirements of a house, they are also a suitable place for recreation, entertainment, sports and spending leisure time of different strata of society, but nowadays in researches Various open spaces in residential complexes are limited to closed and limited spaces of balconies or small private yards on the ground floor, parking lots or shared spaces without a plan, and the sense of place is only considered from a few dimensions. Therefore, in order to make proper use of this approach in residential centers, the importance, location, and function of residential complexes were investigated and analyzed in this research in order to use the maximum capabilities of open spaces to achieve a place with a sense of place. And in addition to that, it should also contribute to collective benefits, to achieve some kind of revival of family activities in traditional and private courtyards of houses. Finally, after adapting this relatively complex chart to the current state of open space in residential complexes and relying on analytical comparison, it was determined that;

It was found that the presence of lighting is very important among the urban furniture in the residential complexes of Tehran and it can make the presence of people at all hours of the day and night and increase the efficiency of the spaces. There is a difference between the daily hours, from the solid elements of the space, the elements due to the meaning and conceptualization of the narrative, as well as the metaphor of the specific themes, can be engraved in the audience's mind and create memories, and from the natural space of the presence of water features due to the softening of the air. Both physical and psychological aspects of people can cause more impact than other factors. Due to the presence of decorative elements and the emphasis on additional elements, the panels can strengthen the sense of place and evoke the desired feeling in the spatial audience and give a special identity to the space. From the point of view of the natural landscape as a background for different images and with minor changes in different seasons, it can increase the sense of place in the space or create it. For the accuracy of the influence of each factor in both residential complexes, a regression line is drawn for the distribution of the obtained data. The slope of both these lines has the same coefficients in the direction of increase. This is due to the influence of the components to a slope and amount in each of the oil or non-oil collections. In the next step, in order to check the impact of each of the variables in different dimensions, the factors that have "low" and "very low" effects were screened. From the table 1, items such as trash cans, trees, doors and visual platforms and depth of view, weak points, sky line can be removed due to being in low and very low.

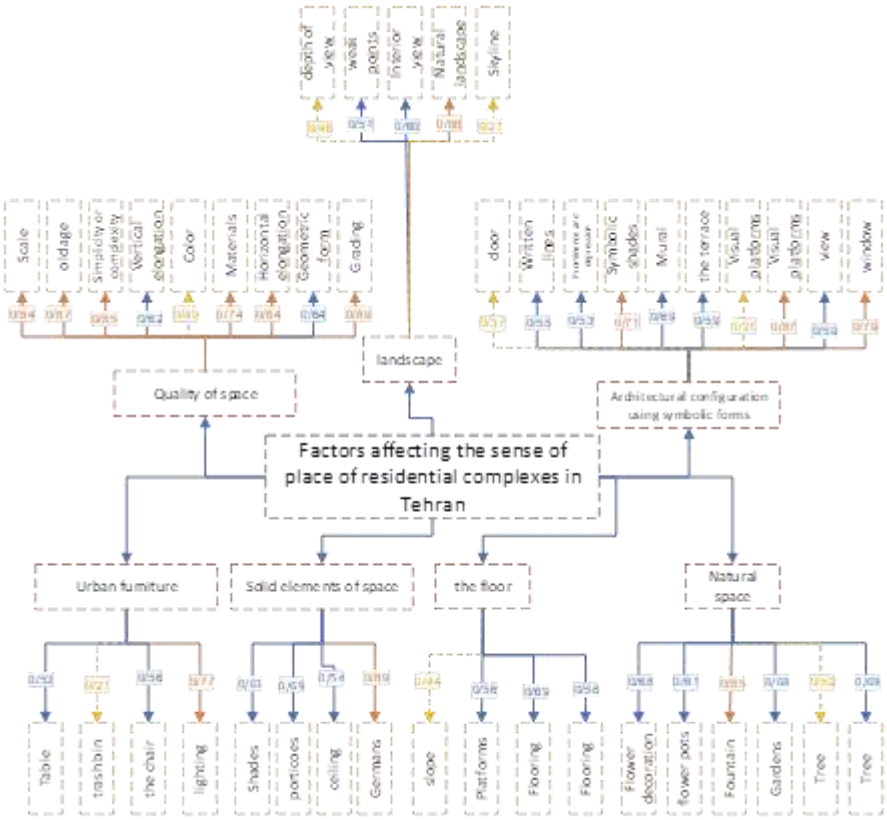


Diagram 6 Effect of each factor on the sense of place of residential complexes

6. Conclusion

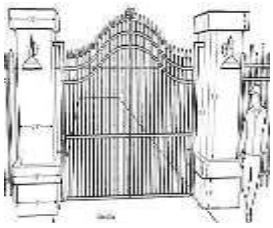
Cities are considered to be the greatest achievements of mankind in terms of technological, economic, cultural, and social aspects. The different relationships of people with each other and the living space of the tunnel are exciting. Following this, the need to pay attention to the concept of the quality of space and its improvement in residential complexes is already felt. Because the basic role of the environment is to respond to predetermined functions. If the environment is not designed properly, the desire of people to be present in the space and participate in it will be reduced and the ability of the person to communicate with the environment will be lost. In other words, if the surrounding environments located in residential complexes are not purposefully and creatively designed, they cannot establish the necessary relationship with their users. Therefore, in addition to its physical aspects, these spaces should also be addressed to its spiritual aspects, so that its effective factors can be used as the first and most vital residential space and the desired quality of the spaces can be restored. Residential buildings in Tehran city are from the sense of place and the investigation of environmental indicators and their screening. For this purpose, theoretical literature in this area is first collected and the factors are extracted. The criteria were scored in five categories according to table 1, and finally the variables that had "low" and "very low" effect on different dimensions of the sense of place were removed, and thus the effective factors in the sense of place in Residential complexes were identified.

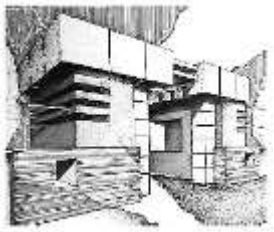
The conducted evaluations show the fact that the categories that have a "high" effect on the sense of place of residential complexes are respectively: quality of space, view and view, windows,

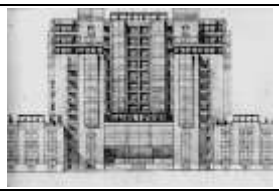
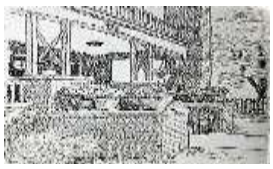
solid elements of space, natural space and urban furniture and floor. Also, the sense of place in different groups by families has not been taken into consideration and exploited in almost any of the visited complexes. Only in some residential complexes, according to the special design of a group of building blocks, private terraces and balconies have been created for residents, which, due to their considerable size, meet the needs of a group of families for outdoor space. Also, the scattered structure of the mentioned complexes has led to the creation of spatial diversity and a different range of privacy and public in the open space of this complex; And the amount of direct lighting of the apartments and natural ventilation between the blocks is more than the patterns of other complexes.

Components related to cultural and social needs and activities exist only in some residential complexes, which, of course, have been considered in open spaces after residents felt the need and by changing the use of parts of parking lots or building low-quality buildings. Is. The components of the economic field have been built in the form of commercial complexes in various scales in the visited complexes. In almost all the visited complexes, the physical, spatial and environmental-climatic aspects have been considered. For productivity and inducing a sense of place in residential complexes, various components and reinforcements should be used in the space.

Table 7 Solutions for the sense of place in the residential complexes suitable for each component

Components	Solutions	Sketches
Height	In order to achieve the advantages of the short-order species to increase the security and controllability of the environment, as well as to use the advantages of the intermediate-order species to increase the density per unit area and increase the area of open space, it is suggested to use a combination of these two species. The location of the middle tier should also be such that it does not cast a shadow on other buildings.	
Physical, social and economic continuity	In order to achieve the present components, the site of the project is selected in such a way that it can create a suitable link with different uses such as commercial and green spaces. It is also suggested to consider commercial and sports use in the physical program on a scale that has justification and continuity of economy.	
Identification	In order to achieve the present components, more diversity in the design of residential units, as well as differentiating the different scales of the complexes from each other and legibility and diversity in the form of the buildings, which causes the adjustment of the scale of the large complexes, is suggested.	
A sense of security	Defining the territory of the residential complex by physical factors and defining an entrance gate with a guard, reducing inappropriate visibility along the fence around the complex with physical factors and softening it by using natural factors, avoiding the creation of dumb and blind corners by considering. Pedestrian and riding routes around the site, creation of medium density in order to avoid crowding or solitude, the ability to monitor the open space of residential units.	

Children's play area	The children's play environment should be established in such a way that a proper view from the units to the playground is possible.	
Seating areas	It is recommended to pay attention to the sitting space for parents to observe and supervise children, the type of bench, the choice of the location of the bench according to the surrounding views, the types of seating and special rest benches for the elderly and the physically challenged.	
Permeability	The small scale of the constructions, especially in the open spaces of the complex, so that there is suitable land for creating all the activities in the complex. There is a path for riding and walking inside the complex. So that it is possible to access the place for both pedestrians and riders. The existence of a hierarchical system inside the plans and in the open space of the complex.	
Variety	Diversity in space and scale of space and height. Such as the variety in the number of floors and the existence of various plans in the blocks and the existence of different uses in the complex and the absence of uniform and uniform buildings. Variety in facades and decorations. Variations in light and reflectors, such as the use of mesh windows. Diversity in structure.	
Readability	The presence of the main gate and the presence of a guard at the main entrance of the complex. The presence of necessary readability in the facades of the building. Like the non-identity of the views and the form of the buildings. Ease of understanding the space from the functional aspect. Respecting the spatial hierarchy of the entrance, yard and spaces inside each unit.	
Key body elements	Existence of elements such as road, edge, domain, sign and nodes such as the main and central square.	
Flexibility	There are places to increase activities and increase social interactions. Like having a chair to sit in the green space. Existence of active places such as sports field and children's playground and places to sit and shopping center and coffee shop. Ability to change activity in space. Like the presence of a suitable balcony to be used as a space for eating in some seasons. The presence of shady vegetation and temporary canopies.	
Applicability	The existence of a space with a multi-purpose appearance, such as the use of fountains and covered ceilings. Appropriate combination of spaces with each other. and the existence of spatial hierarchy, order, unity, geometry and symmetry.	

Visual proportions	The presence of quality details, especially in the facade. The presence of balconies in most of the block's plans. The amount of shading according to different heights should be taken into consideration. The volume should be designed in a way that it prevents the creation of shadows in the central life of the collection.	
Sense of belonging	The possibility of color belonging to the environment by people who can change their values, interests and personal signs based on it. Such as the use of natural materials and materials, including stone and brick, which can cause the mind to belong to the building and ultimately cause familiarity with it.	
Use of natural agents	Proper use of sunlight. For example, all plans should have light from at least two sides. Optimal use of wind. Dealing with issues caused by temperature rise and fall. For example, indoor and outdoor spaces should be made according to different seasons of the year in terms of temperature balance.	

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Investigation Nature-Inspired Strategies Attendance in Iranian Architectural Works during the Second Pahlavi Era

Niloufar Zounemat Kermani[a], Farah Habib[b]*, Azadeh Shahcheraghi[c]

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

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Research Article

Abstract

The study of architectural principles in different periods shows that nature has always played a significant role in architectural styles and human life. It is also possible to find a deep relationship between the salient features of society in the formation of architectural identity in the context of nature. Therefore, finding and investigating the relationship between architecture and nature's presence over time and how to use nature-inspired design strategies in architecture indicates the need for this research. This study aimed to study nature's attendance in some landmark works of the second Pahlavi era, to identify different approaches to looking at nature, its use, and the reasons for its emergence. The research was carried out with qualitative methods in two main sections: Step 1: Theoretical analysis to identify and classify the sociopolitical developments during the second Pahlavi Era, the key elements of natural strategies, and nature strategies attendance in architecture. Step 2: Use logical reasoning and a case study to determine the attendance of nature strategies, architectural layers, and systems, and the new discourses in the second Pahlavi Era. The studied superior architectural works have been selected based on the possibility of access to the necessary documents for data analysis. After presenting the research methodology, it develops the theoretical foundations of the research and then investigates the concept of nature and how it is present in the architecture of the second Pahlavi period. In the second Pahlavi period, the spread of modernism, political and structural changes in government, and the changing needs of society paved the way

* Corresponding author. Farah Habib

E-mail address: frh_habib@yahoo.com

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for explaining new discourses. These discourses are manifested in the form of traditionalism, historicism, and modernism. In this period, the manifestation of nature has been witnessed in different forms in architecture, which means that in 1941, the secondary appearance and especially the abstractive appearance was considered. But over time and in the years 1943 to 1952, the attention of architects has been drawn to the original appearance of nature, and the use of natural elements in a pristine form. This special attention to the primary appearance of nature continued until 1970. In the years 1970 to 1979, we see nature's secondary appearance becoming more prominent in architectural works.

Keywords: Nature-Inspired Strategies; Iranian Architecture; Second Pahlavi Era

1. Introduction

The concept of nature has been the basis for the interpretation of science, art, and architecture, from ancient mythological to modern perspectives on nature. Designers' different approaches to nature from the past to the present have led to the establishment of architectural spaces with different qualities. The concept of nature becomes very complex when it includes spiritual and intangible concepts in addition to tangible ones, and its interpretation will require appropriate models. Therefore, recognizing the evolution of the relationship between architecture and nature in different approaches can be useful in understanding the architectural work and the process of creating the work for architects and designers (Falahat and Shahidi, 2010: 38). The current research methodology is of argumentative type and its research method is Descriptive Analytics and logical Argumentation (Fig 1).

Nowadays in the theories of many thinkers, there is a new ontology in which a harmonious relationship between man and nature and the revival of human nature is sought. Among architectural approaches, the relationship with nature has become a controversial issue (Noor Mohammadi, 2009: 50). The extent of man's authority and influence on nature has gradually led to a change in human life and his demands and needs. As a result, the architect's point of view has changed; The architect's strategies in the design of architectural space have changed from the structural foundations of nature and the truth of human life to other factors (Balkanlu and Mashari 2015). The necessity of choosing the period of study can be acknowledged as follows: Although the architecture of the Pahlavi period belongs to the recent past and has been discussed, critiqued, and interpreted in various ways and in great detail, the roots and critique of ideas influencing the formation and evolution It (especially the second Pahlavi period) has passed in silence and ambiguity; Pahlavi architecture has the opportunity to have a narrative based on documents and certainty, to an interpretation based on conjecture (Sultanzadeh, 2020: 72). Moreover, a large part of Iranian architecture is rooted in the theories and views of educated architects of the previous period (the second Pahlavi era), so it is important to know the various approaches of that time to continue the path or change the possible direction. To conduct the research, the main question that was defined is: How and on what basis was the evolution of the attendance of nature in the second Pahlavi era?

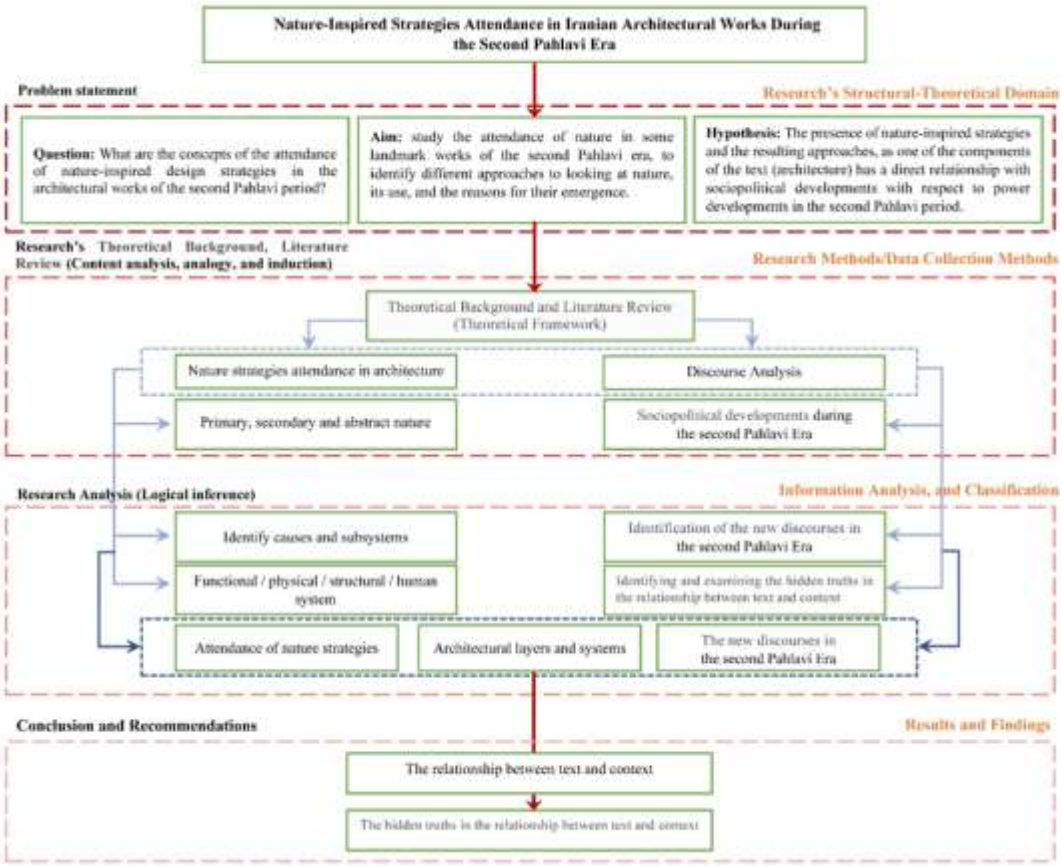


Fig 1 Research methodology

2. Theory

2.1. Nature Strategies Attendance in Architecture

The concept of nature and how to look at it throughout history has been one of the fundamental concepts in the interpretation of existence, science, and art. The complexity of the concept of nature makes research on it especially necessary after fundamental changes in modern life. After the Industrial Revolution, man acquired new methods and tools and progressed in science, technology, and production; At this stage, nature as the most important source of raw materials was used indiscriminately, with the lack of resources and pollution of ecosystems and the environment, the attention of various scientific circles turned to the subject of "nature"; In such a way that today, preserving the environment and achieving sustainable development is one of the fundamental issues of the scientific communities of the world. In this regard, architectural design as a coordinator of man, environment, and space in interaction with nature, has adopted different approaches (Falahat and Shahidi, 2010:37; Antoniades, 2005). On the other hand, according to Raymond Williams, "the history of the use of nature is a large part of the history of human thought." Nature has always been used as an influential component in the formation of architectural theories. Although efforts have been made to revive nature in the field of architecture since the 1960s with the advent of environmentalist approaches, there has been a significant interruption in this process in the second

half of the twentieth century, at the height of modernism (Forty, 2000: 220). Adrienne Ferty classifies the relationship between man and nature by ten main currents throughout history: 1. Nature as a source of beauty in architecture, 2. Searching for the source of architecture in nature, 3. Increasing the value of architecture as an imitation of nature, 4 Citing nature as a justification for the artist's license, 5. Nature as a free political idea without coercion, 6. Nature as a construction of receiving observers, 7. Considering art as a second nature, 8. Nature versus culture, 9. Rejection of nature in the second half of the twentieth century and then the current of environmentalists, 10. Nature as an ecosystem and a critique of the capitalist system (Forty, 2000). A study of scientific and philosophical texts on the concept of nature shows that different concepts of nature can be placed in three general categories of perceptible world, natural disposition, and source. Also, the relationship between nature and architecture can be examined in three periods: premodern, modern, and postmodern; In the pre-modern period, more attention was paid to the source of the universe, and therefore nature means origin, and nature was expressed by architecture. During this period, many temples were built for gods and natural forces, because man considered the movement of his world to be dependent on gods and transcendental forces (Ghoddusifar, 2013). In this period, nature has two characteristics: "earthly" and "cosmic"; Which cosmic character takes precedence and is considered the most basic feature of ancient insight. Ancient humans used animal paintings or bones to decorate their original temples, as these decorations had specific transcendental meanings. However, due to the rudimentary construction technology, this architecture could not express the inner meanings well in appearance. This type of architecture can be called "architecture within nature" in the complete monopoly of nature that rules the universe; in other words, it is created inside nature (Moran 2012; Egenter 1992). In the modern era, human views changed and led to the Industrial Revolution and the great advancement of science and technology. Rationalism and humanism are the characteristics of this period that consider man as the doer and reason and separate him from the universe and God. In this period, nature was recognized only in the sense of all beings and as an inexhaustible source of raw materials for the development of industry. Architecture in this period was reduced to the quantitative affairs of man and the physical standards of his life and unlike ancient architecture which was a guide and in accordance with human philosophical goals, it was adapted only to human needs and did not pay attention to its aspects of guidance and promotion. He saw a complete response to basic human needs. But it was not long before the environmental crisis, human exploitation and anonymity pervaded modern society. The architecture of this period can be called "nature-dominated architecture" because the nature of all matters was the complete monopoly of human thought (Mohammadzadeh, 2014; Furst and Skrine, 1996).

In the postmodern period, a combination of technology and nature appears to ameliorate the crises of modern thought. In this period, nature, natural forces, ecosystems, and the type of relationship and coexistence of animals with the environment were considered, and consequently, the architecture of this period was influenced by this thinking. During this period, the concept of sustainability was born and developed in the scientific circles of the world. The architecture of this period can be called "architecture with nature" because the architects in this period pay attention to the nature of things, also use the elements and natural forces correctly in their place (Fig 2) (Daneshjoo et al. 2015; Mohammadzadeh, 2014; Taheri et al. 2011; Wahl, 1991; Nasfi, 1983; Nasr, 1967).

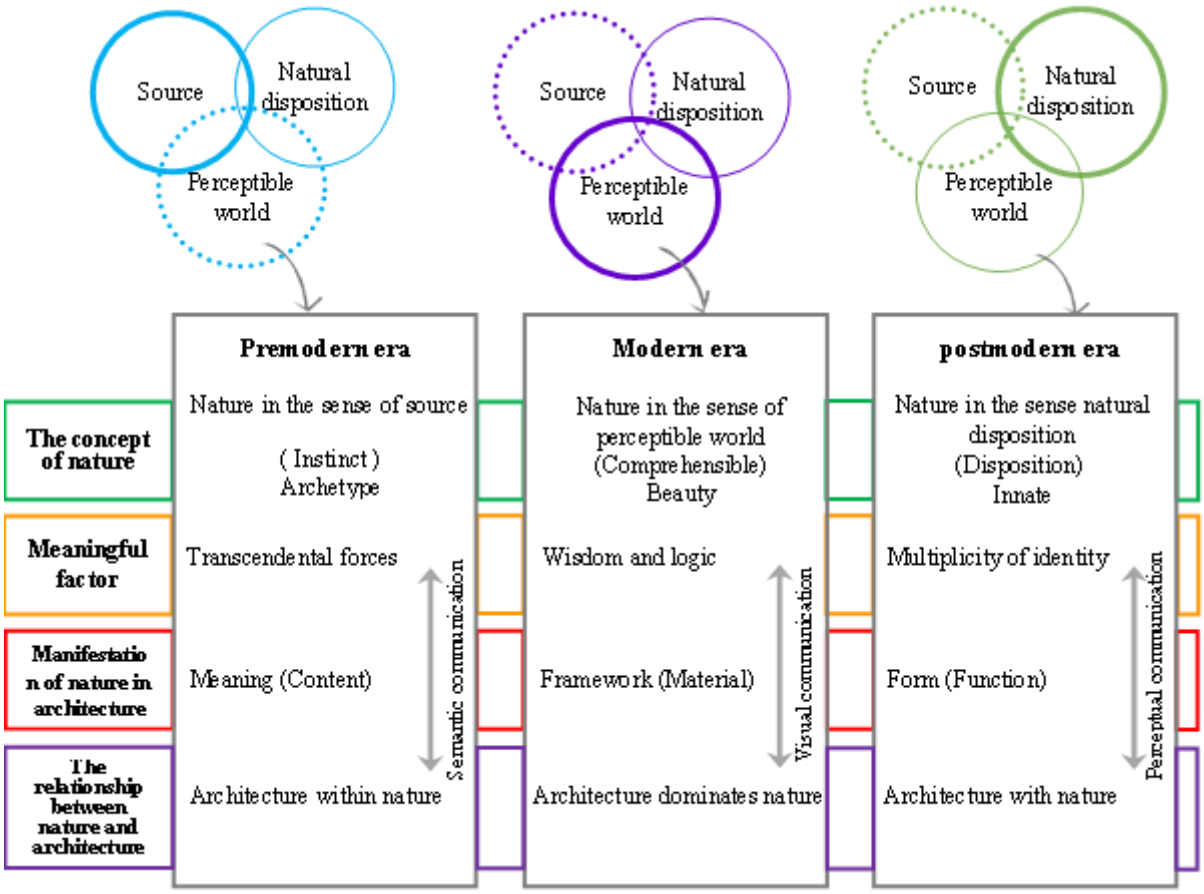


Fig 2 The evolution of nature and architecture. Reference: Authors Based on: (Antoniades, 2005; Daneshjoo et al. 2015; Egenter, 1992; Falahat and Shahidi, 2010; Furst and Skrine, 1996; Ghoddusifar, 2013 Mohammadzadeh, 2014; Moran, 2012; Nasfi, 1983; Nasr, 1967; Taheri et al. 2011; Wahl, 1991)

There are various approaches to defining architecture, one of the most comprehensive of which is the systems approach. With this attitude, we can define architecture as an integrated whole to achieve the goals of housing, better performance of behaviors, and life that has components related to its purpose. The most important systemic approaches have defined architecture as a natural (organic) system or man-made (machine) system, which has different order, unity, shape, and structure based on each. Human structures that relate to cultural and identity factors, beyond the mechanical mechanism or the natural organism, are called intelligent human meta-organism. It can be defined in three main layers of architecture as well as five subsystems (environmental, human, functional, structural, and formal) (Noghrekar et al. 2017: 18-19). In defining the primary and secondary nature, Spirn says: Primary nature is a nature that has not been transformed by man and has not become a secondary nature (Whiston Spirn, 2016: 41). Elements such as sky, water, wind, soil, and various forms of life, including plants and pets, were all available in the form of primitive nature and were together and in action and reaction towards each other and human beings (Daipour, 2015: 52). Man has used the same elements to meet the material and functional needs, nutrition, temperature adjustment, and spiritual needs of creating beauty by making limited and non-destructive changes to the primary nature and has created elements with the nature of the secondary

nature such as building materials, cultivation plants, etc. The abstraction of nature has been the third form of presence. In abstraction, nature was represented by a human definition by simplifying, separating features, and sometimes the geometry of shapes (Fig 3) (Afshari Basir et al. 2018: 300).

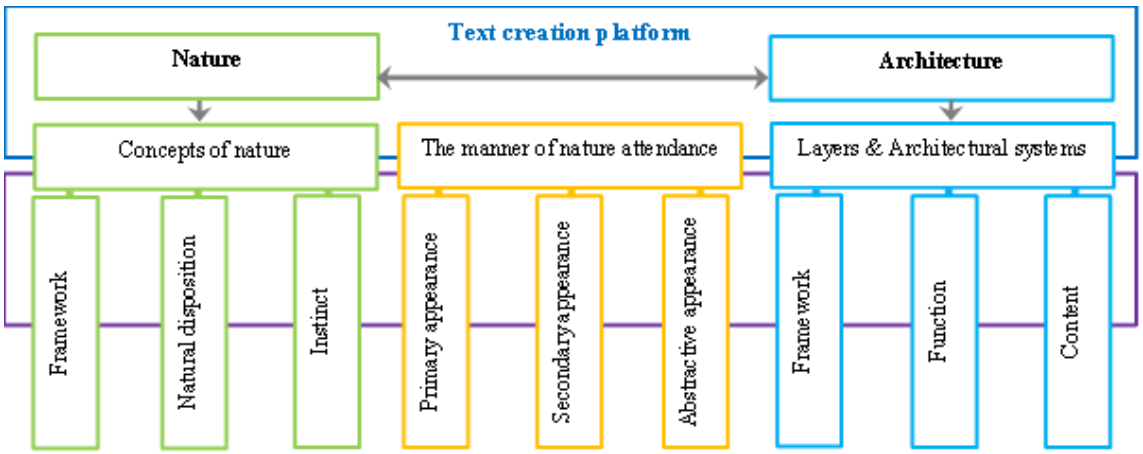


Fig 3 Text creation platform, layers, architectural systems; The image of nature and its concepts. Reference: Authors Based on: (Afshari Basir et al. 2018; Daipour, 2015; Noghrekar et al. 2017; Whiston Spirn, 2016)

2.2. Discourse Analysis

Discourse analysis is an interdisciplinary study trend that emerged from the mid-1960s to the mid-1970s following extensive scientific-cognitive changes in fields such as anthropology, ethnography, micro-sociology, social and organizational psychology, poetry, semantics, linguistics, semiotics, and other fields of science. Social and human interest in systematic studies of the structure, function, and process of production of speech and writing has emerged. This trend, due to its interdisciplinary nature, was soon welcomed as one of the qualitative methods in various fields of political science, social science, communication, and critical linguistics (Mahdavi Nejad, 2017). The basis of discourse analysis deals with the use of language in social contexts, especially with interactions or conversations between speakers. In the discussion of discourse analysis, two points of view are proposed: 1. The structuralist point of view is concerned with the form of the text (examination and analysis of larger units such as sentences), 2. The functionalist point of view is concerned with the function of the text (why and how to use language). The levels of discourse are 1. First of all, the text has a generality that is dependent on it. Inside the text, there are a set of elements that are not only related to each other but also make a whole, which is called text or discourse. 2. The text or discourse relies on a set of external factors. These factors are effective both in the text production process and in the interpretation process. The process of production and interpretation interact with each other and as a result, affect each other. 3. It indicates that a text, in addition to the context of the text and the process and interpretation of the text, is strongly influenced by the social conditions in which the text is produced or interpreted. The social and cultural context has a much greater impact than the context of the text and its production and interpretation process. Norman Fairclough uses discourse analysis at three different levels: the first level, discourse as a text, and the second level, which is wider than the first, discourse. As the interaction between the process of producing and interpreting the text and the third level, which is the macro level, the discourse is the background (Bahrampour, 1999).

2.3. Architectural and Sociopolitical Developments of the Second Pahlavi Era

According to Michel Foucault, without understanding power, it is impossible to understand society. In today's world, the system of power is more entrenched and invisible than traditional systems of power in the past, and this requires that we go beyond the classical and traditional concepts of power. Whereas in previous systems, power was thought of as something that functioned only in the political sphere and was negative and repressive, Foucault believes that this perception covers the actual function of power and truth; Because the system of power, unlike in the past, is not only negative and repressive but also positive, productive and creative. Power has no nature and manifests itself in various forms in society. Wherever power is exercised, knowledge is also produced; In other words, power and knowledge accompany each other (Nawabakhsh and Karimi, 2009). For this purpose, in this section, we study the system of power and the resulting developments in the second Pahlavi period, and at the end, the results of the study are presented in a categorized form in the form of a table. In the second Pahlavi period, the change of government policies increased the power of the central government, the growth of economic power, and greater ties with the West, which resulted in activities in the development of various infrastructure and civil works (Ghobadian, 2014: 219). During this period, with the government's efforts to keep pace with global developments, several cultural achievements were achieved in the field of architecture and urban planning. Hence, new discourses were formed and new styles emerged. Traditionalist discourse, with the same style as the first Pahlavi period and accompanied by modern technology, carried the glorious heritage of the Islamic era. During this period, in order to revive the past values of Iran and to remind the glory of the ancient history and culture of Iran, a new discourse called the discourse of historicism was formed. Modernism was an extraterrestrial discourse that, with the rise of modernism in Europe and its influence in Iran, led to the formation of various tendencies.

The architecture of the second Pahlavi period, known as the pioneers of the second generation, can be expressed in the form of a cultural triangle: the influence of Western culture and civilization, the historical heritage of Iran (with a prominent role of pre-Islamic architecture) and the emergence of architects. The first factor is important because the philosophical, scientific, economic, and military capabilities of the West have had a definite effect on the way of life and thought in Iran. The second factor is important in that it is the main source of Iranian cultural and intellectual identity. The third factor is decisive because architects, as creators and narrators of culture, have played a vital role in mediating between Western culture and Iranian cultural heritage (Ibid p.181-186). During this period, modern architecture became the dominant and influential current of Iranian architecture. The modern architecture formed during this period was mainly supported by the works of European architects and current ideas, including the international style, the Bauhaus school, the works and ideas of Le Corbusier, Frank Lloyd Wright, Richard Newtra, Alvar Alto, James Sterlino, and the result was the Iranian form of architecture. It was modern, dubbed "quasi-modernist" architecture. A current parallel to the prevailing atmosphere of modern Iranian architecture, which was mainly supported by Iranian-educated people both inside and outside the country, was formed between 1961 and 1971 and was strongly influenced by the atmosphere of Iranian intellectual currents in those decades. The architecture formed during this period was a combination of international and ecological style architecture. Most of the works of this current are considered to be influenced by the ideas and issues raised in post-modern Europe and the issues raised in postmodernism (Bani Massoud, 2009: 243-244). The architectural patterns of the second Pahlavi period and its related physical components can be categorized as follows: 1. The so-called traditional architecture which has almost the same characteristics as the architecture of the first

Pahlavi period; 2. Modern Iranian architecture seeks to revive the values of the past, the historical and cultural identity of Iranian architecture, in which tradition and modernity are equal to each other and is included in the physical design of the building (Ghobadian, 2014: 265). The general trend of Iranian architecture in this period can be divided into three main categories. 1. Modern architecture with Iranian taste 2. International style architecture 3. Iranian ecological architecture style (Sobat Sani, 2013: 58). By studying the documents, we examined and categorized the social and political conditions of Iran in the second Pahlavi period in three periods the prime period (1951-1941), the mid-period (1953-1963), and the final period (1963-1979). In each of the mentioned time periods, after identifying the dominant trends of the desired time period, the architects and the relevant superior architectural works in the time period have been identified and the relevant trend has been identified, and the results are presented in Table 1 (Afshari et al. 2020; Sultanzadeh et al. 2020; Haghjoo et al. 2020; Hassanpour and Sultanzadeh, 2016: 39-52; Ghobadian, 2014; Sobat Sani, 2013; Bavar, 2009; Bani Mas'ud, 2009).

Based on the theoretical literature of the research and study of the structure, conditions, currents, and underlying factors in creating new discourses and its effects on the architecture of the second Pahlavi period. It is possible to examine the presence of nature in the superior architectural works of this period by examining the primary, secondary, and abstractive appearance in three layers of the framework (exterior), functional (middle), and content (interior). In this process, the text framework layer is a constituent shell that includes the form, architectural arrays, and perimeter that nature framework manifests itself through architectural components such as axis, geometry, hierarchy, rhythm, repetition, and symmetry. In the functional layer, the functions and relations between spaces are analyzed. The diversity of nature's presence in this field is meaningful for the concepts affected by place, human interactions, and relations with the surrounding spaces. The content layer, by being at the center of the two layers mentioned, conveys traditions, myths, beliefs, and convictions to the audience in different ways. Some architects have considered the adaptation of the building to the natural environment as the source of their inspiration from nature. In natural history, the general law states: Only species that can adapt and live in harmony with their environment are able to live and survive. It is a well-known fact that various natural forces seek materials and forms combined with themselves for harmony and excellence (Daneshjoo et al. 2015: 86). Therefore, in order to use natural energies, harmonizing the environment with the prevailing climatic conditions is the first step, in other words, the necessary condition for using natural conditions is the coordination and adaptation of buildings to climatic conditions (Ayvazian, 2020).

Table 1 The presence of nature design strategies in architecture Reference: Authors Based on: (Afshari Basir et al. 2018; Antoniades, 2005; Ayvazian, 2020; Daipour, 2015; Daneshjoo et al. 2015; Egenter, 1992; Falahat and Shahidi, 2010; Furst and Skrine, 1996; Ghoddusifar, 2013; Mohammadzadeh, 2014; Moran, 2012; Nasfi, 1983; Nasr, 1967; Noghrekar et al. 2017; Taheri et al. 2011; Wahl, 1991; Whiston Spirn, 2016)

Nature design strategies in architecture		
Elements and items	**Method / Keywords**	**Nature appearance**
The four elements of nature	Water/wind/light/plants	Primary appearance/ Framework
Decorations and symbolism	Use natural colors and patterns, plant and animal motifs	Secondary appearance/ Framework
Materials	Use of materials, as in nature	Secondary appearance/ Framework
Openness / open and semi-open spaces	A space for nature watching, integration, presence, and interactions	Abstractive appearance/ Instinct & Disposition
Natural complexities	Use of complex natural structures	Abstractive appearance/ Instinct & Disposition
Natural forms	Curved and non-vertical lines	Abstractive appearance/ Instinct & Disposition
Natural structures	Structural systems derived from nature	Abstractive appearance/ Instinct & Disposition

3. Discussion

The spread of modernism, as well as political developments, structural changes in the second Pahlavi government, as well as the changing needs of society, have led to the emergence of new discourses and, as a result, the production of new architectural styles (Table 2). These discourses are manifested in the form of traditionalism, historicism, and modernism. Influenced by modern technologies and traditional discourses, nature has manifested itself in architecture through Islamic and geometric motifs through form and decoration. These motifs have been created from the propositions of reviving the history and culture of Iran and referring to the past under the influence of new discourses of each period (Table 3).

The presence of nature is symbolically manifested in the architectural works of this period with the help of unreal elements taken from nature in the form of Islamic and geometric motifs as well as decorative elements in the form of animals. The use of physical elements of nature in order to increase the energy efficiency of buildings has been considered in accordance with the type of use and usage restrictions (lighting, ventilation, heating, and cooling). Water is one of the physical elements of nature and a symbol of purity, freshness, movement, and life with deep roots in Iranian culture, and has a prominent presence in the works of this period. The modern view of this period and the social, economic, and political necessities of fast and cheap constructions changed the way we look at materials and the use of materials. Under the influence of modern Western architecture and the political, and social situation and architects' interactions in learning architecture, the groundwork was laid for the creation of an international style.

The use of curved and non-linear lines derived from nature in creating the form simultaneously with the political, social, and cultural developments in the last period of the second Pahlavi is a prelude to finding an organic style. Identifying and examining the hidden truths in the relationship between text and meaning (architecture and nature) based on the new power relations in this study shows the effectiveness and direct relationship between architecture and nature through the presence of components of a modernist, traditionalist, and historicist discourses; There is also an indirect relationship between text and context through the effects of texture on text.

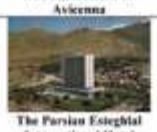
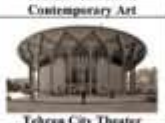
Table 2 Study of the structure, conditions, currents, and underlying factors in creating new discourses and its effects on the architecture of the second Pahlavi period. Reference: Authors Based on: (Afshari et al. 2020; Sultanzadeh et al. 2020; Haghjoo et al. 2020; Hassanpour and Sultanzadeh, 2016 p.39-52; Ghobadian, 2014; Sobat Sani, 2013; Bavar, 2009; Bani Mas'ud, 2009).

The architecture of the second Pahlavi period					
Era / **Period**	**Social and political conditions in Iran**	**Unprecedented discourses**	**Dominant tendencies**	**Architects**	**Superior architectural works**
Prime period (1941-1951)	*Economic and political crisis in the early years *Multiple shifts of unstable governments *Expansion of political and social freedoms with turmoil and instability *Continuation of the western renovation process *US support for Iran against the Soviet Union based on the Truman Doctrine *Modernization of cities, the need to use cars and urban streets, and the development and expansion of technology	- A modernist perspective - Fast and cheap construction - Nationalist perspective	Islamic architecture and traditionalism (Modern Iranian Architecture)	-André Godard - Maxime Siroux - Roland Marcel Dubrulle - Mohsen Foroughi - Hooshang Seyhoun	-Tomb of Hafez Shirazi - Faculty of Fine Arts (University of Tehran) -Tomb of Saadi Shirazi - The Mausoleum of Avicenna
Mid-period (1951-1963)	*Increasing US power and influence in Iran *Consolidation of Shah's political power and increase in oil revenues *Revealing differences between national and religious opposition *Increasing urbanity and the growth of higher education and increasing the middle-class population *The growth of artistic and cultural activities and the emergence of new schools of art *Land reform in the last years of this period	- Functional extraversion - High-rise buildings - Cube constructions	Modern architecture Modernity and renewal (Combining modern western architecture with Iranian historicalarchitecture)	- Raglan Squire - Mohsen Foroughi - Hooshang Seyhoun - Heydar Ghiai - Houshang Khanshaghaghi - Abdol-Aziz Mirza Farmanfarmaian - Kamran Diba	- The Parsian Esteghlal International Hotel - Central Building of Sepah Bank designed by Vardan Hovanessian - The Senate House of Iran - Jondi-Shapour (Shahid Chamran) University
Final period (1963-1979)	*The powerful command of the Shah and the increase in oil revenues *Economic growth due to rising oil prices *Suppression of religious dissidents *Attention to the West and ancient Iran in political discourse *Holding The 2,500-year celebration of the Persian Empire and changing the Solar Hijri calendar to the imperial calendar *Increase cultural and artistic activities according to national identity *Expansion of government plans and the crisis of migration to cities *Creating a gap between the ruling apparatus and the people due to the modernist actions of the government	-Mass Housing - Town design -Vernacularism and historicism -Finding a solution to the identity crisis -Tradition and modernity are equal to each other -Iranian modernist builder	Iranian quasi-modernist architecture (Modern Iranian architecture with a combination of tradition and modern architecture)	-Mohsen Foroughi -Hooshang Seyhoun -AmirAli Sardar Afkhami - Kamran Diba -Hossein Amanat -Nader Ardalan -Nezam Ameri	-Tehran Museum of Contemporary Art -Shahyad Tower -Tehran City Theater - Shafagh Park -Niavaran Cultural Center -Central Office of Behshahr Industrial Group -Mausoleum of Baba Taher -Shams Palace

The use of curved and non-linear lines derived from nature in creating the form simultaneously with the political, social, and cultural developments in the last period of the second Pahlavi is a prelude to finding an organic style. Identifying and examining the hidden truths in the relationship between text and meaning (architecture and nature) based on the new power relations in this study

shows the effectiveness and direct relationship between architecture and nature through the presence of components of a modernist, traditionalist, and historicist discourses; There is also an indirect relationship between text and context through the effects of texture on text

Table 3 Presence of nature in Iranian architecture during the second Pahlavi era

Attendance of nature design strategies in Iranian architecture during the second Pahlavi Era (1941-1979)																					
Architectural style	*Superior architectural works*	*Primary nature*				*Secondary nature*			*Abstractive nature*											*The manner of nature attendance*
		Nature framework							Instinct & Disposition of nature											
		Actual elements				*History elements*		*Elements with limited modifications*	*The fundamental feature of nature in the form and structure*											
		Plants	*Wind*	*Light*	*Water*	*Animal and plant motifs*	*Islamic and geometric*	*Traditional materials*	*Empty space*	*Unity*	*Curved and non-vertical*	*Repetition*	*Conflict*	*Rhythm*	*Symmetry*	*Hierarchy*	*Center*	*Axis*	
Persian architecture	 Tomb of Saadi Shirazi	+	+	+	+	–	+	+	+	+	+	+	–	+	+	+	+	+	1 .The use of physical elements of nature in order to increase the energy efficiency of buildings has been considered in accordance with the type of use and usage restrictions (lighting, ventilation, heating and cooling). 2. Water is one of the physical elements of nature and a symbol of purity, freshness, movement, and life with deep roots in Iranian culture, and has a prominent presence in the works of this period. 3. The presence of nature is symbolically manifested in the architectural works of this period with the help of unreal elements taken from nature in the form of Islamic and geometric motifs as well as decorative elements in the form of animals. 4. The modern view of this period and the social, economic and political necessities of fast and cheap constructions changed the way we look at materials and the use of materials. 5. Under the influence of modern Western architecture and the political, social situation and architects' interactions in learning architecture, the groundwork was laid for the creation of an international style. 6. The use of curved and non-linear lines derived from nature in creating the form simultaneously with the political, social and cultural developments in the last period of the second Pahlavi is a prelude to finding an organic style.
Brutalist	 Faculty of Fine Arts (University of Tehran)	–	–	–	–	–	–	+	+	+	–	+	–	+	+	+	+	+	
Sculpture (inspired by the Qubbos dome style + Razi style)	 The Mausoleum of Avicenna	–	+	+	+	–	+	–	+	+	+	+	–	+	+	+	+	+	
International Style	 The Parsian Esteghlal International Hotel	–	–	+	+	–	–	–	–	+	–	+	–	+	+	+	+	+	
Art Deco	 Central Building of Sepah Bank designed by Vardan Hovanessian	–	–	–	–	–	–	+	+	+	–	+	–	+	+	+	+	+	
Modern architecture	 The Senate House of Iran	–	–	+	–	–	–	–	+	+	–	+	–	+	+	+	+	+	
Eclectic (Traditional Iranian Architecture + English Neo-Brutalism)	 Tehran Museum of Contemporary Art	–	+	+	+	–	–	+	+	+	+	+	–	+	+	+	+	+	
Eclectic (capital inspired by Ilkhanid architecture + plan inspired by Greek and Roman architecture)	 Tehran City Theater	+	–	–	+	–	+	+	–	+	+	+	–	+	+	+	+	+	
Organic architecture	 Shams Palace	–	+	+	+	–	–	–	+	+	+	+	+	+	+	+	+	–	
Meaningful components: the direct relationship between text and context through the presence of ruling components on the discourses of modernism, traditionalism, and historicism. ***Indirect relationship of text and context through the effects of texture on text.***																					

4. Conclusion

The present study shows the direct relationship between the dominant discourses of society and the evolution of style and architectural approaches. Much of contemporary Iranian architecture is rooted in the theories and views of architects developed in earlier eras based on common discourses on society in each period and the interactive relationship between power, wisdom, and knowledge in the architecture of that period, so knowing the approaches and discourses of that time It is suggested to continue the route or change the possible route.

At the beginning of the second Pahlavi period, even though traditionalism and Islamic architecture were the dominant trends, modern discourse and opposition to traditionalism emerged and the symbols of historical Iranian architecture lost their importance in designs. With the opinion that a nation alone cannot rely on its past. Rather, we should look at the present and the future, because everything in nature is evolving and progressing, and architecture is no exception to this general principle. It is possible to achieve good results in architecture by modernizing it without blindly imitating the old style; Therefore, the abstractive nature appearance is manifested in the works of this period. In this period, the manifestation of nature has been witnessed in different forms in architecture. Nature has always attracted the attention of architects in different ways, and by simplifying, separating features, and sometimes the geometry of shapes, it shows it with a human definition. As a result, it can be acknowledged that the abstractive appearance of nature has always been the special attention of architects in this period. In 1941, the secondary appearance and especially the abstractive appearance were considered. But with the passage of time and in the years 1943 to 1952, the attention of architects has been drawn to the original appearance of nature and the use of natural elements in a pristine form. This special attention to the primary appearance of nature continued until 1970. In the years 1970 to 1979, we see nature's secondary appearance becoming more prominent in architectural works (Fig 4 and 5).

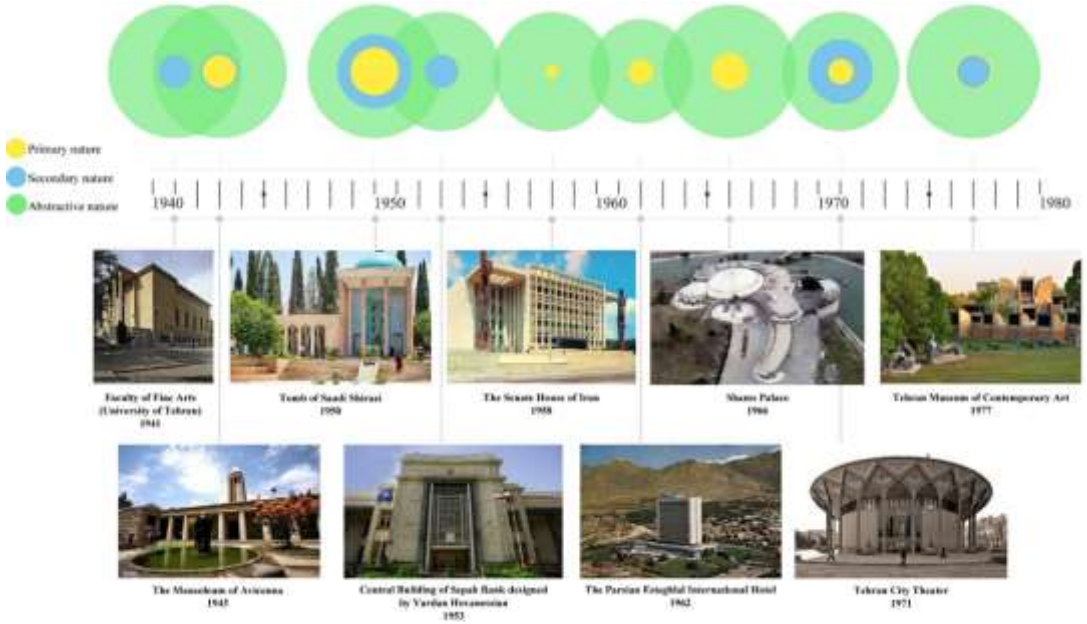


Fig 4 Attendance of nature design strategies in Iranian architecture during the second Pahlavi era (1941-1979)

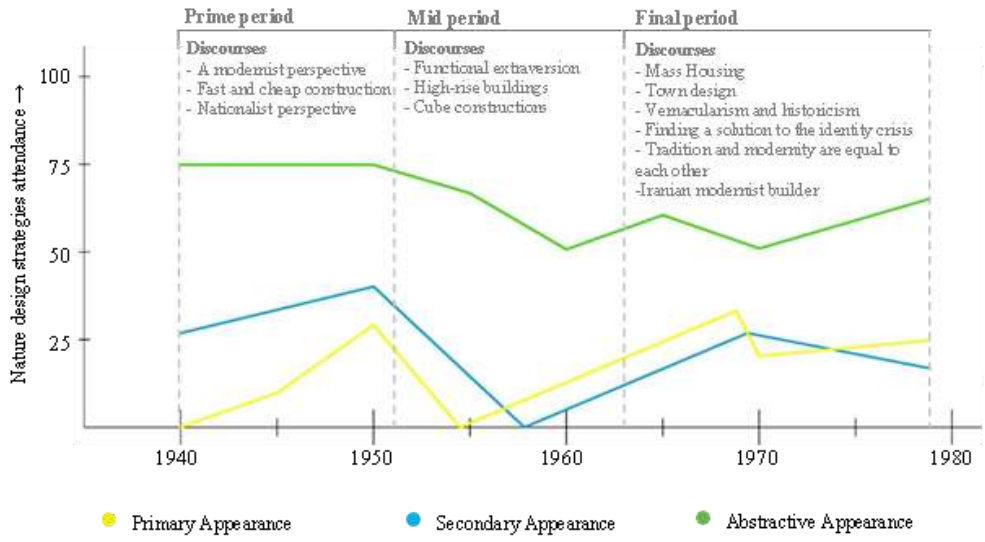


Fig 5 Unprecedented discourses, and the manner of nature design strategies attendance in Iranian architecture during the second Pahlavi era

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Deigning Cultural and Entertainment Complex with an Emphasis on Sustainability (Case Study: Yazd, Iran)

Atefeh Fathi[a], Ali Boloor[b]*

[a]*Department of Art and Architecture, Faculty of Architecture, Yazd Branch, Islamic Azad University, Yazd, Iran*
[b]*Department of Art and Architecture, Faculty of Architecture, Yazd Branch, Islamic Azad University, Yazd, Iran*

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Research Article

Abstract

Today in society we see problems related to young people and being away from their families. The residents of this city are always dissatisfied with the lack of comprehensive entertainment and cultural places. Increasing entertainment for young people, families and immigrants is one of the requirements of Yazd city. Also, every year we witness the warming of the earth, the reduction of non-renewable resources, the damage of the ozone layer and the influence of alien architecture. In this research, the design conditions of a cultural and recreational complex in a hot and dry region were studied with a sustainable architecture approach. The principles of sustainable architecture and the principles of a happy recreational place were investigated according to the climate of Yazd city. The purpose of this research is to increase people's vitality and entertainment, revive culture and preserve the authenticity and identity of the global city of Yazd, promote and encourage local architecture and pay attention to sustainable architecture that reduces environmental problems. For this purpose, the necessary solutions are provided by stating the relevant definitions, analyzing similar experiences, examining 4 domestic and foreign case examples, as well as knowing the climate and introducing the city of Yazd. According to the researches and library studies done, the results show that, with the help of the renewable energy potential of Yazd city, local materials, bright color and high heat capacity, ventilation and natural light, water purification. And its reuse, the creation of recreational places with a sustainable architectural approach resulting in a healthy communities, strengthening the family foundation, reducing depression and medical services, reducing justice services, crime, and also increasing the speed of construction, reducing construction costs and sustainability.

Keywords: Design; Culture; Recreation; Sustainable Architecture; Yazd

* Corresponding author. Tel: +98-9132747198.
E-mail address: buloor@gmail.com

1. Introduction

Every year, a large number of non-residential buildings are designed and implemented in Yazd. which mostly has an administrative, commercial aspect or buildings with foreign facades that confuse the culture of Yazd city. The city of Yazd is the first historical city of Iran and registered in the UNESCO World Heritage List, so it is a kind of architectural portal under the microscope. The whole world knows Yazd as a clay city. The buildings of this city should follow the local climate and materials to a large extent. This is how the identity of the global city of Yazd is always preserved and strengthened from the past to the future. Today, the architecture of every city is usually questioned because the contemporary architect has stopped justifying his work and the owner wants a special building with modern architecture. It is the duty of each of us to look at the sustainable architecture and climate of the region to a significant extent in our work. In this case, in addition to preserving the city's identity, construction costs and environmental problems will be reduced.

According to the traditional architecture of Iran, complexes such as Persepolis and Chaghazanbil in ancient Iran, elements such as aqueducts, mills, glaciers and villages such as Mibod, Kandavan, Masuleh and other such things are only one of thousands of examples that the seal They confirm the claim that sustainable architecture and its principles have existed in the land of Iran for centuries, and that architecture is not new or novel (Ahmadi, 2013).

The effects of the age of communication and industrialization of societies on architectural spaces are quite evident. Every day we see different forms and designs in architecture, designs and forms that may be made according to a series of conditions and conditions or without considering special conditions and simply because of interesting forms or imitations. But today, due to the shortcomings and problems we are facing in the field of conservation and optimal use of energy, as well as attention to the optimization of architectural spaces and the change in our functional needs from architecture, we must move towards a new definition of creating sustainable buildings. (URL1) From the innovative aspects of research, we can mention the interaction of culture and recreation in Yazd along with sustainable architecture, which itself reduces environmental problems. It is also possible to deal with the interplay of modern and traditional architecture using the new form and native materials of Yazd province. To better understand the subject and design more intelligently, we must better understand the concepts of the subject, so we briefly discuss the definitions of the words culture, recreation, vitality and sustainable architecture.

Culture: The word "culture" is formed from the combination of "Far" + "Hang", "Far" means shock and glory, and stepping into excellence, and "Hang" means understanding, awareness, and gaining (Flamaki, 1992: 137; Guderzi, 2014). Flamaki says in the book Experiences of Iran and the West: Culture represents a certain way of life (in a group, the people of the period or humanity in general); as well as the description of intellectual works and experiences that are especially aimed at artistic activities. The use of the word culture in virtual concepts has given different meanings to this word in different languages (Flamaki, 1992). Jacob Burkhardt: The three great powers that have determined the reality of human existence and the course of history are: religion, government and culture. Allameh Mohammad Taqi Jafari Tabrizi: Culture is a quality or a way that is necessary or appropriate for those activities of the material and spiritual life of humans, which is documented in the way of sound reasoning and their exalted feelings in a rational, evolutionary life (Jafari Tabrizi, 2012). Danny Kosh: Culture or civilization, in its broadest anthropological sense, is the complex whole that includes cognitions, beliefs, art, ethics, rights, customs and other abilities or habits acquired by humans as members of society. is included (Danny Kush, 2002). According to

another definition: culture includes all the habits of a society. Or if we consider society as a collection of organized people who have a certain way of life, then culture means this way of life.

Recreation: It includes activities that are usually chosen by a person specifically and voluntarily because of the satisfaction and pleasure they seek or for the purpose of some personal and social values that are expanded from it (Azerkhosh, 2008: 15). This activity is for free time and has nothing to do with one's main job and is usually enjoyable. Fun does not include what a person does, but rather the motivation of the state and the value of what a person does as fun (Ibid, 17). Recreational activities that take place outside the home are mostly cooperative and collective, which require special space and facilities. In this regard, public spaces play a major role in providing the basis for the formation and coherence of such activities.

Definition of vitality in the dictionary of Dehkhoda, vitality is defined as "to be cheerful, to be lively" (Dehkhoda, 2007). Vitality: the life of an individual is in the midst of being together, and what gives life to a space is the people and their active and enthusiastic presence in the space. In order to achieve a living city or liveliness in the city environment, places and situations must be provided to create lovely experiences. Our main goal in defining the landscape skillful intervention in the urban elements so that by placing pleasant views next to each other, the city become livelier. The variety of activities that occur in a place 24 hours a day, seven days a week, is an indicator of the vitality of the place (Abbas Abad and Yusuf Zamani, 2021). Vitality and livability: There are various equivalents for the concept of vitality in the West, among which live lines livability, vitality, viability can be mentioned; Of course, the other words for "vitality" are mostly the concept of livability and livability. In the urban dictionary of Robert Cowan (2005, 442), vitality and livability come together and this is the meaning of "vitality and viability" lively urban space. According to the definitions given in relation to activity and vitality, a lively urban space is an urban space in which the presence of a significant number of people and their diversity in terms of age and gender in a wide time span of the day, whose activities are mainly selective or social update is visible (Moradi and Zandieh, 2014).

Vitality components according to Afshar, there are 7 different criteria for evaluating vitality: 1) Beneficial density of people 2) Diversity 3) Accessibility 4) Safety and security 5) Identity and differentiation 6) Cooperation and communication 7) Creativity (Afshar, 2013: 6). Mohammad Javad Moradi and Mehdi Zandieh, by examining three recreational cultural complexes at the international level in their article, called the vitality components "useful density, diversity, accessibility" (Moradi and Zandieh, 2014).

Table 1 Summary of definitions of vitality from different theorists (Samari and Taban 2013).

Definition of vitality	year	book	Theorist
A place for useful interactions and actions between people	1961	Death and life of big American cities	**Jane Jacobs**
The degree of compatibility between the environment and people's activities	1987	Creation of architectural theories	**long**
The possibility of living comfortably in a city	1987	Towards a Design Manifesto	**Alan Jacobs and Donald Abliard**
Harmonizing the environment with human biological needs	1981	The theory of good city form	**linch**
The identity of having a social life in the city	1997	Seven goals to reach the city	**Salzano**

Yazd metropolis is one of the cities in the central provinces of Iran. It is the first raw clay city in the world and the second historical city in the world. It is also the second historical city of Iran after Bam and registered in the UNESCO World Heritage List. Yazd literally means pure and holy place of worship. Among the famous names of Yazd, we can mention Badghirah, Daral-e-Abada, Hosseiniyeh Iran, Shahr Do-Cherkha, Shahr Shirini, Shahr Qanat, Qanot and Qanaat, Shahr Atash and Aftab. Shahrizd is also one of the medical and cultural centers of Iran. (URL2) Yazd region Yazd is located near Dasht Koiro, Dasht Lot, a dry and wide valley, between Shirkoh and Kharanq mountains. The climate of Yazdaz province is hot and dry, which can be divided into two subtypes according to the role of local factors. A - Mountain areas with mild summers and relatively cold and long winters; B - Lowland areas with very hot and dry summers and short winters (Organization for Research and Educational Planning, 2017).

Sustainable Architecture Sustainable architecture is an architectural philosophy that pays attention to economic, social and cultural aspects at the same time, and in fact, with this type of architecture, we invite nature into our homes. Sustainability means resistance, resilience, standing, persistence with durability, lasting stability, and actually that which can continue in the future. Something that remains constant. This term is widely used today to describe a world in which human and natural systems can coexist until the distant future (Bahreini and Maknoon, 2010). In the Latin language, sustainability is mentioned under these titles: The verb sustain means to keep something for a while without diminishing and it means to keep and preserve. The adjective sustainable means using natural products and energy in a way that does not harm the environment. This adjective describes something that soothes, nourishes, and sustains life, thereby prolonging and prolonging life (Ahmadi, 2013). Sustainability is sustainable quality. It is defined in the Cambridge Dictionary as: "the quality of being able to continue over a period of time". Therefore, sustainability is the quality of temporal continuity, without changing its specific characteristics, and it can be associated with numerous natural, social, political or economic phenomena (Ballestar, Cuerdo-Mir, and Freire-Rubio, 2020). In general, there are three main elements in the definition of sustainability: 1. Improving the quality of life and health of humans (current and future generations) 2. Providing daily human needs 3. Preserving ecological systems and energy resources (Khanbanzadeh, 2014).

The necessity of sustainable architecture in the long run, sustainable design is not an option, it is a must. Earth, with its 6 billion population, is rapidly approaching the Big Shock. Humans are easily covering the planet with human beings. We are destroying our water and soil resources and we are destroying biodiversity; we have polluted the soil; the air and we have changed the climate with potentially disastrous results (Holloway, 2000). Energy conservation: Every building should be designed and built in such a way that its need for fossil fuel is as low as possible. Working with the climate: Buildings should be designed to be able to use the climate and local energy sources. Reducing the use of new resources: Every building should be designed in such a way as to minimize the use of new resources and at the end of its useful life, create a resource for creating other structures. Respect for users: the interior design should be such that they reach the comfort point with the lowest cost. Respect for the site: every building should be placed on a calm and light ground without destroying the natural resources of the site (URL1) The principles that must be followed in order for a building to be classified as a sustainable building are as follows: First principle: energy conservation, second principle: harmony with the climate, third: reducing the use of new resources, fourth: meeting needs, fifth: harmony with the site. Sixth: Holism (Khanbanzadeh, 2014).

Table 2 Sustainable architectural design from the point of view of contemporary architects in brief (source; Ahmadi, 2013)

Sustainable design means maximum efficiency with minimum tools	**Norman Foster**
Coordination with the ecological systems of the planet, the least negative impact of construction materials and energy consumption on the environment with the least waste of resources.	**Ken Young**
Protecting natural resources using renewable energy, especially solar energy	**Thomas Herzog**
The main point in sustainable design is the choice of materials and the performance of a building under construction.	**Yan Kaplicki**

Table 3 Principles of sustainable architecture according to world architects (Source: Ahmadi, 2013)

Resource saving, reuse and recycling of natural resources, design based on the life cycle, design based on the interaction between humans and the natural world	Principles of Jin, Kim (1998), Jong-Jin)
Thinking small, heating the building with the sun, maintaining comfort and convenience, using renewable energy, saving water, using local materials, using natural materials, preserving natural forests, using recyclable materials, making sustainable, food production Self, maintenance and storage of your food	Usul Kelly and Rozana Hart (Sefalai, 2013)

Conservation of energy, harmony with the climate, reducing the use of new sources of materials, meeting the needs of residents, harmony with the construction, totalism	Principles of Brando and Robert Vale, (Vale, and Doig,1997)

2. Theoretical Foundation

The four case studies carried out were at national and local level

2.1. Mashhad Mountain:

One of the best and most famous entertainment and tourist attractions in Mashhad, it has 5 floors and a height of 20 meters on one of the roofs of the holy city of Mashhad. It has modern architecture and is one of the best and largest sports and tourism centers, not only in Mashhad but also in the Middle East. It is located in an area of 50,000 square meters. Due to the location of the hilltop land on the route of the airline, the design has been done in such a way that the top view of the complex can be seen completely from inside the plane and it will attract passengers and also beautify the aerial view of the area, in fact, this complex has a fifth view.

Spaces: All kinds of games and emotional-sports activities

- The most luxurious restaurants exciting games such as skip room, laser tag, escape room, paintball playground
- Bowling halls, billiards, gym, computer games
- Multi-purpose and equipped halls for celebrations, weddings, conferences, etc.
- Hydrotherapy complex, massage, sauna, swimming pool, jacuzzi, squash, multi-storey parking (7 floors), outdoor tennis court and multi-purpose halls (bodybuilding, basketball, volleyball, etc.) (URL3)

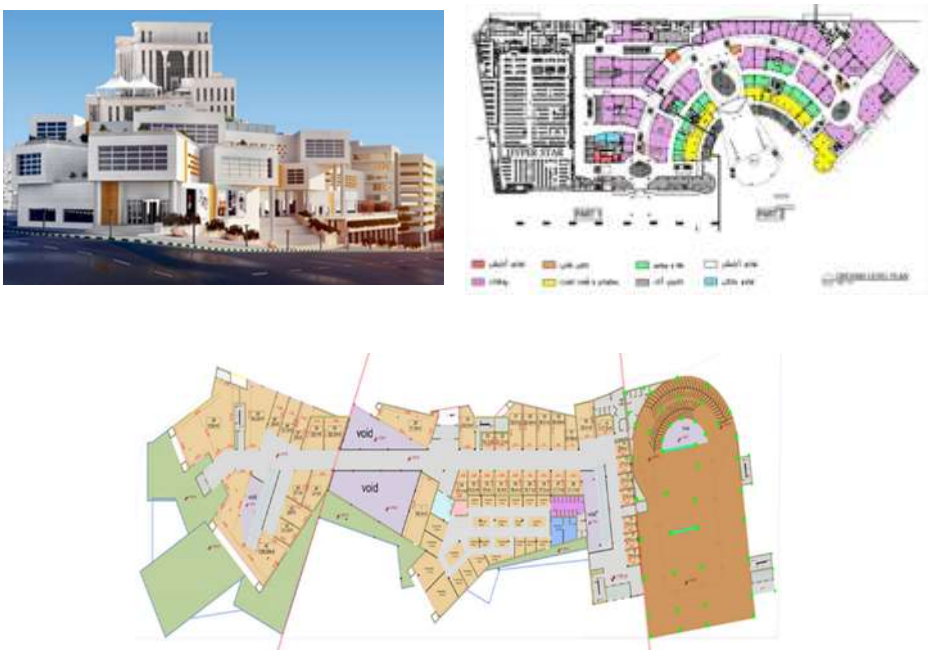


Fig 1 Mashhad Mountain floor plan

2.2. City Center Isfahan

It is one of the largest commercial complexes in Iran and the seventh largest shopping center in the world. "Prestige land Iran" company, with foreign and domestic investment, using experienced Iranian and non-Iranian architects and specialists, both of whom have many international records and experiences, built this complex and named it a small city in the heart of Isfahan. will be remembered It will receive tens of thousands of domestic visitors and foreign tourists every day. This land with an area of 150,000 square meters is located in the beautiful mountains and southern plains of Isfahan. Its design is such that the sunlight shines with special gentleness from a huge and beautiful glass roof to the central hall to make it possible to observe the beautiful sky of Isfahan from inside the complex. which will be connected to other common towers, office towers and apartment hotel by a beautiful glass bridge which is taken from the historical design of Iranian markets. A luxurious 5-star hotel with all the facilities and standards of a 7-star hotel and with the most modern architecture in the world will be built and connected to the main area of the complex.

Spaces: Commercial complex: 750 units, branded stores in Iran and the world, luxurious restaurants, airline offices, bank branches, prayer rooms, etc.

Hotel: 400 rooms, 5-star international hotel including sports halls, amphitheater, special suites, single and double rooms, special suites for meeting and conference halls, special helicopter landing pad, etc.

Hypermarket: large sales centers (chain stores) Entertainment and cinema complex: 10 theaters, movie theaters, children's playrooms and computer games, toy city and...

Green space: green space, large water features, dance of light and water, etc.

Roofed parking: 5500 cars, facilities, warehouses and V.I.P car maintenance services (URL4)

2.3. City Center Dubai:

natural and artificial lighting, with two entrances; The main entrance and the entrance of the parking lot, creating pause spaces in the main traffic routes.

Spaces

Bank, bookstore, hypermarket, game and entertainment, services, restaurant, cafe and fast food, specialty stores, commercial stores such as jewelry, clothing, toys, sports equipment, etc. (URL5)

Fig 2 City Center Dubai

2.4. Spacomer Complex South Korea:

Located in Seoul, South Korea. It was built in 2014 with an area of 253 square meters and its architects are Kim Dong and Jin. Among the features of this building, we can mention the following: flexible and absorbent horizontally and vertically, with different and contradictory spaces such as office, store, residential, restaurant, etc. Now that the street has different uses in the 21st century. begins to consume, now it has become a place with different cultures. Different street programs are constantly expanding and creating new places, which are expanded from the concept of different communities in a one-dimensional view, showing the possibility of revitalizing the city. Using urban culture is already proven. In order to overcome and use the characteristic of Sangsu-dong, which is located in the center of the alley, we tried to expand the street in three dimensions by moving the elements horizontally and vertically for urban freshness. By juxtaposing the yellow wall, the floating mass and the stair track and mixing them together, Spacomer became a place to fetch (absorb), and instead of strongly stimulating the consumption of consumer goods in the standard stalls that occupy the street, Spacomer it works. It is a place where consumers can walk on the street enjoying the space (URL6).

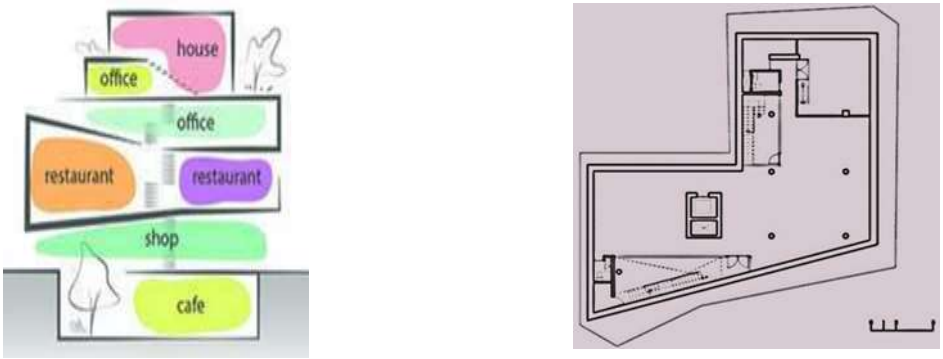


Fig 3 Floor plan and vertical section of Spacomer Complex South Korea

Table 4 Summary and analysis of positive and negative points in the sample cases (source: author)

Weak points	Strengths	Projects	Row
1- Being far from the city center 2- The luxury and size of the complex (which causes the expensiveness and decrease in the attraction of average people) High construction makes it difficult to access the material and increases the cost.	1- Great diversity and attractiveness of entertainment spaces 2- Placement in an area with good weather 3 - Attractive view 4- Having friendly and family fun 5- Positioning in airlines and paying attention to the fifth dimension and attracting passengers 6- Attracting domestic and foreign tourists	Koh Sar Mashhad cultural and recreational complex	**1**
1-Access route, far from the city center 2-Excessive optimism about the exploitation of the entire complex	1- Attention to the interests and tastes of all ages 2- Diversity in recreational and user options 3- Proper invitation at the entrance 4- Paying attention to the tradition and culture of the city with the presence of the gallery and handicrafts 5-Modern and excellent interior design in the commercial sector 6-Unique volume and appearance design	Isfahan City Center	**2**
1-Inappropriate and unattractive architecture considering the title and city of the complex	1-Adequate and varied circulation and pause space 2 -Create multiple entries for ease of access 3-A lot of use of natural light in the lobbies 4-Diversity in interior design and flooring 5-Variation of area for stores	City Center Dubai	**3**
1-Improper and uniform interior design	1-Separation of various spaces 2-Readability of the plan	Spacomer commercial and cultural complex in South Korea	**4**

3. Research Method

At first, articles, books and theses related to the subject were searched, studied and reviewed. The required information has been collected using documents and through detailed library studies and field observations. After collecting and studying information through articles, books, internet, observing and examining the relationship between variables, understanding and examining concepts, comparing and analyzing multi-purpose complexes at the national and international level, climatic and indigenous studies of Yazd, examining design standards. Visiting the desired site and analyzing its potentials and presenting documents, pictures and maps, conclusions were made and the results were presented in tables. Also, we tried to use the strengths of the architects' designs and opinions and vice versa to avoid their negative points in the design. Because using the experiences of others brings us to the goal of design faster. The current research is in a descriptive-analytical qualitative method. At first, the specific idea, concept and design started with several preliminary studies. From the alternatives one was selected and the final plans, elevations, sections and dimensions were formed. The initial design process is shown in (Fig 4). From the alternative diagram the number 2 alternative was selected and further it was enriched to reach the final design.

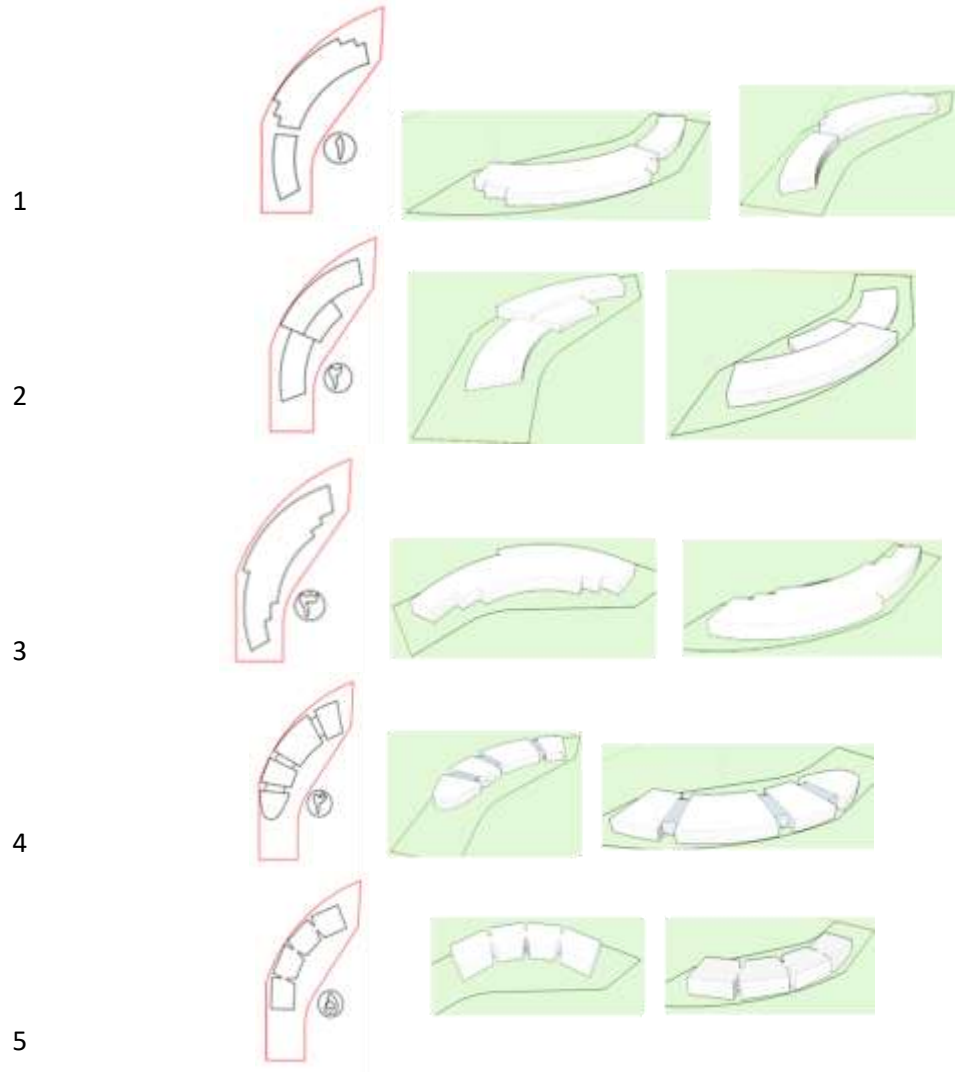


Fig 4 Alternative design process

3.1. Spatial design

Space planning process and diagram design

Note: The things that should be addressed at the beginning of the design in the general diagrams are: the location of the lobbies, the number of required lobbies, the entrance and exit of the site and the building, the corridors, the connection and lack of connection of the lobbies, the useful and correct location of the elements. Vertical communication.

The ***first step***: The approved primary sketch which is circular, with the help of the center of a circle and its radii. ***Second step***: Then we moved the left arm to the center of the circle due to better lighting and asymmetry in the arms of the design. The ***third step***: determining the location of lobbies and vids. The space consists of a main trapezoid and two left and right arms, which are designed almost separately but adjacently. So, each of them needs their own lobby. For better design, ease of access and reduction of wastage (distraction) of the area, they are placed in the center of each section. ***Fourth step***: Due to the multi-purpose space and their relationship with each other, they must be connected or even visible to each other, so we have placed long corridors. The use of long corridors helps us a lot in times of crowding. ***Fifth step***: Identify the entrance and exit of the building and to do this, we must first design the general diagram of the area. To determine the entrance and exit of the site in the best possible way, we must consider the ease of access to the building and parking lots on foot and on foot.

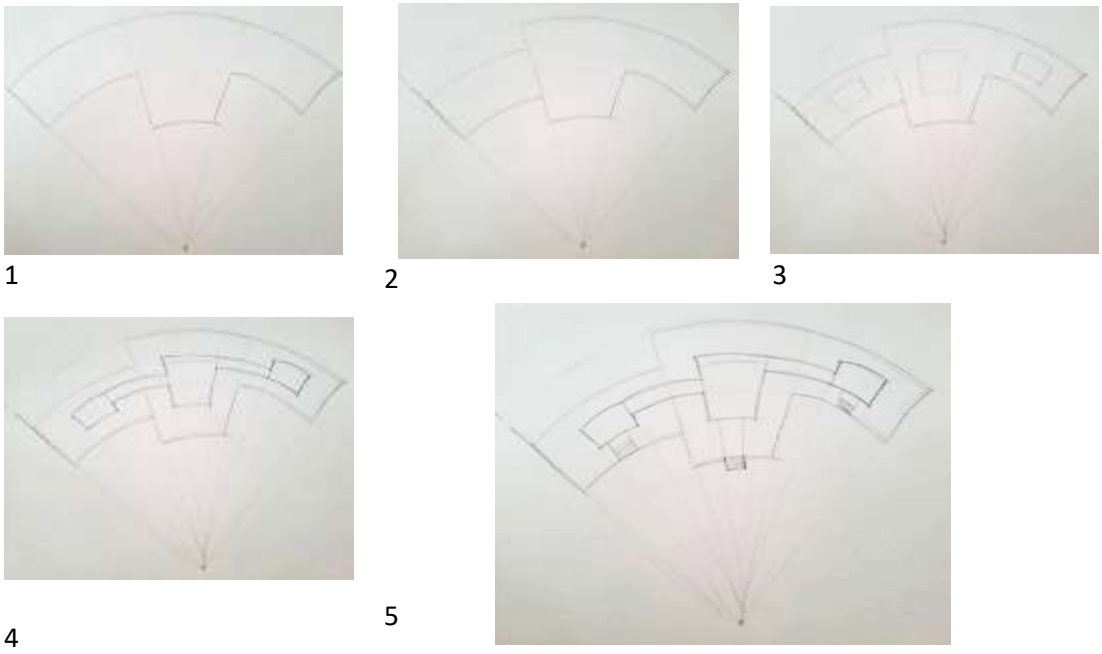


Fig 5 The five steps for space planning process

4. Designing phase for the complex

Due to having different spaces, it is necessary for each section to have its own entrance. Because some users refer to only one section on a daily basis. The central area of the main trapezoid was allocated to vertical communication elements for better access to each section and parking, reducing the occupation of a lot of space, as well as the accumulation of different floors in one area.

In the main trapezium, the entertainment space is designed, because as the main space of the complex needs more area. This space is allocated with snooker and bowling for entertainment spaces, because according to studies, these spaces should be located on the ground floor or basement due to the heavy live and dead load of the furniture. The educational spaces were placed in the north arm for ease access and receive the north light. Adjacent galleries and education space was a good choice because educational items in the education department can be displayed in the galleries quickly or visiting the galleries can lead the minds of the teachers to be creative. The amphitheater or cinema section should also have a separate entrance and be adjacent to the main exit of the site due to crowding at the entrance and exit, so the south arm of the diagram was chosen for it. Also, this space needs a large lobby for waiting and gathering. It is necessary to place toilets near the amphitheater and almost in the center of the main building.

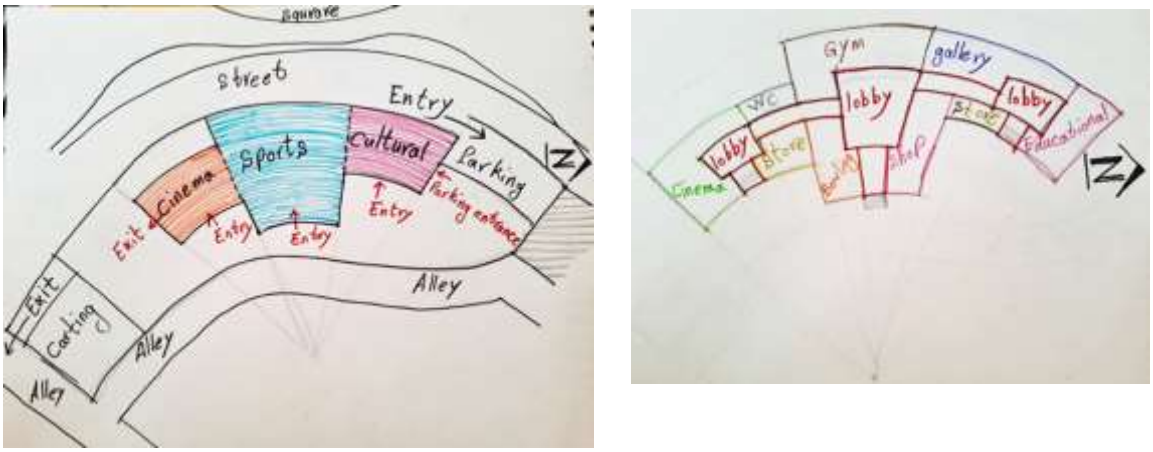


Fig 6 Ground floor plan

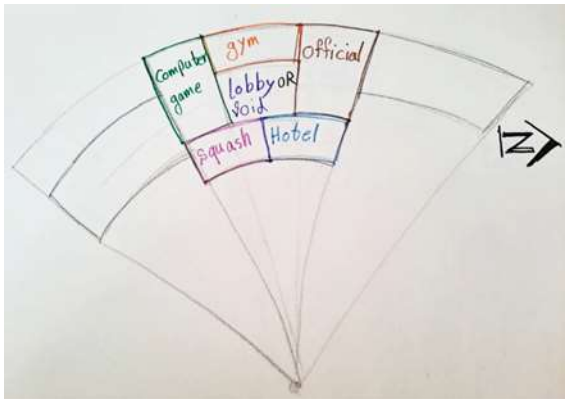
First Floor: The administrative part of the complex is located on the first floor and in the corner of the main trapezoid, which has a good view of the square next to the site and also has direct access from the parking lot through the elevators.

Note: Due to our chosen concept, which was supposed to be a shown due to the location of the site in the vicinity of one of the main squares of the city, we allocated more area of the site to the green space and expanded the spaces in the floors. Other entertainment spaces are located on the first floor and have a good view of the square. Also, in the center of this floor, we created a window that has a good view of the ground floor due to the lighting of the ground floor lobby and the spatial communication and communication of users from different floors to each other, this also brings vitality and increases the happiness of the space. And on this floor, the lobby is placed in the form of long, round corridors

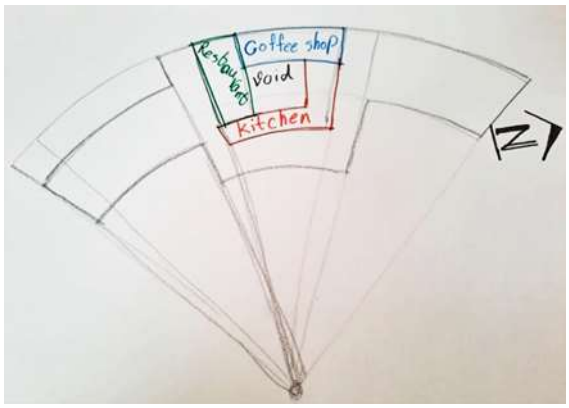
Second Floor: The coffee shop and restaurant, which are more service-oriented and also cause odor pollution, were placed on the last floor. Access to kitchen raw materials is also available through a separate elevator from the parking lot to the second floor. The garden and its surrounding lobby are repeated on the first floor and on the second floor. The second floor also includes terraces and large roof gardens for serving coffee and food in the open air.

Basement Plan: Pools, parking and facility rooms were placed in the basement due to the large area and lack of natural light. The most important point was the entrance of the cars to the parking lot from the entrance. They were guided inside with a circular movement. The next option was to

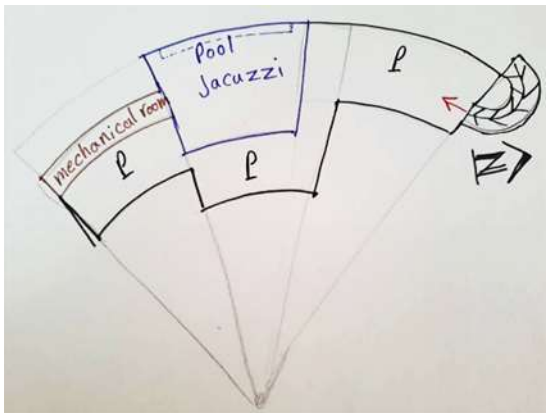
adjoin the facility rooms to the pool area and the main docks. The exact location of the stairs and elevators was chosen from the ground floor and basement. The main ducts were placed next to the elevators for ease of design and to avoid disturbing the vertical spaces. Another side staircase was placed at the end of the south arm, which is for the exit of the cinema users. By means of these stairs, they are easily led from the exit lobby to the parking lot and out of the site without creating traffic. Also, we created an indentation on the side of the tangent of the field, in order to add brightness to the pool area, which continues to the last floors (in dashed line) has been shown in the Fig 7.



First floor plan



Second floor plan



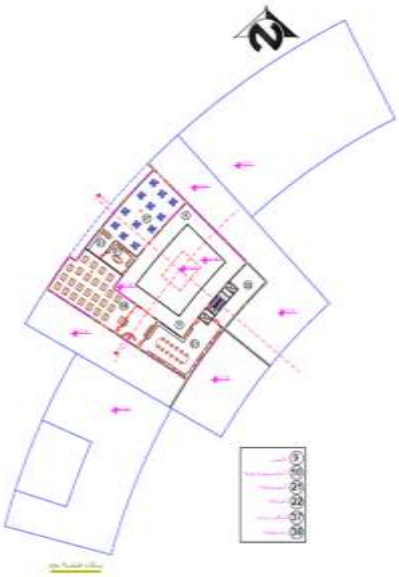
Basement plan

Fig 7 Allocating the space

The final floor plans were drawn as follows

Ground floor plan:

First floor plan



Second floor plan

Basement Plan

Roof plan

Fig 8 Final floor plan for the complex

Site plan

Section

Entrance Elevation

Bird s eye Pers epe ctiv e

Perspective of the complex

Fig 9 Rendered Perspective of the complex

5. Conclusion

The design of multi-purpose cultural and entertainment complexes was designed to achieve several purposes. Perhaps today, if these complexes or any other architecture is based on sustainable architecture, we can greatly reduce environmental problems and the use of non-renewable energy. With the mentioned studies, experts in the field of recreation, culture and sustainable architecture confirmed the role of recreation in improving life, work, society, and also the effects of sustainable architecture, which leads to the reduction of environmental problems. The belief is that proper recreation areas reduce the depression and other diseases, crime, justice services, and there is a better social interaction between family members and members of society. Vernacular architecture, based on research, can be said to be a main branch of sustainable architecture, which preserves non-renewable resources and reduces environmental problems. We can easily have a beautiful, sustainable and attractive designed spaces for people by following the basic and common rules in respective climatic regions. According to the conducted studies, it can be said that the principles of sustainable architecture are almost the same for all climates and geographical locations, and it is not difficult to pay attention to those principles in design.

Table 5 Rules and patterns of interior and exterior design (source: author)

Solution and method	Property	Space names
By indentation, protrusion, head height	Caller	Entrance
Readability, placement in the most convenient part of the site and streets for entry and exit, without creating traffic	Easy accessibility	
Creating pause spaces for each section: for rest, waiting, gathering. Large area, high height, special and attractive lighting, special furniture	The turning point of the collection	Main lobby
Increasing the number of cinemas in Yazd, especially in that part of the city that does not have a cinema.	Cinema	Multipurpose hall
Contributing to the diversity of recreational spaces		
The increase of amphitheater halls, especially in this area of Yazd	Amphitheater	
A place to hold conferences and events for public and private organizations and ordinary people		
For quick entry and exit without crowding of multi-purpose hall clients	Separate input and output	

Connecting and combining different spaces with each other Pulling and attracting people present in one space to other spaces	Adjacent to other entertainment spaces	
Bringing vitality, increasing the quality of the complex, attracting better and more people of different age groups Spaces such as: clubs, billiards, bowling, karting, competitions, computer games, cinema, parks and green spaces.	Variety	Recreational spaces
High capacity of spaces due to reduction of congestion and fatigue	multiplicity (capacity)	
Such as: karting, bowling, billiards	Special and rare entertainments of Yazd	
Galleries, exhibitions, popular training classes, multi-purpose hall	Variety	Cultural spaces
Due to the lack of crowding and responding to all people	High capacity	
By big windows and good view	Dramatic character	restaurant and coffee shop
Placement at height (the last floor of the building)		
Promotion of cooking and serving traditional foods and teas and spirits Traditional and local uniforms of the personnel	Promoting the former cultures of Yazd	
Use the balcony for variety and open space	Closed and open space	
Placement at the entrance	easy access	Parking
Open parking: yard	Variety	
Closed parking: basement next to swimming pools		
Also, a part of the basement parking should be reserved for the personnel of the complex.	Personnel parking	

Planting a lot of low-water trees suitable for the city's climate, greenness and freshness of the atmosphere, coolness and shading, increasing oxygen	Tree	green space
It causes coolness, harmony and freshness in the atmosphere.	Water pond and fountain	
Creating a feeling of comfort, enclosure and interaction between people	Gazebo	

Table 6 Sustainability options in the collection (source: author)

Description	**Property**
The use of suitable windows for maximum natural lighting that reduces the building's electricity consumption.	Natural lighting
Using high windows on the south side to increase the heat of the sun in winter.	
Using low windows on the north side to reduce cold winter winds	
North, east and west windows and openings should not be considered large, because the large area of the windows increases the heat load in summer and the cold load in winter.	
Using natural and correct openings for natural ventilation of the building, especially in the summer season, for proper cooling and ventilation.	Natural ventilation
Even if possible, use the opposite openings for cooling and natural ventilation of the air inside the building.	
If possible, use a fan for cooling and ventilation.	
The reuse of purified water leads to the reduction of water consumption in the building.	water refinery
Reuse of drain water obtained from cooling and heating devices for flush tanks of the complex and irrigation of green spaces	
Use proper and regular irrigation methods.	drop irrigation
Cost-effective irrigation methods such as drip irrigation for the green space of the	

complex.	
Using local materials of Yazd province, due to cost reduction and ease of access. The use of colored glass to control sunlight and the interference of modern and native Yazd architecture.	Use of local materials
Also, the use of materials with high heat capacity and light color will reduce the heat inside the building in the summer season.	

Table 7 The benefits of recreational cultural complexes (multi-purpose) with a sustainable architecture approach (source: author)

Reason	Benefits	Row
With increased fun and freshness	Reduce depression	**1**
By promoting group exercise	Reducing other diseases, increasing health	**2**
With the increase in youth entertainment, that too collectively	Crime reduction	**3**
By increasing family fun and increasing interaction and happiness between family members	Reduction of justice and divorce services	**4**
With safe and sufficient parking spaces Despite the closed and safe spaces for individual recreation of each family member, especially children	Increasing the sense of security during recreation	**5**
By spending time in comprehensive entertainment complexes	Reducing the use of virtual spaces and the disadvantages of using them	**6**
For personnel working in the complex	Employment and income generation	**7**
Private and government sector investment in the construction of such complexes	Investment	**8**
Because of entertainment, culture and traditional architecture	Attracting domestic and foreign, native and non-native tourism	**9**
By attracting tourism from outside Iran	Attracting capital and currency to	**10**

	the country and the city of Yazd	
By creating freshness and movement factors in the collection	Increase vitality and mobility	**11**
By being in one place and solving different needs	Save time and energy	**12**
Despite the parking, walking and diversity of the collection	reduction of traffic	**13**
Despite the variety of spaces for different ages and the proximity of spaces in a building	Parental supervision of children's entertainment	**14**
By reviewing and revitalizing clothes, crafts, food and beliefs	Revival of the culture, identity and authenticity of the people of the city	**15**
With Yazd's architectural modeling, which is derived from sustainable architecture	Revival of traditional architecture of Iran and Yazd	**16**
By taking advantage of the renewable energy potentials of the city's climate	Reducing the use of non-renewable energy	**17**
Due to sustainable design	Reducing environmental problems and risks	**18**
Modeling sustainable architecture	Reducing complex construction and maintenance costs	**19**
By choosing suitable local materials	Retaining the name of the world city and the brick city of Yazd	**20**
By using sustainable architecture and seeing its benefits	Promoting sustainable architecture	**21**
	Promotion, encouragement and integration of contradictory spaces	**22**

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Investigating the Impact of Video Mapping on Environmental Graphics and Audience Attraction: A Case Study of Successful Executive Video Mapping in Iran

Fatemeh Bakhshi[a], Abolfazl Davodiroknabadi[b]*

[a]*Department of Visual Communication, Faculty of Art and Architecture, Yazd Branch, Islamic Azad University, Yazd, Iran*
[b]*Department of Design and Clothing, Imam Javad University College, Yazd, Iran*

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Research Article

Abstract

The use of advanced technologies of "holography" and "videoamping" in Theater and performing arts directors and designers have been interested in holography and video-amping technologies for the past decade, and it is expected that these technologies will be used more widely in theater and other live arts in the coming years. Theater and technology are complementary in most advanced countries today. While it is clear that theater and technology must be synchronized, a brief comparison shows how behind we are in this area from a global perspective and the contemporary art scene. The present study seeks to examine how video mapping impacts graphics, identify the relationship between video mapping and environmental graphics, examine the role of environmental graphics in attracting viewers, and examine the aesthetics of digital art. Section two is concerned with the research background, and section three examines research methods. Section four discusses the urban principles and regulations and billboards in the environmental advertisement. Eventually, section five is concerned with the summarization and presentation of the conclusion.

Keywords: Video Mapping; Holography; Holofan; Environmental Graphic; Graphics

1. Introduction

Given the technological advancements in the contemporary modern world and its applications across various fields, it has found its purpose in the arts as well. The power of artistic aesthetics and

* Corresponding author. Tel: +98-9131513796
E-mail address: davodi@gmail.com

new technologies as a modern tool should inevitably penetrate design, or else we face the risk of falling behind our time. Meanwhile, technology, creativity, and thought must find harmony alongside each other and in line with the science of the day. The creativity of superior technologies is often reflected in various modern and distinct designs in the form of graphics. Superior or advanced technology has grown into an industrial design style that emerged in 1970, merging industry and advanced elements of technology. The development of post-modern ideas thus coincided with the advancement of technical principles. This era is known to have bridged modernism and post-modernism, noting that technology is always serving the idea. Video arts emerged as a new form of art following the emergence of conceptual arts. Video art consists of moving figures with distinct playback and storage features. However, graphic is not a tool and cannot serve various purposes unless it is dominated by the artist. It is the nature of graphics rather than their appearance that serves a purpose and allows the artist to employ it as a means to an end. When creating a work of art, the graphic artist is bound by his message and his means of expression considering the level of his audience, and these boundaries are considered serious obstacles in recording subjectivity and personal experience.

Providing a peaceful and healthy environment for humans has become increasingly vital nowadays, a portion of which is the task of designers seeking to provide an environment ensuring order, logic, and beauty at all times. Environmental graphics encompasses the parts of our surrounding spaces where various forms, figures, colors, and images are presented in a sophisticated, principled, and planned manner to complement and simplify connections and relationships and complete the beauties of the public space. Moreover, the increasing profess of science has led to the emergence of various lighting techniques with unique and distinct features. Three-dimensional lighting systems were first introduced in 2008 using techniques from the various fields of architecture, lighting, music, and animation. These systems enjoy the advantages of an advertisement on building facades which would ensure income and return of capital. The bond between three-dimensional lighting and environmental graphics are known as video mapping in the advertisements across the city has recently blown new life into urban spaces. Video mapping needs to be further and more closely studied and discussed so its other potentials and capabilities can be realized. Therefore, the present study chiefly seeks to investigate the impact of video mapping on environmental graphics focusing on the case of successful video mappings executed in Iran.

2. Statement of Problem

A notable point is that technology is always serving the idea. Video arts emerged as a new form of art following the emergence of conceptual arts. Video art consists of moving figures with distinct playback and storage features. However, graphic is not a tool and cannot serve various purposes unless it is dominated by the artist. It is the nature of graphics rather than their appearance that serves a purpose and allows the artist to employ it as a means to an end. When creating a work of art, the graphic artist is bound by his message and his means of expression considering the level of his audience, and these boundaries are considered serious obstacles in recording subjectivity and personal experience.

Providing a peaceful and healthy environment for humans has become increasingly vital nowadays, a portion of which is the task of designers seeking to provide an environment ensuring order, logic, and beauty at all times. Environmental graphics encompasses the parts of our surrounding spaces, which is an intersection between science and action where various forms, figures, colors, and images are presented in a sophisticated, principled, and planned manner to complement and simplify connections and relationships and complete the beauties of the public

space. Moreover, the increasing profess of science has led to the emergence of various lighting techniques with unique and distinct features. Three-dimensional lighting systems were first introduced in 2008 using techniques from the various fields of architecture, lighting, music, and animation. These systems enjoy the advantages of an advertisement on building facades which would ensure income and return of capital. The bond between three-dimensional lighting and environmental graphics are known as video mapping in the advertisements across the city has recently blown new life into urban spaces. Video mapping needs to be further and more closely studied and discussed so its other potentials and capabilities can be realized. Therefore, the present study chiefly seeks to investigate the impact of video mapping on environmental graphics focusing on the case of successful video mappings executed in Iran.

3. Research Literature

Denis Gaber (1947) was the first to use holography as a means to improve electronic microscopes by regenerating the waves. The holography process evolved until 1950 when electronic engineers and physicists achieved adequate information on this hypothesis in their laboratories. In 1958, Yuri Denisak –a researcher graduate of the Russian Institute of Visual Education- developed wave photography. Amit Leith started his work on fake camera aperture radars in 1953. In 1960, he and his colleague Jerry Apanti started working on a project to enhance the quality of photo waves captured with weak lenses. Their insight into electronic engineering and communication theory was integrated with new lasers to develop high-quality images from 1962 onwards. Their research on building realistic 3D images was concluded by the end of 1963.

In his study entitled "Holographic images and their application in communication science," Mahdinezhad (2010) carried out secondary research to draw a scientific portrait of holographic images (Mahdinejad, 2010). One of the most prominent advantages of holography is that holographic images maintain the properties of the original object and can thus be used to study any desired object without the need to have access to the original object. Moreover, holographic images can make any object more familiar and tangible since they can be created for any real or imaginary object. This is an extremely influential feature in communication science, particularly when it comes to visual communication and the transmission of messages and symbols.

In his book entitled “Environmental graphic arts,” Ostovar (2014) performed a detailed investigation and study of the definition, history, actors, dimensions, application, and tools of environmental graphics (Ostovar, 2014). In another study entitled "An investigation of the features of video art in Iran and across the world," Mohagheghzadeh (2014) investigated the features of this art across the globe and briefly mentioned the characteristics of video art in the USA, Asia, Europe, and Iran (Mohagheqzadeh, 2014). Modarresi (2015) carried out a study entitled "A study of advertisement boards in environmental graphics" concerned with a detailed examination of advertisement, advertisement regulation, environmental graphics, and advertisement pathology in Iran (VameghModarresi, 2015). Turning to studies on features of holographic images, no study in the form of a dissertation has been performed in the country to the best of our knowledge. The available references on holographic images are concerned with how the images are created and their physical features, whereas their visual and practical features in various branches of the communication science require a detailed study of the holographic images examining their unique features to present a visual element based on an understanding on the design, production, print, and display of holographic images.

4. Terminology

4.1. Video Mapping

Video mapping also known as projection mapping or 3D mapping- refers to the techniques of projecting images on objects to create an illusion and trick the audience into thinking that the displayed images are real. This measure may be taken using one or several video projectors (www.behprice.com, 2018).

4.2. Environmental Graphic

This term refers to the visual or graphic perspective of the environment, which is the definition of the phrase "Environmental graphic and graphical environment." Of course, the term "urban design" is also quite close to the environmental graphic in terms of concept so the two terms are sometimes used interchangeably to refer to the same concept (Iloukhani, 2009).

In the process of the creative cognitive act, the individual first becomes aware of some tangible differences and starts to perceive and recall a set of similarities associated with these differences, similarities that cannot be perceived based on the available knowledge and information. Creative work is dependent on a creative mindset more than anything. There is only so much in this world that can be attained through specific techniques and formulas. The clear truth is that creativity and innovation are not among them. Creativity in the environmental graphic is among the influential factors impacting this field of art. Creativity can be defined as the ability to come up with a novel solution to problems or various situations within humane limits and is among the essential capabilities of the human mind that can help develop facilities, solve problems, and rethink one's ideas (Varamini, 2008).

In the 1960s, an electronic engineer named Billy Clover ran the “Afternoon collection: Theatre and Engineering” in the Ninth Regiment Armory in New York. This how led to the establishment of the Experiences in Arts and Technology (EAT) organization managed by Rauschenberg and his engineer colleague, Clover.

However, when recalling this starting point, one would have to keep in mind that those who were present in the shoe remember it not as a technical success, but as a program filled with defects. Moreover, what Rauschenberg and Clover experimented with –such as tennis rackets equipped with radio transmitters- does not appear to have defined the main current of contemporary technological art (Smith, 2003).

4.3. Environmental Advertisement

This is a type of advertisement presented in outdoor environments. Environmental advertisement is among the oldest advertisement methods in which the audience inevitably notices the advertisement since they would have to see it among beautifies of the environment (Arabzadeh, 2016).

The environmental advertisement offers tools capable of passing through the advertisement pass and reaching the target audience, especially in cases where users are on the move and are thus quite receptive to advertising stimulants (Mohammadian and Pourhosseini, 2012).

The history and development of cities suggest that store and business owners have long used advertisement boards –even if quite simple at first- t attract customers, and the boards and panels have become more modern and visually pleasant with the development of the settlements.

Therefore, one could suggest that all cities are similar in terms of advertising signs from various guilds, but vary in terms of the forms and spaces of urban advertising (Gilij, 2013).

4.4. Holography

Holography is among the methods used to create 3D images using lasers, which means that holographic images can be created using the properties of light (Mahdinejad, 2010).

The history of this technological art dates way back. One of the first 3D projections or video mappings recorded in history dates back to 1969 in the opening of the "Haunted House" in Disneyland where busts used to sing. In this video mapping, the heads of the singers were first recorded on 16mm films separately and were then projected on the heads of the busts to create the illusion that the sculptures were signing. From 2004 onward, intelligent video projectors were introduced to the market, resulting in substantial developments in video mapping.

Projection mapping has currently become simpler than ever due to the introduction of various software and video projectors with special video-mapping capabilities. However, the taste of the audience has also become more sophisticated, resulting in a demand for complex and creative video mappings that only specialists in this field can pull off (Biyabani & RoghaniGolpayigani, 2021).

5. Research Methodology

The type of research should first be determined so that the research method can be clarified. Overall, the research methods in behavioral sciences can be classified based on two criteria of research goals and data collection tools. Research is classified into two categories basic and applied research (HafezNia, 2016).

A portion of the present study is carried out through desk research to develop the research background, which will be performed through the review of credible scientific articles, books, websites, dissertations, etc.

The present study also employs field research since it examines various components of environmental graphics ranging from its technical and scientific process to artistic presentation and printed results, which entail the present study going through the inductive research process. Image contents have been investigated from the recording to presentation and each branch has been elaborated on by presenting the application of the images.

Therefore, the present work falls into the category of field research. Secondary references have been used to present a scientific definition of environmental graphics and video mapping. Moreover, analytical methods have also been adopted in the present study to paint a descriptive-analytical picture of the results.

3D mapping is a vessel of a presentation delivered on shapes, which can be performed using several video projectors as well to create motion pictures, animations, textures, and colors in various adverts and even in fashion shows and celebrations to attract an audience and create realistic illusions. The graphic is among the most influential factors in the community whose primary applications include advertisement, message transmission, and audience attraction. The environmental graphic is among the branches of graphics that plays a significant part in message transmission purposes.

Today, techniques such as video art, Holofan, and video mapping can be used to cover all needs in the advertisement, message transmission, promotion of socio-cultural and political knowledge, etc., and establish logical formal relationships and precise organization based on visual principles.

Video mapping (3D lighting) or video projection is a technique through which unconventional surfaces and masses can be turned into video presentation surfaces by projecting 3D images and designs on them, which makes it possible to present distinct visual images on surfaces with a combination of light, sound, film, and animation.

6. Results

6.1. How Video Mapping Work

Video mapping is the result of projector light hitting uneven surfaces such as building facades, models, or products. This specific lighting technique is implemented by projecting a video or image on an object based on its angle and physical complexities (presentation board).

Execution: To develop and execute 3D mapping, the desired surface should first be selected and studied. 3D content or design, media, video duration, color, music, etc. are then decided. The fifth chapter discusses Holofan, a 3D lighting technique, and its impact on society and audience attraction.

6.2. Holofan (A Novel Approach to Environmental Advertisement)

Holofan: Holofan is capable of playing various types of videos in 3D and suspended in the air. An array of 724 LEDs is installed on the blades of a fan creating unique images at the moment by controlling the color of the LEDs. Holofan is a new technology from the 3D Displays family and is among the holographic devices such as Magic Box (holography box) and Stage Magic (holography stage), with the only structural distinction that both electronic and mechanic engineering and 3D imaging have been used in holofan. Holofan is extremely visually appealing but has its specific limitations and quality.

Holofan can display various types of videos in 3D and suspended in the air which is extremely appealing and attractive. Larger animations and images can be displayed by putting several holofans together. This technology can be a new generation of environmental advertisement and has undertaken significant growth across the world over the past few years.

This device is an essential component of environmental advertisement in society. Holofan has been produced in China and England and is used by large companies such as Benz and Audi in their advertisement. Holofan can form direct bonds with various social classes, create the illusion of real images to attract an audience, and make the audience feel like they have teleported to another space. Holofan is a new art with a novel approach to an environmental advertisement that can replace old advertisement techniques and usher in a new age of novel arts.

Table 1 Complementary explanation of the software used in video mapping (author)

DIGITAL PAINTING	Digital painting
PHOTOSHOP INDESIGN MISCHIEF SKETCHBOOK KRITA GIMP 3D MAX BLENDER MAYA CINEMA4D	Software used by designers to design illustrations, perform imaging and simulation and create animations, fashion art, and modeling and 3D editing software used in industrial design, movies, and motion graphics used to edit real images and create 3D games or edit movies.

LUMION CELACTION2D TOON BOOM HARMONY MOHO (ANIME STUDIO) DIGITAL FASHION ILLUSTRATION LIGHTROOM PREMIERE MARVELOUS DESIGNER GEMINI GERBER LECTRA OPTITEX CAD PATTERN DESIGN PATTERNMAKER MARKER STUDIO DC SUITE COREL DRAW FASHION SOFT DÉCOR CAD PRO SLID WORKS SKETCH UP PRO 100 3D SKETCH LIST	New researchers can use them in new designs and display multiple works together. Software used in interior design, furniture and decoration design, material display, lighting, and simulated images
STEREOLITHOGRAPHY is based on a light-sensitive monomer resin used in Precipitator modeling, digital light processing, and 3D printers used in dentist offices.	
RHINO REVIT	This two software are used in industrial, structural, and architectural design on modeling, production, and graphic multimedia

6.3. Response to the Research Questions

Question 1: How has video mapping art influenced environmental graphics?

Answer: The bond between art and technology is a mixture of light ad images presenting unconventional masses and surfaces as 3D illustrations.

Question 2: How does 3D art relate to the real world, and how does the audience react to it?

Answer: 3D art creates a three-dimensional and interactive demonstration of the real world for the audience, which is a combination of illusion and reality.

Question 3: How can environmental graphics be used in an advertisement?

Answer: Environmental graphics can be used to simplify, connect, transmit messages, perceived the environment, and promote visual identity in the advertisement.

Question 4: Which branches and forms of advertisement are more successful?

Answer: The art of holofan with 3D technology can most effectively attract the audience through environmental advertisement and establish a more attractive and better connection to the audience through 3D images.

7. Recommendation

This software can be used to create attractive and unique designs resulting in spectacular works of art, and researchers can employ them as individuals or together to develop new techniques. Moreover, researchers can take advantage of these software to create graphic works, holofan, and video mapping and leave impactful works behind.

As mentioned in the previous chapter, various factors such as conflict, proportion, balance, light, color, texture, resizing, unity, diversity, continuity, repetition, and escalation are involved in environmental graphics. Future researchers can take advantage of the new holofan art technology alongside diverse colors, textures, lights, music, and videos to present new and innovative works.

8. Conclusion

As mentioned earlier, holofan is a new environmental graphic technology that could usher in new approaches to the environmental advertisement. This technology can also play a prominent part in society when it comes to advertisement and connecting with people from various social classes. The impact of fast transmission, beauty, and creativity in art alongside music can give the audience a new sense of environmental advertisement in the contemporary era. New technologies of the new age make it possible to establish a better connection and create a more pleasant space to express emotions, transmit messages, and attract audiences.

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Studying the Role of Mask in Art and Culture

Hoda Ahmadi[a]*

[a]*Department of Art, Najafabad Branch, Islamic Azad University, Najafabad, Iran*

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Research Article

Abstract

Mask is one of the objects that date back to ancient times. Masks can have a magical or religious function. They may appear in "Tasharof" ritual or as makeup in a theatrical form or used to change a person's appearance in a ritual ceremony. The use of masks as a cover is seen in the native and old cultures of different countries. Considering the diversity and spread of masks all over the world, masks can be considered a cultural message that is mixed with local and regional art. In this article, it is concluded that mask in Iran represents the aspects of display and display, and in art, it represents an artistic tool by which the artist dissolves into another character.

Keywords: Mask; Art; Culture; Ritual

1. Introduction

Considering the variety and extent of masks all over the world, they can be considered a cultural message that is mixed with local and regional art. The small differences that we see in their details in neighboring regions show the cultural exchange of these regions, which has existed since ancient times between nations and tribes for various reasons such as war, trade, friendship, migration, etc. has taken place. In many cultures, masking is considered a part of ritual. Sometimes the mask gives superhuman strength to the person who wears it on his face, and according to his beliefs, he can communicate with his past. Changing the face by performing masks that originates from ritual masks can also be for the purpose of creating communication and increasing psychological power for political purposes and entertainment and happiness. But since these differences or changes have been made with the passage of many years of their history and have been adapted and harmonized with the art and religion of each region with great elegance, they have appeared as invisible

* Corresponding author. Tel: +98-9137379024.
E-mail address: ahmadi7hoda@gmail.com

changes. These changes can be seen not only in their appearance, but also in the functions and the way of performing the rituals associated with the mask. In the same way that the protruding eyes of a mask with the purpose of entertainment and laughter among a people, turns into a mask with hollow eyes of another ivory mask with the purpose of warding off evil in a neighboring area. Whatever the appearance of masks may be, it is obvious that masks are a valuable craft of the artists of each region, which are prepared with precision and a specific purpose. Mask is a cultural tool whose meaning has been forgotten and dates back to ancient times. One of the very important and unique points about it is that the emergence and making of the mask has also existed outside the scope of ancient civilizations, and probably in primitive cultures such as the culture of African tribes, it has had an interesting acceptance and evolution that even It has influenced the works of modernist artists such as Picasso.

Fig 1 African mask used in Picasso's painting

Over time, the word "mask" was applied to a person or a character who played a role in old plays with a mask on his face. At the beginning, this act was used during the religious rituals of the people of the past, and then it found a special place in Greek and Indian dramas, so that the masked person acted as if he was the goddess of life and death (Najafi Ayuki, 2011: 117).

Fig 2 Bronze mask discovered from Lorestan in Florida, USA

In our culture, masking and wearing a disguise means a kind of covering, changing the appearance, and maybe even deception, trickery, or pretense. In the sense that the mask wearer intends to change his position and play another role, wearing a disguise is a kind of personality change. This is while other cultures, for example the African culture of wearing a veil, do not have such meanings and the emphasis is on what is created rather than on what is covered. In Central Africa, "Makshy" is a common name for a group of masks and a show in which masking is part of its rules. In fact, Makshy ranges from funny shows to circumcision and the ceremony of resurrecting the dead soul. It works. In this last case, Makshy means the first spirit, and during this ceremony, they try to bring such spirits to the world of the living to fulfill the wishes of the living. Other meanings that are taken from Makshy refer to the spell, prayer, incantation and magical tools. In general, it can be said that verbal Makshy is considered a key to name a group of living forces, but in our culture, the word mask refers to non-living things (Yung, 1991: 154).

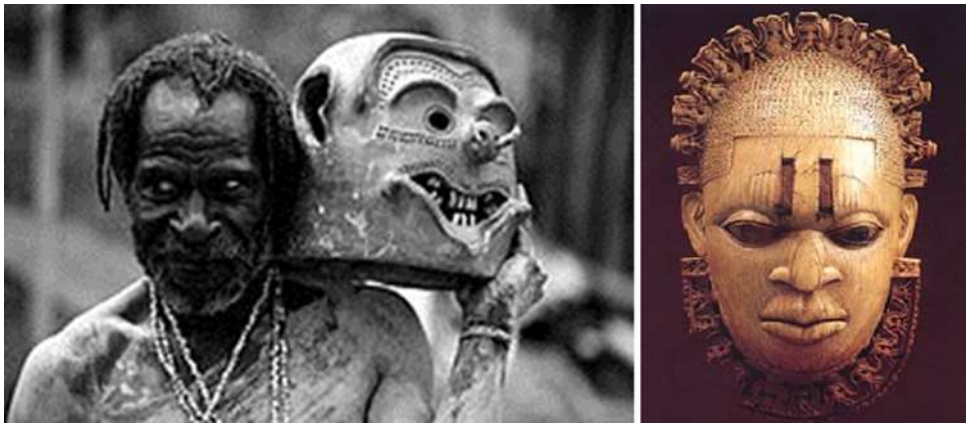

Fig 3 Ritual mask and African wooden mask

The variety and number of masks is a sign of the variety of their functions. Some masks are used for entertainment and creating enthusiasm among people and have a kind and friendly appearance, some are made for religious rituals and ceremonies and may have a scary appearance, some others are for honored guests and rituals are prepared, and those who convert to a particular society wear special masks and go through difficult and exhausting stages, changing their dignity and social status from childhood or adolescence to youth, from ordinary people to warrior people, and etc.

Contrary to popular opinion, the mask is not a false face, but a tool that creates a new identity with new traits and characteristics and makes this identity believable. Therefore, it can be considered a tool of transformation. Using a mask allows the wearer to appear in a situation that may not be possible for him in reality, so the appearance of this new character is possible with the magic of the mask (Bedouin, 2003a; 28). In many cultures, wearing a mask is a part of a ritual. For example, we can mention the healing dances of the primitive peoples of Oceania, which are performed with special masks (Figure 4). In such ceremonies, the mask acts as an intermediary between the higher powers (healing gods) and their main selves, and is even considered sacred, although sometimes this form of mask gives way to makeup in such ceremonies (Bedouin, 2003d: 36).

Fig 4 A boy dancing with a mask

2. Discussion

According to the topics mentioned, masks can be divided into different categories:

2.1. Mask of the Dead

The very common custom of burying the dead with a masked face, of course, is closely related to the cult of the dead, which, according to different cultures, either complements embalming techniques or replaces mummy. This is done in such a way that after preparation, they only cover the skull with it, or the whole head is separated from the body and preserved with a mask, so that in case the body rots, it is a protection for his soul and spirit. In the city of Jericho, Jordan, a number of prehistoric figures of a man's head with a piercing appearance belonging to the 7th and 8th millennium BC have been found. The faces of these real skulls are reconstructed with plaster and a piece of shell is installed in the place of the eyes. In fact, these were the founders of the face-making tradition (Figure 5) (Johnson, 1913: 16). The mask of death reveals one of the basic functions of the mask. "Louis Bedouin", one of the researchers in this chapter, says that it clarifies the role of the intermediary between the two conflicting worlds of life and death, the visible and the invisible. But, of course, it can play this role because it is basically a means to realize metamorphosis (Bedouin, 2003b: 34).

Fig 5 Plaster skull from the Neolithic age belonging to the old city of Jericho in Jordan

2.2. Mask of the Figures

Statues of gods in ancient Egypt and Mexico before the time of "Columbus", and probably the land of "Gaule" were sometimes masked. It is assumed that a mask with the shape of a jackal's head, which is kept in the Museum of Lore, belongs to one of the figures of a famous speaker. Sahagun writes in his book that in the month of "Izcalli", they made a doll of the fire god (Xiuhteucli), and on his face was an embroidered mask. They were tied with pieces of turquoise stone and rows of green stones called "Chalchuihuitl", which was very beautiful and bright. It is thought that the masks made with bronze sheets, which were obtained in the archaeological excavations of the Land of Flowers, may have belonged to the statues or dolls of the gods (Yung, 1993: 57). (Figure 6 middle).

Fig 6 Nigerian mask (left), African wooden mask (middle), Talisman mask (right)

2.3. Small and Spells Mask

The spread and dispersion of these objects, geographically and culturally, is not subject to a well-thought-out order. However, two types of masks can be distinguished: first, small masks used by dancers with special magical or decorative use, and second, the finger masks of the Alaskan Eskimos, which is an extraordinary mask. The small masks of "Don" (Ivory Coast) have a kind of handle that the dancer holds with his hand while dancing. In finger masks, this mask was installed on two rings that Eskimo women wear on their fingers. The artists of the former kingdom of Benin (Nigeria) used such masks a lot (Yung, 1997: 63) (Figure 6 left and right).

Carl Gustav Yung, one of Freud's students, classifies the mask into two categories; The first category is a mask that a person puts on his face and shows himself as he is not. The second category includes unreal ideas and fantasies that prevent the growth and development of his true self. Yung believes that the personality in their lives, they are under the domination of the archetype of the mask, like the actors in the plays. That is, the actors of the plays play the roles by wearing a mask on the stage of the play (Yung, 2000: 270).

3. Protective Masks

These masks are responsible for protecting the identity or health of the person. This protection and protection from the mask is not necessarily material but can be spiritual depending on their magical power. (Bedouin, 2003: c; 41) The mask of thieves to change their face or the mask used by warlords to disguise their identity against the enemy are also of this type.

4. Ritual Masks

Ritual masks are, by definition, made due to ritual needs and necessities. They have often been mediators between gods and humans. By performing magic and creating works that we call works of art today, early man tried to seek help from the gods to achieve success in hunting or war. Also, warding off demons and gaining the satisfaction of good spirits is one of his other goals in making ritual masks, which we see continuing today in the icons of spell books. In fact, the mask that man wore on his face in ancient times was a medium between supernatural gods and his audience (people or his enemies). In fact, in ancient times, we are faced with the issue that political positions had religious powers. Egyptian gods were actually masked people who tried to embody those gods with masks. For example, "Sobek" was a god with a crocodile head in ancient Egypt who ate the hearts of dead people who did not meet the desired weight (Hall, 2001: 41).

Fig 7 Ritual mask of Switzerland (left), Ritual mask of Bulgaria (middle), Ritual mask of Amazonian people (right)

5. Demonstration Masks

The origin and principle of ancient Greek theater can be found in the ceremony held in praise of Dionysus, the god of joy, movement and fertility. This ceremony was performed with music, singing, dancing, colorful clothes, various masks with the role of goats, devils, etc. The celebration was held in March and lasted for six days. During this time, all the people of Athens were happy and dancing. The cleric who played the role of Dionysus puts a smiley on his face. Since, six centuries BC, the face has had a high place in the ancient Greek theater. "Thspis" is known as the founder of the tragedy show and the innovator of face painting. At first, he decorated simple masks with white water, later he used more subtlety in this work and used plant color to paint on the face, then he made linen masks on which he drew lines with grape sediments. After "Thspis", "Phrynichus" made different masks for men and women. During this period, the actors were all men and the show was performed in a large space where the distance between the audience and the actors was very far. In female roles, white linen masks were used, and in male roles, a darker mask was used (Mihan, 2010: 5).

6. Mask in Human Cultures

Covering the face with a mask as a tradition, ritual or social behavior has long existed for humans. In order to respond to material and spiritual needs and to deal with the hardships and problems of his primitive life, primitive man had to adapt and influence his surroundings. Such a need was ultimately to turn to behaviors and rituals that could connect him with unseen forces and powers and belief in magic, healing spirits, saviors, powerful and holy ancestors, gods of goodness and benevolence, and gods of evil. In the meantime, putting a mask on the face or covering the head and body with a different cover in some of these rituals was considered a powerful tool in the hands of magicians and magic doctors and tribal chiefs. By using these masks, they became a mysterious and powerful person who was able to answer questions. This power and transformation has remained as a secret until today (Razi, 1992: 30).

The remains of carvings and stone inscriptions, mostly inside the caves, show the prehistoric use of the mask with more religious functions. The history of using the mask as a cultural-religious ritual dates back to the 8th century BC, which was considered a part of religious ceremonies and functions at that time. But there are also signs that indicate that the use of the mask is older and more rooted among primitive peoples. For example, we can refer to the carvings discovered in the "Trois-Fros" cave in the highlands of southern France, where a carved image belonging to the previous ice age was discovered. According to "Aleksandra Marshak", this image belongs to "witchcraft" (Figure 8), a mask with an owl-like face with animal ears and round eyes, wearing a skin similar to animal skin. The Indians carved their masks on a living tree, then cut it from the tree and put it on while it was still alive (Bates, 1996: 101).

Fig 8 Witchcraft mask

In the mysterious and ancient ritual of "Mitra", it has been common to use special masks in celebrations and different stages of people's lives. This kind of imitating their screams and shouts, imitating their jumps along with showing their movements and dances are actually surviving and symbolic shows of primitive customs whose effects have remained in the form of shows in carnivals and celebrations until now (Razi, 1992: 21).

In ancient Greece, the word "mask" was a derivative of concepts such as individual, human, essence, person and identity. In general terms, a mask is a preparation for covering all or part of a

person's face, his nature and his inner being that reveals it. Therefore, the mask can be an opportunity to hide one's identity for a moment and play a role that the appearance of the mask allows. The mask has the power of concealment and has the ability to change or distort the character hidden behind it. Wearing a mask allows a person to play the role of a legendary, ancient or invincible hero, even for a short period of time. The mask of death has always existed in the tombs of Egyptian mummies. This device allowed the spirit of the deceased to recognize and find his body when returning to his grave in the evening. Aztecs, Mayans, tribes from Central America, Incas and other Andean civilizations also used masks in their rituals. Indians, Japanese, and Chinese, along with Greek and Roman artists, used masks in theater and stage performances.

The Roman Church also did not underestimate the power of the mask, and by using it in religious ceremonies, it tried to make spiritual use of this device. However, the real life of mask among the common people flourished with the establishment of carnivals and seasonal festivals. With the emergence of "Del arte" (comedy theater) during the Renaissance, mask had the opportunity to once again appear in local and popular traditions (Ruh al-Amini, 1997: 61) (Figure 9).

Fig 9 The mask used in Del arte's comedy

7. Mask in Performing Rituals of Iran

Cultural rituals are woven in the depth of human life and have formed a part of his beliefs, convictions and outlook. Most of these social rites and customs have been created under the direct influence and through a set of different social, political, cultural, religious and historical factors, and many factors have played a role in their formation, survival and development. Among cultural rituals, there are traditional performances that are closely related to rituals and create ritual performances. These ritual performances contain a treasure of rituals, language, behaviors, moral standards, tastes, thoughts and religious beliefs. The mask was created to embody another being. The ability to show different characters and concepts along with social and historical conditions has created different functions for mask. In the position of fertility idols and charms, the mask finds a ritual effect that has a dramatic aspect in the show and theater and is powerful in terms of psychological messaging. Masks are effective in manifesting the creative power of the mind and harmonizing mental ideas with physical performance. A simple mask in the show as a raw material is able to actualize the creative power of its actor. Performance traditions and rituals always have powerful performance aspects and have common and sometimes unique characteristics in every culture. These traditions and customs are sometimes rooted in deep beliefs and thoughts, and sometimes they are in interaction and conflict with other ethnic beliefs and have entered the customs and traditions of the target nation over the centuries. Performance traditions have a close

connection with rituals and are among the most dynamic and powerful elements of various cultures. Ritual performances contain a treasure of rituals, language, behaviors, moral standards, tastes, thoughts, jokes and religious beliefs. Therefore, they are rooted in people's beliefs and beliefs.

8. Conclusion

In different lands and cultures and in more or less distant eras, the ritual role of the veil has not always had the same importance and meaning. Mask, which has been absolutely necessary for the religious life of some ethnic groups, on the contrary, in the religious life of other ethnic groups, it is considered as a secondary necessity of rituals and ceremonies. With the exception of theater and carnival masks, it can be said that all masks are fused with cultural life. Ritual masks have been mediators between Gods and humans and messengers of Gods, including the mask of spells and magic, and the mask of death, which was one of the basic uses of masks in the past. This device allowed the soul of the deceased to recognize and find his body when returning to his grave. Mask has long been associated with the most sensitive thoughts and beliefs of mankind, and their wide impact on the psyche of the audience is another aspect of this. How a mask psychologically causes a person to acquire a habit of behavior or a phenomenon of change of procedure and attitude is an indication of the updating of its ritual function. Mask is an opportunity to hide one's identity. The mask allows a person to play the role of a legendary, ancient or invincible hero, even for a short time. Some Masks are meant for fun and rhythmic movements, but it seems that the communication between supernatural forces sometimes takes place through fun and entertainment and brings everyday life into religious ceremonies.

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