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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 Aug – Sept 2020.

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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Expressing Effective Criteria on the Physical Identity of the Urban Street Walls (Case Study: Hafez Street, Shiraz)

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Abstract

Urban bodies are effective elements that affect the quality of urban spaces, its improvement causes better quality of the city. Streetscape is another main components of urban buildings having impact on visual and physical quality of the building and urban spaces. Resulting in effective decision making by planners. The building's façade, urban walls overlooking the streets and squares are considered as influencing environmental element to improve the physical quality and aesthetic of the urban spaces. The present study, investigate the urban walls and its role in the quality of physical identity of façade. The effective element for the Hafez Street of Shiraz was investigated for the physical identity of the street walls. It was found that how the obtained results can be used in future research to organize and optimize the street facades. The research implies analytical-applied method, data was collected through questionnaire. The Morgan table has been used to specify the number of questionnaires. The reliability and validity of the questionnaire was confirmed by Cronbach's alpha coefficient. The data analyses were done using Pearson correlation coefficient and SPSS.

The findings showed that indicators ground connecting line, complexity and contrast, positive and negative surfaces, diversity of structure, human scale and skyline according to visitors, have maximum impact on physical identity of the street walls. The experts viewpoints indicators, diversity of structure, complexity and contrast, ground connecting line, human scale, positive and

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This article is derived from the first author, Ali Ghahramanpour Ph.D. thesis entitled "Organizing the Urban Façade of Shiraz City with an Approach to create Identity and Attract the Attention of Audiences", under the supervision of Dr. Hadi Keshmiri and advisor Dr. Bagher Karimi at Islamic Azad University, Bushehr Branch.

negative surfaces, and rhythm and harmony have maximum impact on physical identity of the Hafez street walls.
Keywords: Urban Street Wall; City Body; Physical Identity; Hafez Street of Shiraz

1. Introduction

Recently, the urban spaces are wrapped with bodies that ignore the visual elevation values. This challenge has reduced the attraction of activities. The pedestrian space acts as a two dimensional track for traffic to pass. This visual turmoil along with other pollutant has distorted the urban space, and urban aesthetic faces difficulties (Davarinejad Moghadam and Rahimian Moghaddam, 2017: 2). The structure of ancient cities has the tendency and strength of living with lasting phenomenon. The city inhabitant need these lasting spaces so as to belong to them and to percept the meaning of inhabitants from past to present.

Kevin Lynch defines persistence as the resistance level of element of a city against the deterioration and destruction and the ability to operate over a long period of time (Pakzad, 2006: 113). The human living in environment has an influence on human behavior and identity towards its own values (Aminzadeh and Naghizadeh, 2002: 31). The city can be seen as an environment for expressing identity, values derived from beliefs, world perspective, and culture of the inhabitant. This concept has undergone changes overtime in different countries with different natural and human environment and influenced by historical and ideological changes (Mirmohammadi, 1996: 181; Habibi, 2005; Koneo, 2005; Falahat, 2011; quoted from Abu-Lughod, 1987).

The city has been influenced by factors such as physical, social, economy, and cultural issues and has shaped its identity in proportion to the factors. One of the most important physical element which has direct correlation with the citizens in the urban landscape. The building facades located in the urban texture other than giving interior space the form to the building, also encloses another space which is called as urban space. In fact, the external surfaces of the building provides lighting and landscape for that building and at the same time forms space that are streets, alley and square and in all called as urban spaces and proportional to these spaces it is the interior surface. These spaces belong to public and community, and the users of these spaces are more than the interior spaces. One of the most important element of physical urban effective in relation to the citizens and strengthen the sense of place in the urban space is the composition of building facades and in other words the city elevations. The façade of the building in composition with other buildings and in the space called as streets was evaluated. Therefore, the urban landscape is not formed by a single architect at a specific time but, it is formed over time by numerous builders (Crohna, 2011:45).

The factors that miss-identifies in the urban landscape are the taste implementation, un-professional involvement in the work, dominance of building and sell, implementing the owner or employer's taste in the design and executing the elevation, the lack of architect's involvement in the design, poor construction material, lack of proper control and ignoring the principles of traditional Iranian architecture. To construct a beautiful environment, one must create areas for issues such as comfort, diversity, identity and environment legibility (Mousavi Sarvineh Baghi and Sadeghi, 2016: 100). Unfortunately, because of rapid construction in the recent years has paid less attention to these components. The reason is that today's city landscape has taken the shape regardless to physical city, principle of architecture and urban aesthetic. Therefore, a review is needed in order to regain the effective fundamental principles on the design of walls of public spaces.

In this study, initially the urban walls and its role in the quality of physical identity in urban facades were investigated. Then by studying the Hafez Street in Shiraz, the effective elements in the

physical identity of the walls of this street was investigated. So, that in future research one uses the result to organize and optimize the walls and facades of this street.

The purpose of this study is to create a conceptual and appropriate framework for assessing the criteria and indicators of the physical identity in urban walls. The question raised, can be expressed that which criteria and indicators are effective in creating the physical identity of street walls? To what extent the walls of the street are effective in the physical identity of that street?

With the above mentioned issues it is assumed that the existing indicators of the physical identity on walls of the street is the fundamental physical identity of street and using physical identity dimensions can manage and design the quality of street and its wall and can benefit in urban planning management and urban design.

2. Literature Review

Camillositha in the book entitled, 'Art of building cities' has stated its restoration views in terms of spatial or place hierarchy, integration and adaptation, historical identity, balance through the organization of urban spaces for not going at high speed in ancient texture and giving priority to pedestrian (Habibi, 2001: 49). Christopher Alexander has considered three aims of intermediacy in the ancient texture as organizing, changing and the action plan is the rebuilding, renovation and improvement. The proposed user is the contemporary building and the intermediacy method is the comprehensive urban restoration (Habibi and Maghsudi, 2002: 50).

Identity expresses the characteristic of each individual or phenomenon (Bamanian et al., 2010: 40). Identity is the result of everyday cognitive emotions and extensive social communication that needs place for formation (Pourjafar and Hashemi Damneh, 2011: 12). This case causes the creation of similarity in individual and nation, which leads to distinction between individuals and groups (Akbari, 2008: 220). Each framework has a physical order, visual order, physical comfort and balance (Bahreini and Tajbakhsh, 2001: 20). Therefore, physical identity means characteristics that distinguishes the body of city from strangers and reveals its similarity to itself. The following criteria are considered for its evaluation 1) Distinction/Similarity, 2) Continuity/Transformation, 3) Unity/Plurality (Mirmaghtadaei, 2004: 37). In some cases, urban walls are considered as structural phenomenon resulting from environmental impacts (climate, economy). In assessing the expectation from urban façade, four factors such as protection, communication with urban space (to offer light, visibility, access and ventilation), property owner, and ultimately being as part of the whole were considered (Pakzad et al., 2003: 32). According to Gordon Cullen (1961), urban landscape is the art to integrate the structural and visibility of the building, street and places that built the urban environment (Cullen, 2003: 78). In view of John Raskin, urban landscape is planning and urban design and primarily it is values, human goals, and the recognition of social responsibilities by majority of the community (Golkar, 2003). The urban landscape is the result of contact between people and the city, and in this regard, man activities has an influence on the urban landscape and behavior and cognitive perception of the citizens is through contact with urban landscape (Crow, Brown and Young, 2006: 282).

According to Golkar (2003), the urban aspect is a triple combination from the visual landscape of the city, cognitive aspect and emotional aspect of the city which is based on behavior (Golkar, 2003). Gordon Collen (2003), considers urban landscape as the art of proportion. Collen's statement for the term urban landscape is based on physical city with the emphasis on observation in the city. In his book, highlights the importance of consistent observation of the environment. He states urban landscape that when a building is built on a site it is considered as the architectural experience, but if many buildings are built together as new event occur is considered as urban

landscape. This new event is called as art of proportion (Collen, 2003). Lynch (1961), in his book entitled, 'City's cognitive image', has presented the concept of city cognitive image. He has proposed the urban landscape cognitive dimension. Therefore, if Collen had emphasized on objective dimension, Lynch has considered cognitive dimension (Lynch, 1994: 189). Lynch considers perception, physical and functional as three factors in urban landscape (Rezazadeh, 2006: 23). Lynch for the study of mental image of city considers each urban environment as three elements which are identity, structure and meaning (Table 1).

Table 1 Key concept by experts in the area of physical identity and the design of urban walls

Researcher	**Year**	**Key concept (urban walls)**
Kevin Lynch	1960	Perception, physical, functional
Mansouri Karimi	2008	Aesthetic, functional, identity
Moshaver	2010	
Abdollah Khan Gorji	2006	Visual, physical, spatial, activity, identity, environment
Tavassolli	2000	Order, unity, composition, harmony, symmetry, balance, rhythm, centrality, window divisions, visual stability, volume, building mass, street space enclosure, vertical rhythms, horizontal rhythms, skyline, shape continuity, attention to the corners, attention to composition of elements and façade, coordination of colors and materials of buildings, identification of valuable facades
Pakzad	2003	Façade width, transparent and opaque surfaces, empty surface, elevation line, console or projection, posters, lighting, plants, corner building and ground line, combination of two elevation, dominant background color, material and texture of the elevation, proportion of ventilation, maintaining basic pattern, body and sky in designing elevation so that it can be understood from near and far away.
Atashin	2012	Wall proportion, floor, color, skyline proportion, sequential vision, rhythm, harmony, architectural style, projection and depression.

(Source: Author, 2018)

3. Conceptual Framework of the Research

3.1. Concept of Physical Identity

Physical identity means the characteristic that distinguishes the body of the city from strangers and reveals its similarity to itself. This characteristic should be in a way that the body of city along with the preserving the continuity of time must evolve, and finally lead to the emergence of a whole. The conceptual view of physical identity is synonym with the term personality and sense of place.

The criteria for assessing the physical identity are (Table 2):

1. Distinction / Similarity mean the distinction from stranger and similarity with itself.
2. Continuity / Transformation mean connection with the past and non-discontinuity.
3. Unity / Plurality: means the connection between different and heterogeneous components in a way that create a whole (Godarzi Soroush, 2013: 103).

Theories on connectivity and regionalism are the basis to interpret and describe the above criteria in the area of architecture and urban design. Identity is the norms and values categories that discusses about its needs, valuation and normative deployment. In many specialized and research documents, the study of identity in the artificial environment has been carried out with respect to perception theories of environment and behavioral sciences. In these studies, identity means sense

of belonging and to assess the identity criteria like sense of security, memorable, sense of belonging and dependency has been implemented (Daneshpour, 2000: 25). In Fig 1, it indicates number of physical identity components in the urban walls.

The fundamental components of urban walls although been connected and not separable, but with respect to the study criteria are studied separately. From Carmona viewpoint the physical urban landscape is divided into three types of walls, roofs and earth which are described as;

Rooftop view: Rooftop according to the viewers views consist set of elements that lies between the skyline and horizon line. The skyline is the baseline separating the physical wall with the sky. The horizon line is the upper boundary of the vertical wall.

Urban wall view: Among the physical elements, the urban walls play an important role in defining the city's landscape. The quality of perception of a classical urban space in the very first step is the origin of the discipline resulting from the ratio of dimension and the size of the two elements of the space. The perception of spaces is carried out in various proportions of walls and floors dimension and in different areas (Carmona, 2003: 149-158).

Earth view: The earth view represent the base landscape of urban space and collection of natural and artificial elements surrounded. Aldo Rossi (Italian architect) states that the elements which forms the city's physical landscape are divided into two categories; a) the manmade element that can be separated to two types as static and variable elements; b) natural elements: the physical base that occupies the city and defined by natural factors (Rossi, 1984).

In another definition by Pakzad, the physical elements and physical urban landscape are classified to two natural and artificial elements. The urban landscape space component includes body of the city, floors, furniture, urban equipment, vegetation cover, water, etc. (Pakzad, 2006: 118).

3.2. Concept of Urban Walls

The façade of the building is like a shirt that displays the physical and visual character of a building. This elevation other than been unique is consistent with the body, the form, the street (Tavassoli, 2000: 42). Each building and architectural complexes located in the urban space must have visual relation with the outside and effective on the landscape features of its surrounding environment, which by locating several facades near to each other will create the urban wall. It is necessary that facade in visual terms follows principles and rules so that it has an effect on the aesthetic of the city.

The elevation of each building is effective in urban complex and this influence is transferred to street forms or squares. In fact, the urban façade consists of urban buildings. Therefore, in architectural terms it directly point out to elevation of the building (Pakzad, 2007: 82). In fact the wall of the building appears as a display façade of architecture combination. The architectural combination contains a kind of meaning and hence can stimulate the sense of human being and communicate with them. For this reason, major part of human communication with its surrounding environment happens through its visual and cognitive communication with the architectural composition of that environment (Safamanesh, 1994: 180).

Pakzad (2003), believes that the elevation is the partition of inside and outside of the building and as three dimensional element intersecting the characteristic and private aspect, the architecture of building, public and urban aspects. In this case, the façade is considered as a part of the body and urban landscape and has a wider role than the architectural role (Pakzad, 2003: 54). Pakzad calls façade as the surface constituent of each body and believes that each elevation is part of the body that forms the shell of each building. The façade is a factor that separates the inside and outside of

building and directly effects the function, value of the street and square. Street is a space composed of different architecture that the beauty of street from its physical dimension includes a set of street rules and their components are un-limited. The factors are wall proportion, floor proportion, color, skyline, consecutive view, rhythm, harmony, architectural style, projection, and depression. The aesthetic of street is the science of interpreting the components, the forms, and the street that should act in harmony and create a continuous set (Atashinbar, 2012: 14).

Table 2 Assessment criteria for physical identity

Distinction / Similarity	Distinction from stranger and similarity with itself
Continuity / Transformation	The connection with the past and non-discontinuity (continuity of meaning and self-values) along with innovation and creativity according to the time circumstances
Unity / Plurality	The connection between various and heterogeneous components in a way to create a whole

(Source: Godarzi Soroush, 2013: 103)

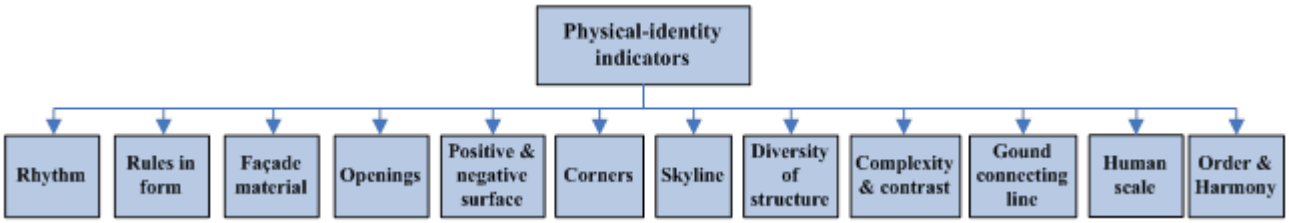

Chart 1 Indicators to assess the physical-identity characteristics of urban walls (Source: Author, 2018).

4. Investigating the Urban Walls in Hafez Street, Shiraz

The existence of forms and patterns proportional to the perception of citizens is necessary in an urban space. Today, in many developed countries, the existence of these forms in designing the urban walls plays a significant role in improving the quality of urban space. However, most cities of the country has faced this problem of inappropriate perception of the environment by the people. The most important planning of the urban planners is the formation of proportional spaces on the street that an individual by understanding this has the feeling of comfort and relaxation. The problem of the existing forms and suitable patterns of the urban walls is to improve the quality of space. The Hafez Street is one of the main and old street of Shiraz that the route accesses to several recreational and historical places like Hafezieh, Jahanama garden, tomb of Ali son of Hamzeh, national library, national garden, and Quran gateway; and many Iranian and foreign travelers pass-by this street everyday (Fig 1). But, the inappropriate forms and patterns on the street walls have caused the passerby not to be completely aware of the environment. Therefore, the presence of visitors in Shiraz and streets like Hafez has caused the need for suitable pattern and forms on this street to increase the visual and spatial quality (Fig 2).

Fig 1 Location of Hafez Street in Shiraz

Fig 2 Hafez Street condition and its wall (Source: Author, 2018).

5. Methodology

This study is based on analytical-applied research. The field survey and data collection method is through observations and questionnaire. The collected data are analyzed. One of the important techniques in data is the questionnaire for which it is necessary to determine the statistical population and sample size. First, to recognize the objective and subjective criteria, the wall identity has been used by the experts' views of architecture and urban planner. Accordingly, the sample size as per Morgan table is the population of Shiraz which needs 384 questionnaires. The questionnaire was distributed among common people and the other half among the experts in the field. The reason to select these two group, is that the citizens with respect to their experience have more realistic view, while the experts opinion are based on the scientific and technical knowledge. The views of citizens and visitors are used to organize, repair and changes of the street wall.

The purpose is based on the achieved data and views of experts and visitors, and the standard examined. To determine the probable problems of this questionnaire and to ensure its reliability it has been tested and the questionnaire is verified. One of the methods for calculation is the reliability of the Cronbach Alpha Coefficient. To calculate this in the study, a pre-test was done by distributing 120 questionnaires. Then, using SPSS software the alpha value for the entire questionnaire was determine shown in Table 3.

In the study of humanities, the alpha coefficient above 0.7 is acceptable (Azad and Momeni, 2003: 20). Therefore, with respect to alpha of each dimension and the entire questionnaire is more than 0.7, which confirms the desirable reliability of the questionnaire. Finally, the obtained data were analyzed using SPSS software.

Table 3 Cronbach's alpha of the physical identity dimension of the street walls

Physical identity dimension	Internal alpha	Physical identity dimension	Internal alpha
Scale and human size	0.793	Ground connecting line	0.799
Positive and negative surface	0.794	Skyline	0.817
Façade material	0.805	Complexity and Contrast	0.805
Proportion and harmony	0.807	Rhythm and harmony	0.796
Plaster	0.806	Type and opening forms	0.834
Variety of structure	0.803	Order and harmony	0.827

6. Evaluate and Analyze the Physical Identity Data

To analyses the data obtained from the questionnaire the descriptive statistic and prioritization of each indicator of physical identity were evaluated based on the viewpoint of people (visitors) and experts. The descriptive finding of the study, through the questionnaire was filled by ordinary people (Table 4), shows that the indicators of the ground connecting line, complexity and contrast, positive and negative surface, diversity of structure, human scale, and skyline had the maximum impact on the physical identity of the body and the street walls of Hafez Street. The indicators which had the minimum impact are corners, variables, order and harmony, building openings, façade material, proportion and harmony, rhythm in the body, and building façade (Table 4).

The result of the questionnaire survey completed by the experts show that the diversity of structure, complexity and contrast, ground connecting line, human scale, positive and negative surface, rhythm and harmony had maximum impact. The indicators with openings, order and harmony, proportions, material and corner, and skyline had the least impact on creating the physical identity of the street walls of Hafez in Shiraz (Table 5).

Table 4 Correlation test result between variables (ordinary people)

No	Indicator	Agree and completely agree	Disagree and completely disagree
1	Scale and human size	66.7	20.8
2	Positive and negative surface	75	20.8
3	Façade material	37.5	54.1
4	Proportion and harmony	45.9	41.6
5	Plaster	16.7	37.5
6	Diversity of structure	66.7	16.7
7	Ground connecting line	75	12.5
8	Skyline	62.5	20.8
9	Complexity and contrast	75	16.7
10	Rhythm and harmony	54.1	37.5
11	Type and opening forms	29.2	62.5
12	Order and harmony	20.8	75

(Source: Author, 2018)

Table 5 Correlation test result between variables (Experts)

No	Indicator	Agree and completely agree	Disagree and completely disagree
1	Scale and human size	79.9	13.3
2	Positive and negative surface	73.3	20
3	Façade material	20	73.3
4	Proportion and harmony	19.9	79.9
5	Plaster	20	73.3
6	Diversity of structure	93.4	6.7
7	Ground connecting line	79.9	13.3
8	Skyline	53.3	39.9
9	Complexity and contrast	86.7	13.3
10	Rhythm and harmony	53.4	46.7
11	Type and opening forms	6.7	86.7
12	Order and harmony	13.3	93.4

(Source: Author, 2018)

7. Conclusion

In this study, the criteria and parameters of the physical identity of urban walls has been presented by 12 indicators. The view of the visitors and experts visiting the Hafez Street using SPSS software were weighted, calculated, processed and analyzed. According to the views of visitors the indicators of ground connecting line, complexity and contrast, positive and negative surface, diversity of structure, human scale, and skyline; and views of experts indicators such as diversity of structure, complexity and contrast, ground connecting line, human scale, positive and negative surface, rhythm and harmony had the maximum impact in creating the physical identity of this street walls. Also, for the view point of visitor the indicators such as corners, variables, order and harmony, building openings, façade material, proportion and harmony, rhythm in the body and building façade; and openings, order and harmony, proportions, material and corner, and skyline had the least impact on creating the physical identity of the street walls of Hafez in Shiraz.

In some cases, the priority of the indicators of physical identity according to the views of the users of space differs with the priorities of the views of experts. This difference is due to the insight

of these two groups related to the urban issues. In fact, the citizens with respect to their experience had more realistic view, while the experts' opinion was based on the scientific and technical knowledge. In the future studies, the obtained result can be used to organize and optimize the wall and facades of this street.

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Revitalizing the Traditional Home Values of Shiraz in Today's Residential Complex

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Abstract

Traditional and historic house architecture in Iran, because of its special principles and values, is one of the patterns and honors of the architecture in this region and what is certain is to ignore and destroy those values in new living spaces. For this reason, since housing is the largest and most important man-made artifact, the application of traditional home architectural values can have a significant impact on the design process of residential complexes. In this regard, due to the disruptions in the residential spaces of our society today (Shiraz), it is necessary to pay attention to the concept of architectural values of traditional houses of Shiraz such as (introversion, privacy, flexibility, climate, nature). Following this view in this study, the goals are different aspects such as: recognizing the values of traditional house architecture, identifying the features of contemporary residential architecture and improving the quality level of residential complexes based on traditional architecture values of Shiraz. The present research is a qualitative research and data collection through library study. Library studies include topics such as traditional home values in Shiraz and the matching of traditional housing with modern housing. The use of S.O.W.T table to better analyze the site. The results show that some of the changes that have taken place in contemporary homes, such as the elimination of open space and interiors in today's houses, lack of attention to hierarchy and privacy in home spaces and residential complexes, lack of proper space for interaction. Neighbors and disregarding the behavioral needs of residents and their lifestyles have led to the instability in contemporary homes. Finally, according to surveys, solutions are offered to create residential complexes that provide suitable living conditions, human comfort and traditional home architectural values.

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Keywords: Residential Complex; Traditional; Shiraz City; Architectural Values Review

1. Introduction

In spite of recent decades of cultural and social changes and changes in the country, which have provided the ground for acceptance of foreign cultures, housing units offered in recent decades among small and traditional communities or families still adhering to past traditions. Not accepted. Disregard for the social characteristics and classifications and cultural values of the households, which, in some cases, is also associated with relocation of the dwelling, makes it difficult for people to refuse to live in these houses, so Are used (Sar Tipi pour, 2004). There have also been many efforts to secure housing due to rising demand for housing in Iran, but what is generally overlooked are the qualitative aspects of housing alongside their modest growth. The term quality has a broad meaning, indicating various indicators; therefore, qualitative indicators in housing planning studies should be considered in order to obtain a desirable housing status alongside quantitative development. Housing is the most sophisticated building in design. The design of this landmark is more than a response to the program because it must exhibit a public face as the inhabitants' private lives flow (Asefi, 2016). On the other hand, today the vertical expansion of housing and the rise of housing has seen unprecedented growth. With the increase in population and the phenomenon of migration on the one hand, and the decline in household size on the other, many native cities and existing cities grew in disarray. Lack of suitable land, a tendency to urbanize and commercialize housing increased congestion and housing, but in the meantime the vacuum caused by the removal of original and qualitative spaces, such as the courtyard and porch or the manifestation of inadequate terraces, after Decades are strongly felt (Mohammadi et al., 2014). It should be noted that traditional house architecture has always been influenced by its culture and climatic conditions. But nowadays, many factors reduce the quality of housing, dignity, security, peace of mind, such as the formation of economic attitudes rather than values, disregard for climate and disregard for climate, disregard for culture. And human needs pointed out (Delpasand et al., 2013). Although the elements and elements of architecture and construction are common in many cases, but over the last half century, these factors have been mobilized mainly for the construction of its lower structures, namely, overlapping and lacking in architectural ability. Design and construction in contemporary urban contexts is an individual and abstract exposure to the conceptual building without architecture. During this period, construction is preferred over architecture. Buildings have been formed by nature from the material and technology market, and to a small extent by the innovations of the time, and the negation of the past is clearly evident. Urbanization norms are also codified to restrict construction while neglecting architectural guidance and formation (Haeri, 2009). Chaos is one of the features of contemporary Iranian residential architecture. The undeniable personality that has taken root in Iranian architecture has fallen into this turbulent swampy environment like everybody else, and reaches deep into what is ultimately chaos. It is in this environment that the remnants of the remnant root are removed from the roots under the name of "correction" and "updating". Its examples are numerous. In one place, "Bin al-Haramain" destroyed hundreds of Shiraz homes and wiped out part of the 1400-year-old Shiraz map. To achieve a building that is superior to architecture (Memarian, 2010).

2. Methodology

The present research is by nature a qualitative research and data collection method as a library study. Library studies include topics such as traditional home values (introspection, privacy, flexibility, climate, relationship to nature) and matching traditional housing with modern housing. Which helps to understand the subject and its dimensions. It also makes the purpose of his research clearer and clearer. The field method involves attending a site and reviewing some of the traditional homes in Shiraz and conducting physical studies. Studying and photographing the site is done to get a better understanding. This observation includes a review of the quality of elements in the area and access to the site and how the building is positioned, as well as how it is designed, natural elements, and so on. Understanding the factors affecting the site helps to understand the existing space.

3. Research Hypotheses

1. It seems that applying the architectural values of the traditional houses in Shiraz can enhance the quality of contemporary residential complexes.
2. Given that the values of traditional houses in Shiraz are very high, the following issues have been discussed: introspection, flexibility of spaces, attention to nature, (Hierarchy) in this research, privacy is discussed.

4. Definitions

4.1. Housing

The word housing is actually the name of the place of origin of the dwelling, which is called the place of residence or stop. However, this term carries a diverse set of physical and conceptual concepts. In the statement of the Second Human Summit in Istanbul, Turkey, the word "appropriate shelter" was used instead of the word housing. And it explains that "a good shelter is more than a roof above every person. Rather, it means adequate privacy, access, adequate safety, occupancy security, adequate infrastructure such as water resources, sanitation and waste disposal equipment appropriate environmental criteria, health and location, and adequate access to workplaces and infrastructure facilities all They must be available at a reasonable cost" (Habitat, 2003, p. 22).

4.2. Residential Complex

Residential complexes can include a number of building blocks that can include different types of housing (single family, short and high rise apartment). Blocks can be combined in different forms and open spaces can be a meaningful link with buildings. They can refer to their privacy and distinct and distinct boundaries of urban context, which in some cases can be described as a physical-social island in the city (Einifar, 2005).

4.3. Traditional Houses

The traditional Iranian house has features that distinguish it from the contemporary home.

A: The traditional Iranian house has an interior and exterior. The word "yard" in homes is equivalent to the English central courtyard. Today, the term home refers only to the interior, though there is still a strong demand for exterior private space".

B: Family privacy is a key function of the traditional Iranian home. The traditional backyard reflects different levels of privacy and the private domain of homes: from the 'inner' world of

women and children to the more general and 'open' (outer) world of men and social engagement (Ardalan, 2010).

5. Architecture Patterns of Homes in the Past

In ancient Iranian architecture, home architecture was designed and built on specific principles and patterns. These principles were always followed in the homes of the wealthy and in the homes of ordinary people, so that in traditional architecture the simplest houses in comparison to the homes of the wealthy differed only in size and number of rooms and their layouts. In patriarchal homes, for example, there are sometimes wide varieties of homes that have more spatial diversity. According to the late Pirnia, the traditional patterns of house in Iran were as follows: (1) the four-vault pattern, (2) the summerhouse pattern, (3) Home pattern with central courtyard, (4) the house with the interior and exterior pattern. (Memarian Quote from Pirnia, 2008).

5.1. The Four Vault Pattern

The oldest pattern in homebuilding is the four-vault pattern. Some have even referred to those four houses. Because it has four rooms. This pattern has these spaces: there is a mid - shaped space that is covered with a greater dome of Colombo and it has four balconies in the four sides of it covered with four barrel vault. In the middle of the dome, a great hole opens up to the sky and giving light to the vaults. No pavilion is built on it, only the dome is built to a tall one, and nearly half of it is left open. On either side of the building and in the four corners of the house, four rooms are in vaults (Memarian, 2008). In some places, in the homes of four vault, chambers have a closet, and sometimes the vault have wind catcher. These houses have a farm by their side, the ground without the roof where the cattle are held. There is a garden around it, from behind the cavity wall, one of the vaults can be seen in the garden. This pattern has been very consistent with Iranian life.

First, it is an introvert, and this is in harmony with the Iranian culture.

Second, the temperature inside the inside is very low, and this pattern is cool in the summer and warm in the winter.

Third, this pattern can be covered by a dome and a wooden canopy. (Memarian, 2008).

The four – vault pattern has been the base pattern for all Iranian homes. The wide variety of this pattern is a home with the central courtyard, which is replaced by a middle skylight. But rural homes follow the same olden pattern. Nevertheless, the architecture of the house has always been in place, and in general it has to be said that the four -vault pattern has followed an evolutionary process. The rooms take Iwan's place, and the middle is so big that it becomes a central courtyard and can no longer cover it. An ancient pattern of four vault is converted into two patterns. One of the central courtyard houses, which take rooms the place of vault, or a spring house instead of vault, and two, rooms berver (summer house) and gooshvare (earnings) on either side take the place of the ancient rooms (gooshvare is a room on the second floor and on the upper floor, which sits on either side of the middle Hall. The room below is called the berver), and the second pattern where the pavilion houses are built on the basis of them (Abdullah zadeh, 2012).

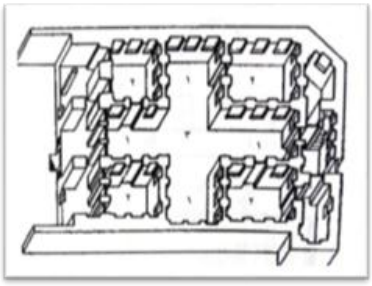


Fig 1 Spaces of a four-vault house (1-vault 2-room 3-between the house) (Memarian, 2008).

5.2. Summer House Pattern

In this model, on which the summer houses are built, the extension is inward, not outward. In this pattern, it closes around a four-vault house and only one side of a cavity wall opens to a garden. An example is a house in Ardestan. The half-covered mid-vault dome is completely covered, but the iwans that open to the inside open out in this pattern. All the summer house built-in gardens have the same pattern. An example of this is the Johan Nama Garden and Nazar Garden in Shiraz. They have a basin between four and four squares around them that open to the other. Another example is Eight Paradise of Isfahan. Other examples include Dolatabad Garden of Yazd and its windmill mansion as well as Fin Garden, Shiraz Delgosha Garden and Eram Garden (Memarian, 2008).

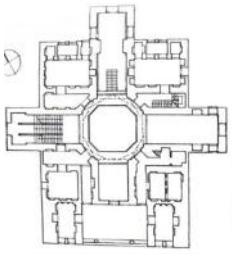


Fig 2 Delgosha garden plan of Shiraz. Source: (Naima, 2008)

Fig 3 Summer house pattern. Johan Nama Garden Summer house Plan Source: (Naima, 2008)

5.3. House Pattern with Central Courtyard

In the central courtyard houses, each section of the house is built in a central courtyard area, and sometimes there are three sides and sometimes four sides of the courtyard, the room and the

building. One opens to the south-east and the other to the south-west. They are both used because of sunshine in winter and in cold weather. The third one opens to the north-east, where the sun is blind and they use the heat. The fourth side of the courtyard is sometimes completely closed and has a wall where only the arch is built, because the sun is annoying and sometimes it is a platform, it is used only in the spring. On the fourth side, there is a washroom and a storage (Abdollahzadeh, 2012).

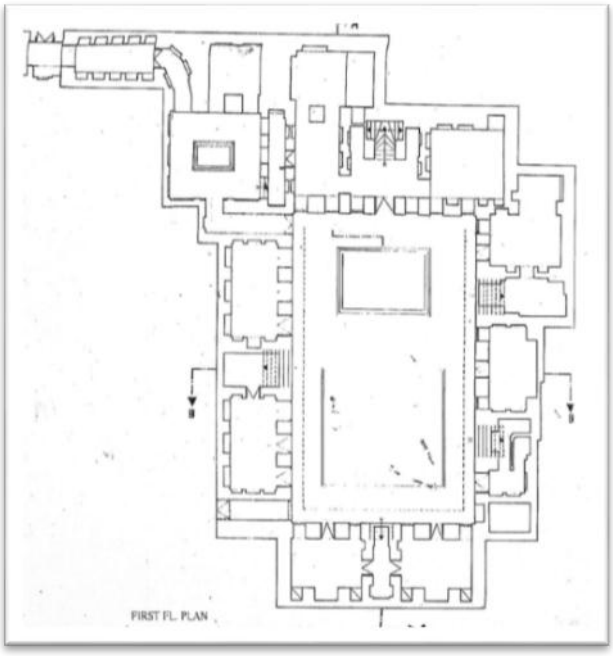


Fig 4 Tohidi House in the Sang Siyah District (Fars Province Cultural Heritage Office)

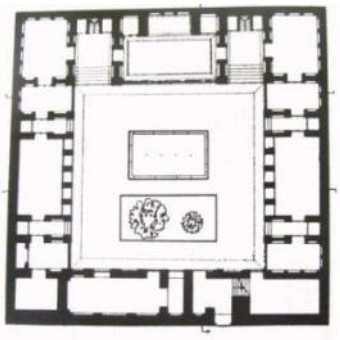


Fig 5 Kazerounian House, Shiraz, Central Court Yard Pattern. Source: (Architects, 2008).

5.4. House with Interior and Exterior Pattern

These houses have two parts: the exterior and the interior. The interior was larger and wider than the outside of the house and was dedicated to family life. It had a large central courtyard with lots of rooms built around it and welcoming guests to the outside. The outside had a yard (often a

central courtyard), a large reception room, a dining-room, and one or two rooms for guests' comfort (Memarian, 2008).

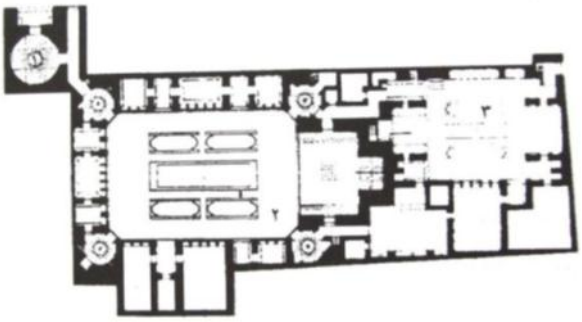


Fig 6 Yazd, Dr. Mortaz's House with Internal and Exterior Space (1. Entrance, 2. Internal, 3. External) (Memarian, 2008).

6. Architectural Values of Shiraz Homes

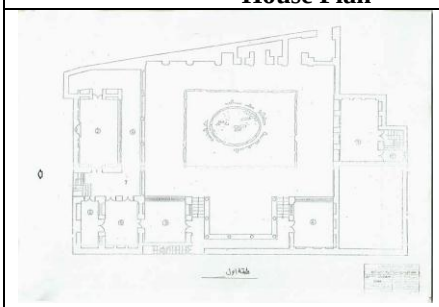
6.1. Introversion

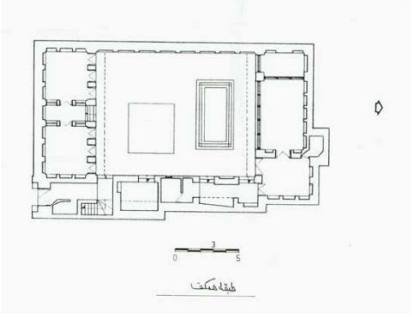
In Iranian architecture culture real value has been given to its nature and inner core. The outer shell is merely a virtual cover that protects the truth and its inner, enclosed food determines the true essence and existence of the building and is not comparable to the monies and outer space (Diba, 1999).Introversion before the architectural color takes on a moral and mystical point of view, including concepts such as being reserve, tending to the inner states, and avoiding pretending, not appearing, and instead the user on the inner states (Husseini, 2006). The issue of internal issues has been formed on the basis of culture, type of life, customs and worldview, which has its final meaning along with environmental, geographical and climatic issues (Diba, 1999). The features of an introverted home can be summarized in a few ways:

1. The various spaces are organized by an element such as a courtyard or covered shelves, and windows and باشو open to these elements.

2. Indoor spaces have no direct visual connection to outdoor spaces. In fact, the courtyard of these houses is their share of heaven and nature. A house that looks blind and clogged alley closes all eyes to the nature that is in it (Hosseini, 2006).

Table 1 Some examples of Shiraz traditional houses (introversion) (Writer)

House Plan	Traditional Houses of Shiraz
 **Saadat House** (Agency for Cultural Heritage of Fars Province)	**Saadat House** It is located in the old city of Shiraz, Dastghit Street, and the Sang Siyah Passage, From qajar period.

 **Tholai House (**Fars Province Cultural Heritage Office)	A**bdul Hamid Tholai House** This building is located in Shiraz old texture, Sang Siyah passage, Moghany alley, Farjum Impasse, No. 51 It belongs to the Qajar period.
Outcome: In both cases the creation of a central courtyard and an introvert association.	

6.2. Privacy

Privacy is taken from the Arabic root of the word (shrine). The confident and the secret can trust him.

Trusting someone to keep secret; alien. Unsuccessful. Invalid privacy; shelter. A person's home and the surroundings that are safe from invasion. "A close relative whose marriage is not permissible. We are not married.

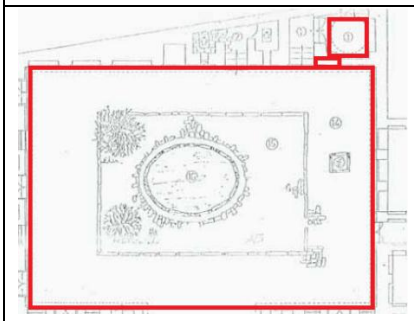
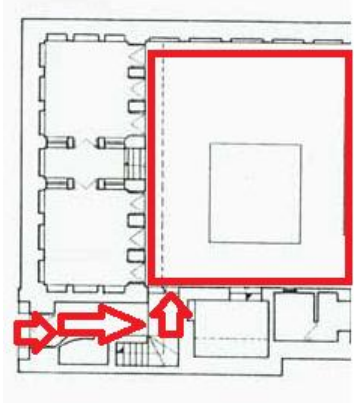
According to the meanings, "a space can actually be considered a confidential space that is physically safe for the user with privacy, security and security, and its spatial qualities are designed to provide comfort and comfort. It is a space that provides the material and spiritual conditions for the user to achieve confidentiality in all its various dimensions. (Dehkhoda, 2006).The Iranian family's life pattern is based on intimacy, cooperation, and social relationships. This means that intimacy between family members is also an important part of the Iranian life style. As a result, the importance of indoor and outdoor home spaces as a center of the world is of particular importance to the family.

Traditional Iranian families unlike contemporary minimalist families, there were extended families living under the roof with a cultural order and a parable.

On the other hand, hospitality and honoring the guest is one of the Islamic teachings that has been taken into consideration by Iranian cultural roots in the design of traditional Iranian houses.

The combination of these two important principles mean enclosure intimates and dearly beloved, to keep our guests, is one of the things that have been dealt with well in the traditional housing architecture of Iran. Usually called living room or five-door (Pirnia, 2002). Some rooms also used family rooms for business meetings in some homes. Guests were generally welcomed through a nearby pantry. The view of this room to the small outer courtyard was not the place of come and go for intimates, It gives a nice appearance to the guest of honor. Another important feature of traditional houses in Iran is their orientation towards Kiblah, in the direction of worshiping Muslims. The importance of coming home to Kiblah is one of the hidden beliefs of Iranian Muslims that their homes have also emerged in mosques and other manifest Iranian-Islamic architectures (Memarian, 2005).

Table 2 Some examples of traditional houses in Shiraz (Privacy) (Author)

Picture	Traditional houses in Shiraz
 **Saadat House** (Agency for Cultural Heritage of Fars Province)	**Saadat House** It is located in the old city of Shiraz, Dastghit Street, and the Sang Siyah Passage, From Qajar period. Hierarchy input and privacy.
 **Tholai House** (Fars Province Cultural Heritage Office)	**Abdul Hamid Tholai House** This building is located in Shiraz old texture, Sang Siyah passage, Moghany alley, Farjum Impasse, No. 51 It belongs to the Qajar period. Hierarchy input and privacy.
Outcome: Creating hierarchy at the entrance of houses by octaves and corridors was the reason for the confidentiality.	

6.3. Communication with Nature

Empathy and respect for nature has a deep place in Iranian culture. The courtyard, which is the heart of the house, is not the only enclosure without ceiling, rather, it is the particle of space that holds the universe. A piece of clean, family-friendly nature that accommodates the sky, light and water, respectively. The sky is infinite as we gaze upon it, relieved from the feeling of predicament and fatigue. Not only the backyard but also the rooftops and the moonlight give us this endless experience. Light is a symbol of the existence of righteousness. We do not know the light unless darkness, play with light and shadow in the traditional home has come to fruition. The corridors, the lattices, the sashes, etc. each provide us with some light. The nature that even in the Qur'an has been used to describe heaven is in Iranian architecture with windows up to the floor next to a pleasant house at the end we are offered generosity. Water symbolizes purity in Iranian architecture, Far from the heavy downpours or the roar of the high fountains, the gentle and whispering reflection of the sky and the colorful windows. The water fountain is an element that even gives the residents hilarity and vitality even in the smallest houses (Hosseini, 2006).

Table 3 Some examples of traditional houses of Shiraz (relationship with nature) (Author)

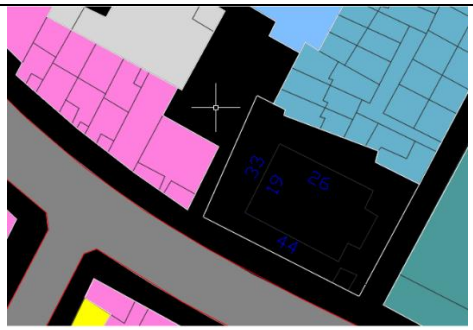
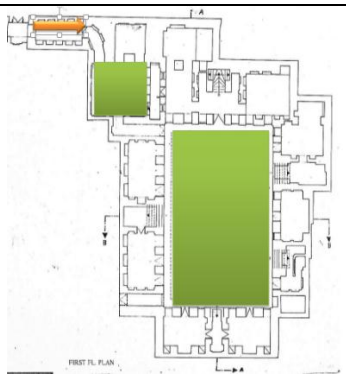
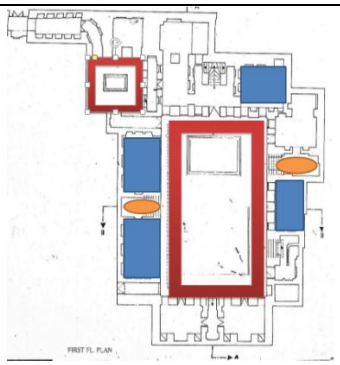
Picture	Traditional houses in Shiraz
 **Saadat House:** Relationship of all Spaces to Nature (Author)	**Saadat House**
 **Tholai House** (author)	**Abdul Hamid Tholai House**
Outcome: Creating green space using orange and sour orange trees, stone pools.	

6.4. Flexibility

Designers often have a tendency to be indoors for any type of activity Consider dedicated spaces. Privatization often makes it difficult to run other activities in a specialized environment (Raisi, 2007).Space users should be able to modify it as needed to make it easier to operate. This concept is called adaptation psychology. John Lang explains that when the environment is inadequate, it must change to respond to that activity. If the environment is not adapted to the activities of the users, it will eventually not be used and will become an abandoned environment (Abbas Zadegan, 2005). Species and factors of flexibility include "variability" and "varietal" and "adaptability" (Einfar, 2003).Varietal is the ability to provide different uses of space. This kind of flexibility comes with two space and time variables. Residential space can be used for several functions simultaneously and for different functions at different times. Adaptability requires the ability of a space to be adapted to new conditions. Variability also in flexible housing design, Increasing or decreasing the amount or separation and aggregation of spaces is referred to as the

possibility of returning to the original design of the resident unit after the area has been expanded or reduced (Einfar, 2003).

Table 4 Shiraz Traditional Home Values (Author)

Picture	Description	Elements
 **Detailed Design of old Texture (Municipality of Shiraz District 8)**	Creating large courtyards in homes Pay attention to the outdoors Example: In this house in the Ishaq beig neighborhood of Lotf Ali Khan Zand, the yard area is 494 square meters.	**Introversion**
 **Plane Tohidi house (author).**	Yard - Entrance (vestibule, corridor) - How the rooms are arranged Follow the hierarchy There are two courtyards for privacy in the Tohidi home.	**Privacy**
 **Plane Tohidi house (author).**	There are three spaces: outdoor - semi-open - indoor. Yard, porch, rooms. Tohidi home.	**Flexibility**
 **Tohidi Home (Author).**	Use of plants - water - wind - light Gardens (orange, sour orange trees) - stone pools for moisture.	**Attention to nature**

7. Revitalizing Elements of Traditional Home Architecture in Today's Residential Complex

Table 6 Revitalizing elements of traditional home architecture in today's residential complex (author).

<table>
<tr><th>Politics</th><th colspan="2">Strategy</th><th>Targets</th></tr>
<tr><td>Create open space inside (plan) and outside (residential complex site).</td><td>Central courtyard</td><td rowspan="3">Centre hierarchy</td><td rowspan="3">Introversion</td></tr>
<tr><td>Create input with pause space and define them.</td><td>Hierarchy at the entrance</td></tr>
<tr><td>Observe the distance between the blocks and their non-aristocracy.</td><td>Safety and peace</td></tr>
<tr><td>Creating private spaces (private living), public (public sitting in front), semi public</td><td>Space Security</td><td>Listening Privacy and Visual privacy</td><td>Privacy</td></tr>
<tr><td rowspan="3">Creating open space in the complex. Use of green terraces - create gathering spaces on the floors. Parental Bedroom - Children Bedroom - Guest Room.</td><td>Courtyard</td><td>Outdoor</td><td rowspan="3">Flexibility</td></tr>
<tr><td>Ivan</td><td>Semi-open space</td></tr>
<tr><td>Kitchen</td><td>Indoor</td></tr>
<tr><td>Building direction (Northeast - Southwest) - Use of light materials(appropriate materials) - Southwest winds</td><td>Sash Ceiling Lighting Summer house house Winter Underground</td><td>Building direction - Wind direction - Radiation direction - Materials</td><td>Climate</td></tr>
<tr><td>Enjoying the green space on the floors - Fountain use - Colored glass (light display)</td><td>Gardens (orange, sour orange trees) stone pools for moisture.</td><td>Use of plants - water - wind - light</td><td>Communication with nature</td></tr>
</table>

8. Conclusion

1. Housing is the space with which the resident is associated, the feeling of belonging between the space and the resident.

2. Establishing a home and living in a home is a technical, scientific and social matter, and therefore, it is not understood without regard to the creation of original spaces and the various phenomena involved in its formation.

3. The set of spaces that give rise to the internal body of a building, no one can follow any order that does not depend on their location.

4. Create spaces that are in keeping with traditional home values such as introversion, privacy, relationship with nature, flexibility.

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Identity in Residential Architecture from the Viewpoint of Semiology (Qajar Period Houses and Contemporary Residential Complexes in Shiraz)

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Abstract

The deficiency of Iranian contemporary housing architecture has made this method of Architecture unable to meet the needs of Iranian families in recent years. Architecture is part of the identity of a society and has concepts and features derived from the community of its time. Therefore, in order to provide a correct solution for the modification of the Iranian contemporary housing architecture and to create its identity, it is necessary to recognize and analyze the signs existing in Iranian architecture throughout history. In this study, the architecture of the traditional Qajar era houses and contemporary residential complexes in Shiraz, with a semiotic approach, were analyzed in two layers of architecture and meta-architecture. The results of semiotics mechanism, questionnaires and interviews showed that the lack of attention to different layers of the signified and conformity of the signifier and the signified is the missing link of identity in the contemporary architecture of residential complexes. Also, it seems that the application of Qajar architectural signs to contemporary housing architecture can create identity in modern housing.

Keywords: Semiotics; Sign; Identity; Texture; Semantics

1. Introduction

Concerned about the creation of a desirable quality in the architectural space, as one of the primary purposes of the architects and researchers in this field, attracted their attention to the

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concepts and procedures that their principles are based on human experience and the continuity of identity of the human beings achievements with the earlier generations and pre-knowledge of mankind. In recent years one of the most critical issues that have attracted the attention of universities as well as executive organizations and urban management agencies is the contemporary Iranian housing problems. What most scholars acknowledge in this regard is that contemporary Iranian housing cannot respond comprehensively to the needs of Iranian families (including cultural, social, semantic, functional, etc.). Some argue that the lack of knowledge, lack of professional beliefs, inadequate understanding of culture, ignoring the dignity and originality of the prestigious roots of the country, and many other issues have caused this crisis (Diba, 1999, p. 4).

2. Literature Review

Charles Morris, in the book Foundations of the Theory of Signs (1938), believes that human civilization is dependent on signs and systems of signs and that the human mind is not separable. He also believes that the concept of sign is essential to human science. Just as been fundamental the concept of the atom for physical sciences and the concept of cell for the biological sciences (Ahmadkhani, 2013, p. 1).

Semiotics addresses how something (i.e., a sign) implies something else (in the general sense of the word, which includes: feeling, emotions, imagination, and the like), and the recipient perceive the reality of signification. Semiotics not only consists of the study of things that in everyday conversations, we call them signs, but also the study of everything that refers to something else (Chandler, 2017, p. 20).

Based on semiotic knowledge, any work including an architectural building is a text, the reading of which is the interpretation of its signs by the user of space. From this perspective, architecture is also a kind of language (Schultz, 2008, p. 531), and since the language is a system of the related words (Saussure, 1999, p. 114), an architectural work is such as a text that words are the shapes, texture, and constituent parts of the building that, in addition to semantic dependence, often transmit their message through aesthetic and social connotation (Shirazi, 2002, p. 16). Signs are one of the semantic factors in understanding the concepts of architectural space and therefore play a significant role in the design process. Each architectural text is like a text that talks to the addressee. In order to communicate with architecture, the addressee also seeks to read the text and discover the meaning, in other words, make the meaning for the text. Architectural semiotics with the assumption that architectural elements, apart from their function, imply transcendental meanings quickly separates their path from functionalism in architecture.

Identity means personality, being and existence, and what identifies a person, expresses the characteristics of each person or environment. The identity, character, or quality of anything can be assessed by some criteria, whether good or bad. The art of architecture is one of the most important signs and features of the culture of every nation and historical period and represents the human environment at any time. What architecture has to be made, and how it has to be made, are two moments apart from a single phenomenon, the first as a cultural moment, and second, as a technological moment, and these two represent the architecture culture of individuals, groups, and societies (Falamaki, 2006, p. 163).

Architecture always and at all times is subjected to definite principles and criteria, and has a firm and unified link with culture, behavioural patterns, and values of society. That is why the architectural style of each period is a reflection of the culture and art of that period, as changes in architecture are proportional to the changes that take place in other areas of life. These changes are necessary for a dynamic and alive architecture to meet the new human needs. Architecture is part of

the identity of each society, and has the message, the concept, and the attributes of that society and the period in which it is born. Therefore, it depends on the geography, conventions, manners, insights, and knowledge of the people of society and the community history, and it can show all these dependencies (Hamzenejad & Dashti, 2016, p. 27).

From Rapport's point of view, identity is the ability to distinguish and identify an element from another element. He sees identity as a feature of the environment that does not change in different conditions. This property can be environment physical properties such as shape, dimensions, decorations, construction style, etc., or specific current activities in the environment or functions of an environment (Ghotbi, 2008, p. 81). The ideas, effects, and functions derived from the cultural features of an architectural artwork determine the identity of the architectural work. Factors such as beauty and knowledge and the originality of the plot are derived from a dynamic thought that creates a genuine, meaningful architecture (Torabi & Berahman, 2013, p. 107).

Identity has both static and dynamic aspects in terms of time. If the identity of architecture only had a static and non-dynamic aspect, then the architecture of historical periods should continue throughout history. While identity in architecture, like human identity, has both a constant and a dynamic aspect, which changes in every period (Matlabi, 2006, p. 57).

Table 1 Exploring the definition of identity in three historical eras, Reference: (Mahdavi Nejad, Bemanian, and Khaksar, 2010)

Definition of Identity		
Era	Concept	Architecture
Pre- modern	Man is the creator of God Identity is determine	Architecture emphasizes on human dignity Coherent architecture based on the principle of unity while multiplicity affected by restraints
Modern	The inversion of the world and the replacement of man and God	Architectural functionalism based on isomorphic and geometric monuments according to standards
Postmodern	The answer to the identity issue Modern Value Criticism Opposing ideology and metanarrative	Eclectic and turbulent architecture Imitating the past architecture

Accepting the assumption that architecture is the container of life, and life means the way of life and the relationship of human beings that arises from the culture of society, it can be admitted that architecture has an identity that expresses the cultural identity of its creator. Therefore, architecture in the first place represents the values that govern the society, and in the second place represents the values that society tends to achieve (Bemanian, Gholamirostam, and Rahmatpanah, 2010, p. 57).

Housing as the most elementary and popular skeleton of a city, it reflects the social, aesthetic, cultural and economic conditions governing the community during its period, which finds its physical and visual appearance due to architecture (Banimasoud, 2006, p. 288). House architecture plays a vital role in the formation of human personality and even their behaviours. House more than being a physical structure, is a foundation with multidimensional function influenced by society, culture, religion, economy, and environmental conditions, and since the construction of a house is a cultural matter, its form and organization are also influenced by the culture, which results in a house (Rapoport, 1969, p. 64).

Extracting the concepts and characteristics of Iranian architecture is impossible without deepening in social, cultural, religious, and literary issues. Hence, contemplation on Iranian housing and finding the characteristics of past houses can bring us closer to the cognition (Abdollahzadeh and Arjmand, 2012, p. 111). The apartment living is a response to an increase inclination to

urbanization, population growth, lifestyle changes from multi-family to single-family, which unfortunately have not met the users' qualitative needs. The past quiet and peaceful houses, which were the healthiest space for the growth of children and family, have replaced themselves with tight, dark, narrow, and noisy spaces (Shieh, 2002, p. 51).

The traditional home is, in a sense beyond the specific functions in the private and public realm and is in the sense of vitalizing a space for the realization of a human's lifestyle and behaviours. In the case of today's houses, called as residential units, have a meaning equivalent to habitation. When the meaning and depth of the house is reduced to a shelter due to various factors, including the desire for individual property and high house prices, it leads to quantitative and qualitative discontent in contemporary homes (Mirshamsi and Parva, 2011, p. 4).

The Qajar period was the period of conflict in values and architectural ideas, variation in urban architecture trends and methods. This variation and contradiction, influenced by various factors and approaches of tradition and modernity, is most pronounced in the field of residential architecture and made the uniform structure of houses of the city, different .The history of Fars in the Qajar dynasty is full of various events. This issue has caused many ups and downs in many parts of the city of Shiraz. In the last half-century, we have seen the construction and extensive presence of residential complexes in Shiraz using western patterns. These complexes, despite the time and financial costs, have not been able to maintain identity and adapt to native lifestyles.

During different periods, architecture has been influenced by political, social, economic, and cultural factors. Therefore, architectural analysis based on semiotic science is not possible without considering the various factors of meta-architecture and architecture. In this study, the semiotic approach was defined in architecture in the two-layer (architectural and meta-architecture layer). The meta-architecture layer is derived from society and cultural and social parameters, and the architecture layer addresses the structure of architecture.

Given that the home is the place where people have the most feeling of belonging in it and spend the most of their time there, the recognition of signs and symbols by using semiotics and its use in contemporary housing can be a way to achieve an identity architecture. Therefore, in this study, considering most of the houses left in Shiraz are related to the Qajar period, and since the closest historical period to the present time, in terms of the use of residential spaces, belongs to this period, reading of signs in the housing of Shiraz in this period and contemporary housing architecture in residential complexes (in Shiraz) based on syntagmatic and paradigmatic layers will be addressed.

The things that today overshadow the cultural identity of our architecture is that, after the enormous history behind us, we have significant problems in providing the basic definitions of architecture. This crisis, which has gradually emerged in the last century, is reflected more in the process of our society's art activities, and the weakness of the design, imitation without content, chaos, and lacking identity are its most prominent features. Therefore, it is not unreasonable to call it the identity crisis (Nadimi, 1991, p. 7). Thus, the necessity of this research is to provide a concrete solution to reform contemporary Iranian housing in terms of semiotics.

The product of the architecture is the result of a process. Hence, to achieve a desirable outcome in architecture, the process of attaining it should be modified. The starting point for this process is to change the attitude and approach to architecture. The primary purpose of this research is to read out the patterns of housing with identity. Eventually, the product of this research is the presentation of a specific pathway and solution for reforming contemporary Iranian housing to preserve the identity of Iranian architecture from the semiotic point of view.

3. Methods and Materials

3.1. Sample Selection

In this research, semiotics has been analysed in Qajar houses and residential complexes in Shiraz towards the achievement of the identity-based architecture. For this purpose, 15 remaining homes from the Qajar era and three contemporary residential complexes were selected and examined.

By considering the monuments of the Qajar architecture in the city of Shiraz, which dates back to the years (1888-1925) and since the reign of Nasir al-Din Shah, and due to the architectural features of this period that arises by sending out Iranian students to Europe and the impact of Western architecture on Qajar architecture, residential samples of this era were selected for investigation.

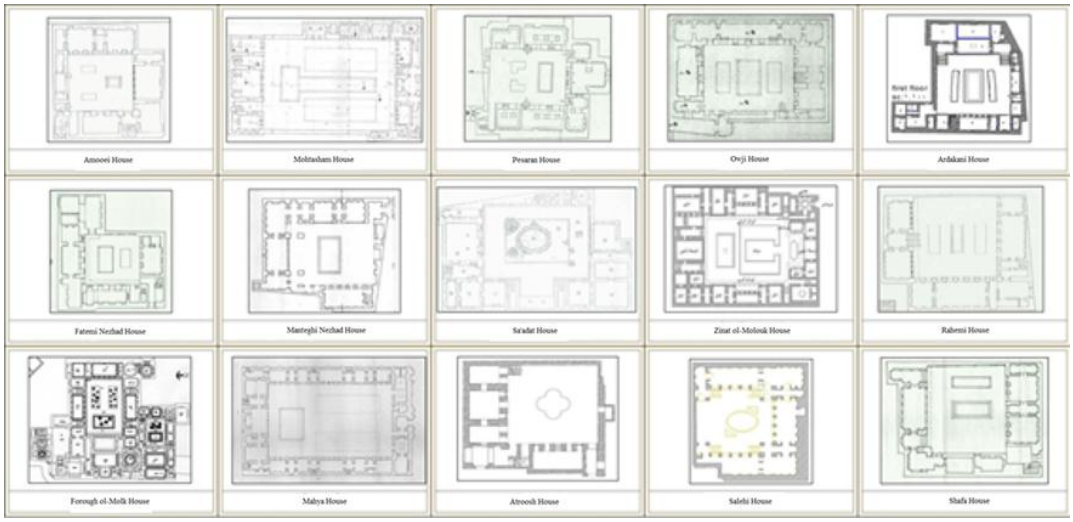


Fig 1 Sample of Qajar Houses in Shiraz (Reference: Documents available in Fars province cultural heritage organization, 2019)

Contemporary residential complexes in Shiraz are the three well-known and populated settlements in three different geographical locations with three different economic and social situations that were selected after field observations. Selection of samples with a large population of inhabitants leads to a large number of the statistical population in more diverse types of people, and architectural spaces of the examples are examined from different perspectives. These complexes are Derak Residential Complex, Chougan complex, and residential complex of professors in Shiraz.

Fig 2 Derak Residential Complex (source: Authors)

Fig 3 Chougan Residential Complex (source: Authors)

Fig 4 Asatid Residential Complex (source: Authors)

3.2. Statistical Population

The respondents in the questionnaire and the interview include two groups of people:

1. People with a history of living in traditional homes.
2. Residents of residential complexes.

Considering the recognition of the system of environmental meanings of historical spaces at the time of subsequent developments with regard to time interval should be done regardless of the scholar's thoughts, in order to be able to depict a picture of past meanings of space in today's world, it is necessary for respondents to be placed in the historical context. Based on this, respondents in group 1, in the form of a group of people on tour who have a history of living in traditional homes, have been taken to the Manteghi Nejad home to respond to the questionnaire by recalling the memories of the traditional houses based on the mental image that creates in their mind. Also, Group 2 respondents were questioned and interviewed in their residential complex.

3.3. Research Methodology

The first phase: Analysis based on the semiotic mechanism in architecture:

Fig. 2 shows the mechanism of semiotics, taking into account the typology of signs in architecture, which examines the signs in the architectural layer and meta-architecture layer, and each architectural product is analyzed by signing in to this mechanism.

The second phase: Preparing questionnaires and analyzing their results:

A closed-ended questionnaire was used to evaluate the users' perceptions of architectural spaces in residential complexes and users' semantic impressions of architectural spaces of the traditional homes.

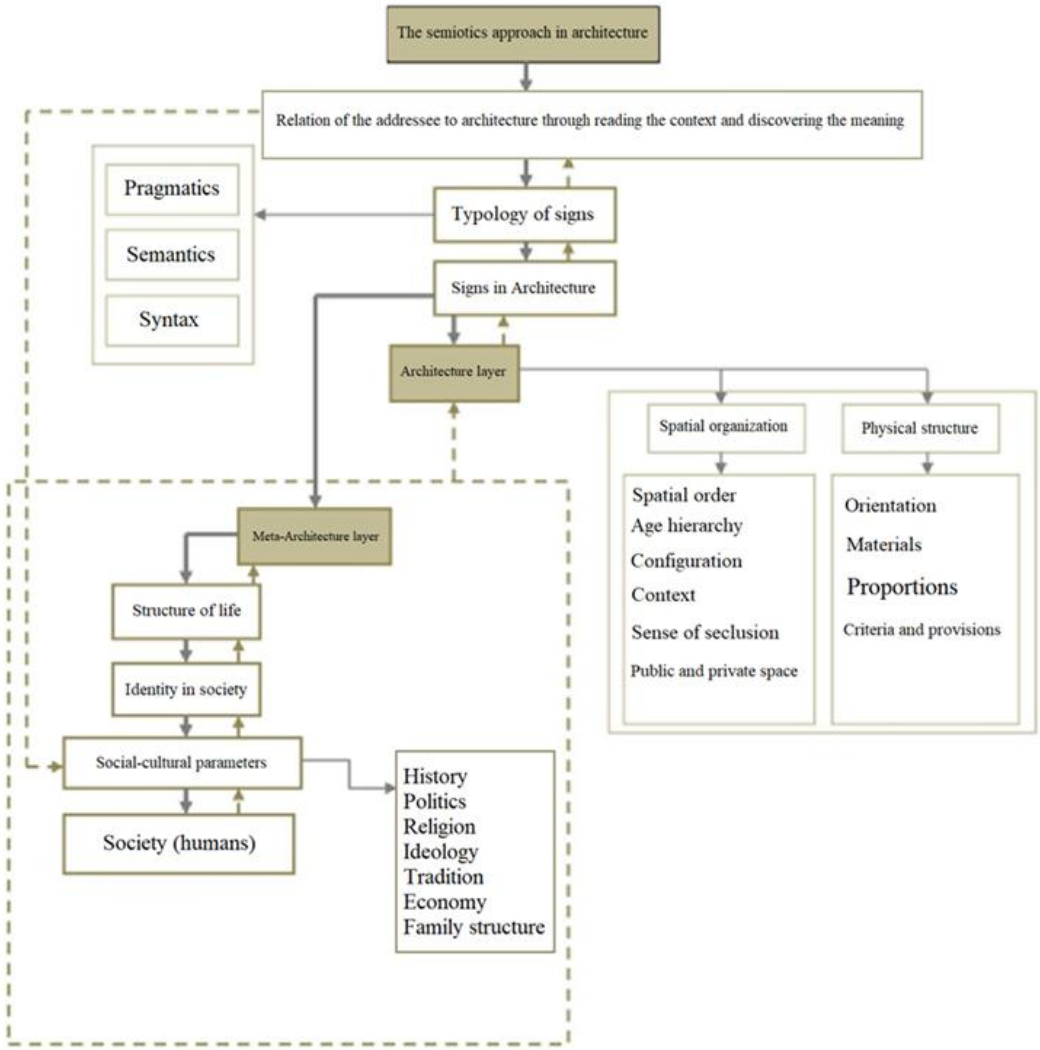


Fig 5 Conceptual model of semiotics mechanism (semiotics machine) in architecture (Source: Authors)

The third phase: Doing an interview and analyzing its results:

To extract and analyze the meanings received by users from the architectural spaces, in-depth interviewing with individuals was used based on the validity method to understand the relationship between people with the house and their semantic perception of the home space.

4. Results

At the first phase, samples were analysed based on architectural plans and documents, and library researches with respect to the semiotic mechanism for all samples, and then the results were collected.

Table 2 Investigating the meta-architecture layer of the semiotic perspective in traditional Qajar homes and residential complexes (Source: Authors)

Meta-architecture layer	Home historical period	Characteristic	Sign
History	Qajar period houses	Look at home as a permanent place for living	Home design based on present and future needs Plenty of rooms Multiple spaces to executing different celebrations and events
	Residential complexes	Home is a temporary place and to meet every day needs	Home design based on current needs limited rooms number
Politics	Qajar period houses	Lack of government role in the field of housing	Home design based on traditions and individual methods Home design according to the needs of the employer and bricklayer opinion
	Residential complexes	The impact of government policy on the number of children The Impact of government policy on providing a home for all families Impact of government policy on high rise construction and urban law in terms of reducing occupancy	Independent living in apartment units High rise construction and apartment living
Religion	Qajar period houses	The manifestation of religious values Paying attention to spiritual values Hiding the inside of the house to protect the confidentiality	High walls without openings to outside Divided spaces into indoor and outdoor
	Residential complexes	The manifestation of worldly values Paying attention to customary values Reduce the hiding and expose themselves to showing strength	Stretched windows and transparency in the facade
Culture	Qajar period houses	Beliefs based on religion, tradition and ethnic beliefs Consistency with personal characteristics and social traits accepted by society	Design based on culture and lifestyle Importance to the interior of the building
	Residential complexes	Influenced by contemporary culture and the culture of other countries The tendency towards modernism Striving to promote social dignity beyond themselves potency	Modern style design without considering the culture Use of new materials Importance to the facade of the building to attract the viewer
Tradition	Qajar period houses	Patriarchy at home Home as a place to do all the activities and occasions of family members (eating, seeing, visiting and celebrating, mourning, etc.)	Home spaces based on male rest and female workspace Spaces based on individual and social performance
	Residential complexes	All family members are involved in decision-making at home	Spaces based on the resting place of all family members

		Home as a place of rest for family members and the transfer of traditional family functions to the city (transferring the celebration, members, friendly visits, etc. to urban spaces).	Spaces based on individual performance
Economy	Qajar period houses	Houses construct based on the employer`s budget Not looking at the home as an economic resource	Space based on the needs and tastes of the employer Use of native materials and type of design according to the employer's and bricklayer's tastes
	Residential complexes	Improper distribution of financial resources Houses construct by the capitalists Home is an economic commodity	Space based on the taste of the capitalist Use of materials and type of design to be better economic efficiency for investor
Family structure	Qajar period houses	The family is multicore and clan Abundant social relationships between family members and relatives Different age ranges living together in a house Dividing the duties of women at home and men outside the home	The central pattern of the rooms Multi-functionality of spaces
	Residential complexes	Single-core family Reducing social relationships, and communications limited just to key family members Different age ranges live independently and at similar homes Dividing the duties of men and women, jointly inside and outside the home	Pattern based on the number of bedrooms for residents independently

Table 3 Investigating the architecture layer (spatial organization) of the semiotics perspective in traditional Qajar houses and residential complexes (Source: Authors)

Architecture layer		**Home historical period**	**Characteristic**	**Sign**
Spatial organization				
Spatial configuration	Exterior wall	Qajar period houses	Lack of drawing attention and without opening	Facade without decoration Facade without window
		Residential complexes	Facade as building shell	Simple window in the facade Use up-to-date and affordable materials
	Entrance	Qajar period houses	As a transition from place to place Indicates the privacy of two spaces	Indicator entrance, indirect Entrance with details of pre-vault, stone bench, knocker...
		Residential complexes	A route to pass and access to the residential unit	Entrance for vehicles Units separator door

	Open space (courtyard, porch, terrace, roof)	Qajar period houses	Paying attention to the cultural and functional role of open spaces Maintaining a functional and visual connection with nature Use of favorable condition of the open space climate	Yard as a service and moving space Porch as the joint inside and out Roof (private space) as a sleeping area Courtyard, porch, and roof with communication order and value
		Residential complexes	Random open space between blocks Open space shared between units	Courtyard, communication joint with the city space Terrace to maintain facilities and clothing Roof for shared installations Courtyard, roof and terrace lack communication order, shared and random
	Living space (rooms, service space)	Qajar period houses	Rooms are functional Kitchen location as a subspace	Room with three doors, five doors, etc. Traditional kitchen in the corner of the building
		Residential complexes	Rooms are for closet, furniture, and bed Kitchen location as the main element of home	Rooms with the standard architectural plan Open kitchen
Spatial order		Qajar period houses	Combination of open, semi-closed and closed spaces Functional diversity of closed spaces	Courtyard, roof (open space) Porch (semi-closed space) Room (closed space)
		Residential complexes	Use of maximum space for building area (urban development regulations)	Courtyard, roof (shared open space) House (closed space)
Public and private space		Qajar period houses	Pay attention to the hierarchical and indirect relationship from the outside to the inside Introversion with regard to religious, cultural and climatic issues Intermediate entry from the public space into the house	Central courtyard Vestibule and corridor Outer rigid wall Divide spaces into indoor and outdoor No opening to outside
		Residential complexes	Modern style no matter the cultural, religious or climatic issues Not paying attention to introspection Immediate entry from the public space into the house Using enclosures between buildings to solve the accesses	Window toward outside space Shared open area Public and private space approach together
Seclusion		Qajar period houses	Giving priority to the collective seclusion of residents The importance of the function of spaces Reduce the boundary of life between family members The importance of physical, visual and aural seclusion	Spaces based on function Use spaces such as the larder, corner to increase the sense of seclusion in the spaces Strong joints between spaces Separation of indoor and outdoor space
		Residential complexes	Giving priority to the individual seclusion Increasing the boundary between the lives of family members Using shared spaces to increase the building area of units Reduce physical, visual and aural	Private rooms for each family member Weak joints between rooms and service spaces

			seclusion	
Rhythm	Contraction, expansion	Qajar period houses	Horizontal expansion of space Range of vision and horizontal proportions	Low height building with horizontal expansion
		Residential complexes	Vertical expansion of space for more units Vertical proportions and enhanced upward visibility	High height building with upward contraction
	Presence, absence	Qajar period houses	Meaning in different spaces	Empty volumes Light-shadow game
		Residential complexes	Performance in space	Minimum housing or filled volume
	Centralization, Decentralization	Qajar period houses	Paying attention to the family gathering place	Courtyard
		Residential complexes	Attention to individualism Paying attention to the family gathering place	Living room and rooms have an equal value
	Unity, plurality	Qajar period houses	Home as a whole with order	Ornamentation - Unified function and construction
		Residential complexes	Too much diversity, too much boredom	Ornamentation - separate and discrete function
	Decrease, increase	Qajar period houses	Memorable, imaginative Creating a sense of curiosity	Shade-light-color
		Residential complexes	Simplicity, meeting essential needs	Undecorated
	Part, whole	Qajar period houses	The importance of the whole building The relationship between human and the environment	Shape and meaning are together
		Residential complexes	Human and the environment are two separate phenomena	Shape and meaning are separated

Table 4 Investigating the architecture layer (physical structure) of the semiotics perspective in traditional Qajar houses and residential complexes (Source: Authors)

Architecture layer **Spatial organization**	**Home historical period**	**Characteristic**	**Sign**
Orientation	Qajar period houses	Orientation based on the use of north, south, east and west light	Use of central courtyard and proper orientation
		Orienting of spaces according to spatial features	Design of spaces according to the desired use and appropriate climate
		Network structure and spatial independence	Spatial separation using intermediate distances
	Residential complexes	Orientation based on urban criteria	Light units only from the north, or from the south or north-south
		Orienting through objects and furniture	

		Aggregation of rooms into an area Cannot detect spaces when the doors are closed	Design of spaces according to furniture placement Spatial separation by using doors
Materials	Qajar period houses	Notice the symbolic features Considering economic issues Considering climate issues	Brick Cob
	Residential complexes	Use of new materials Considering economic issues	Brick Cement and Nano colors Washed cement
Proportions	Qajar period houses	The importance of geometry, construction, and scale	The visual order in whole and part
	Residential complexes	Considering the maximum use of space and the exterior of the building	Unordered and unused corners
Pattern and Criteria	Qajar period houses	The importance of geometry in design The importance of scale in construction	Dimensions of spaces using the scale
	Residential complexes	Importance of furniture and equipment	Dimensions of spaces according to standards of the architectural plan

In the second phase, different aspects of meaning were arranged in the form of a questionnaire. In the survey, the effect of individual, social, and environmental factors on semantic factors was examined. Results of the Likert scale and Friedman test indicate that the individual factor in traditional Qajar homes and contemporary residential complexes has the most effect on semantic factors and social factors having the least impact on semantic factors. Among the individual factors in residential complexes, the observance of public and private space has had the lowest value. While in traditional homes, remembrance of memories by visiting traditional homes has increased individual factors and ultimately semantic factors. The most important environmental factor in residential complexes that reduces semantic factors is the low level of relationship of home with nature, which reduces semantic factors due to Likert spectrum.

In the third phase, interview with individuals took place, and the signs of the interviewees were identified and determined with respect to the repetition of the subject.

Table 5 The obtained meaning and the proposed indexes from the interview results in the traditional Qajar houses (Source: Authors)

Case Study	Obtained meaning	Proposed indexes
Traditional houses of the Qajar period	High social communications between family members	Social interactions
	Long-time staying with family members, along with creating memories	Age hierarchy
	Social interactions between women at home	Room based on different uses
	Respect for elders	Private and public space
	Observing the age hierarchy	Privacy with respect to religious views
	Religious beliefs in respect to elders and religious grandees	The relationship between home and nature
	Different rooms for individuals	Materials and decorations
	Multi- functionality of spaces	
	Pay attention to lifestyle in designing spaces	
	Non-interference of public space with private space	

	Introspection according to religious beliefs Relationship of the home with nature, which was giving calmness and vitality Pay attention to home decorating Use of materials with an artistic glance Attachment to home

Table 6 The obtained meaning and the proposed indexes from the interview results in the residential complexes (Source: Authors)

Case Study	**Obtained meaning**	**Proposed indexes**
Derak residential complexes	Various use of the complex`s premises Security of complex`s premises There is a green space on the premises that cause calmness. No sense of privacy in the complex`s premises Lack of separation of public and private space in the premises Spatial priority to vehicles Lack of easy access Lack of social interactions at home due to inappropriate dimensions Lack of proper spatial separation for uses required in social interactions Lack of communication with nature Removing natural elements in the home Removing light from the house due to overlooking and curtains as a barrier Lack of different rooms for individuals Interference of the uses due to improper spatial organization Lack of attention to lifestyle in designing spaces Inappropriate proportions Creating a boring feeling through repetition and simplicity	Different uses of premises Feeling seclusion Private-public space Pedestrian and vehicle access Social interactions Spatial resolution The relationship between home and nature Room with different uses lifestyle Proportions Feeling boring
Chougan residential complexes	Lack of security and confinement in the premises Lack of a proper architectural plan There is a green space on the premises that cause calmness. Disregard for public and private space Not using the right materials for privacy Use of inappropriate materials Impact of economy on building quality Lack of compliance with the terms and conditions Lack of communication with nature Removing natural elements at the home Removing light from the house due to overlooking and curtains as a barrier	Security of premises Pedestrian and vehicle access Private and public space Suitable materials The impact of the economy on the building The relationship between home and nature Room with different uses Social interactions lifestyle Proportions

	Terrace as a place of installation and clothing Lack of different rooms for individuals Limited social connections due to small space Lack of attention to lifestyle in designing spaces	Feeling boring
Residential complex of professors	There is a green space on the premises that cause calmness. Security on the complex`s premises Men use the premises more than women Ability to perform various functions on the premises Lack of sense of seclusion due to the shared space of the premises Different uses for different age groups, and to meet the needs of residents Existence of confidentiality and separation of the public and private spaces Appropriate dimensions of the living room that led to the separation of the living room use The relationship between nature and home with plants and light Satisfaction with terrace environment due to the protection of confidentiality according to the religious view	Security of premises Feeling seclusion The effect of tradition in the space of the premises Social interactions in the lobby Various uses in the building Private-public space Privacy with respect to religious views The relationship between home and nature

5. Discussion

5.1. Analysis of the Survey Results of the Architecture and Meta-Architecture Layers

As we need a house for our bodies, we also need a house for our souls to compensate for our weaknesses. We need shelter to strengthen our mood and our inner aspirations (de Botton, 2009). Many of the needs that are expected from home are influenced by the life cycles of humans because when their age rises, their needs and obligations will change. If the architecture is not adaptable to the new conditions of life, it will not be sustained. Since the contextual architecture derives from the operation of various systems of signs (Soujoudi, 2004, p. 59), and with cultural, social and other components in the exchange of mutual systems, during its lifetime, it undergoes changes that arise from cultural transformations, changes in social structures and systems of value and meaning (Soujoudi, 2004, p. 341).

Accordingly, considering the case studies in the semiotics mechanism described in the previous section, the obtained information has been analysed in two parts as follows:

1. *Assessment of case studies based on behavioral patterns:*

The components of the signification of the architecture sign (activity-form-space) are combined in such a way that it creates a specific sign that is distinct from other signs. The combination of these three elements also makes the inhabitants' behaviors different according to the appearance of the signs, and a different kind of social behavior emerge in each one. Selected signs were collected from two historical periods according to behavioral patterns, and the analyses obtained from the previous section. The study of the meta-architecture layer in Qajar houses and contemporary residential complexes shows changes in the signs in terms of lifestyle.

Table 7 Signs in traditional Qajar houses and contemporary residential complexes according to behavioural patterns (Source: Authors)

Meta-architecture layer		Traditional Qajar houses	Contemporary residential complexes	Traditional Qajar houses	Contemporary residential complexes
Behavioral pattern		Sign	Sign	Characteristic	Characteristic
Everyday behaviors	Eating place	Room, porch, yard	Kitchen, dining room	Functional diversity of spaces Lack of spatial separation	Separation of space for specific use
	Sleeping place	Room, yard, roof	Private room		
	Meeting place	Porch, basement, yard, room	Living room		
	Cooking place	Traditional kitchen	Modern Kitchen		
Social behaviors	Communication with acquaintances	Five-door, three-door, dais	Reception room, living room	Lack of amalgamation of privacies	The amalgamation of privacies and no separation of personal and public spaces
	Partnering with the neighbor	Stone bench beside the entrance door	Entry and exit route of house		
Communication with the environment	Communication with nature	Semi-closed, open space	Terrace	A vision of nature and a direct connection to nature	Lack of vision because of overlooking
	How to access	Entrance, vestibule	Lobby, parking	Entrance with human priority	Entrance with vehicle priority

The above table and the survey of daily routine behaviours of residents in traditional homes and residential complexes show the difference in the characteristics of the signifiers used in the separation of spaces in accordance with the use. The existence of diverse spaces in traditional homes and the multi-purpose spaces in proportion to the required performance has created various levels of meaning. In addition to answering the needs of everyday life, the spaces in the Qajar houses connect human life to memory and dream and respond to different mental needs in different spaces. A traditional house attains identity from humans and also gives identity to them, and responds to the needs of the inhabitants by engaging the five senses. In the modern home, everyday needs are determined in fixed and specified spaces with a certain quality. The peripheral spaces in traditional homes have made life easier with respect to the lifestyles of the people; in fact, the existence of these spaces had been adapted to the lifestyle of the Iranian people, which today has been eliminated due to the reliance of designers on the architectural plans exist in the market.

In the traditional Qajar home, there were spaces for social communication in the home in proportion to the guest's prestige and strangeness which was offered higher quality space to the guests than other spaces of the home and with respect to the confidentiality protection of the residents of the house. In modern residential complexes, social communication within the homes takes place in the living room and reception room, which is often the same. Social communications outside the home, which mean places, where the conversations take place, is carried out in traditional homes in a place such as stone bench beside the entrance door and residential complexes in the lobby. Security, the existence of necessary arrangements, the feeling of seclusion, and the quality of the architecture will create identity. The amalgamation of privacies in the architecture of

contemporary residential complexes diminishes the architectural identity. In residential complexes, green spaces are residual constructed residential spaces that are not planned or designed. Such areas do not create any sense of belonging or ownership in them. Therefore, they do not feel any responsibility for keeping these spaces and using them. The yard has been removed as a multipurpose architectural space in traditional homes over time, and the successor to this layer was the enclosure space of residential complexes that could not be considered as a suitable alternative in terms of spatial features and environmental qualities.

2. Assessment of case studies based on removing-texture and creating-texture layers:

Different signified in home and the selected symbols suitable to it, in relation to each other, establish the total space of the house that, while providing shelter, create an atmosphere with identity and satisfy the human's spiritual need. In this section, according to the definitions of the texture, the layers are studied separately and reviewed their effects on each other in different spaces of the house. Then, considering the meta-architecture layer, the interaction between the layers of the signs in the housing texture of the case studies was investigated, and the effect of these layers on the removing texture and the creating-texture of the houses in order to establish architecture with identity has been analysed. The parallelism of the layers leads to creating-texture in the architectural layers and, as a result, creates architecture with identity, and the removing of texture leads to the lacking of identity in the housing architecture.

Table 8 Investigation of creating-texture and removing-texture layers in traditional Qajar houses to contemporary residential complexes (Source: Authors)

Architecture layer		Alteration of Qajar traditional houses to contemporary residential complexes	Investigating the layers considering creating-texture and removing-texture perspective
Spatial configuration	Exterior wall	- Removing introspective facade - Adding extraverted facade	The contradiction of confidentiality and economics causes to remove the texture of the housing contextual layer.
	Entrance	-Removing vestibule -Deleting entrance details (pre-vault, and platforms) -Adding lobby - Adding car keeping space	Removing the vestibule element and encountering the hierarchy of entry with vehicle entry and maximizing use of the building cause to remove the texture of the housing contextual layer. The addition of car keeping space due to the evolution of life in the current era cause to create the texture of the housing contextual layer.
	Open space (courtyard, porch, terrace, roof)	-Removing yard space -Removing functional roof space -Removing porch -Adding green areas between the complexes - Adding terrace	Removing private spaces and converting them into joint building spaces is leads to the encountering of performance and confidentiality with economics and standards, cause to remove the texture of the housing layer.
	Living space (rooms, service space)	-Removing the variety and multi-functionality of rooms -Removing the larder -Removing traditional kitchen - Adding open kitchen	Removing the various functions and side spaces of the rooms are lead to the encountering of the function and the lifestyle and are effective to remove the texture of the housing layer. Converting the traditional kitchen to the modern kitchen due to the evolution of life in the current era and development of technology in food storage and cooking creates the texture of the housing layer. However, the removing walls and opening the kitchen is lead to the facing of the function and the confidentiality and cause to remove the texture of the housing layer.

Spatial order	-Removing spatial composition - Maximum use of the building area and closed space	Removing of open, closed and semi-open spaces and the use of the entire building area have reduced the relationship with nature in order to preserve the economy and causes to remove the texture of the housing contextual layer.
Public and private space	-Removing hierarchy -Removing indoor and outdoor space -Adding window toward the outside environment - Approaching public and private space	The interplay of public and private space causes the loss of confidentiality and is effective in removing the texture of the housing contextual layer.
Seclusion	-Removing joints between spaces -Removing the thickness of the walls between spaces - Adding room for each family member	Dedicating the room to different people due to lifestyle changes creates personal seclusion and is effective in creating the texture of the housing contextual layer. Removing the thickness of the walls and joints causes' loss of audition and visual seclusion, and due to confidentiality cause to remove the texture of the housing layer.
Rhythm	-Removing uniform skyline -Adding elevation -Removing empty and full spaces -Removing yard -Adding living room and private room -Removing the holistic approach of building design -Removing interior decoration (shade, light, and color) - Removing the outside environment from the inside environment	Increasing the elevation in order to reduce the building area has led to the upward visual focus. With the conversion of the courtyard into an open space between the building complexes, the focus on the yard has disappeared and the central space of the house has been changed to the living room that due to its lack of connection with nature, it has been removed the texture of the housing layer and has failed to provide quality features shade, light, etc.
Orientation	-Removing central courtyard -Removing orientation - Removing the light from the four sides of the building	Lack of lighting in new residential buildings on all four sides has caused the home has no connection with nature and to function as a removing-texture.
Materials	- Removing native materials	Replacing native materials in accordance with the climate and economy, with modern materials to encourage people to buy and compete with each other, cause to remove the texture of the housing layer.
Proportions	- Removing the holistic geometry	Removing the proportions in the whole building, plans, and decorations have caused to remove the texture of the housing layer.
Criteria and provisions	-Removing scale -Adding municipal regulations - Adding furniture value	Municipal regulations, according to national building provisions in line with urban development have caused to create the texture of the housing layer.

5.2. Analysis the Results of the Questionnaires

The results of the questionnaire show that individual, social, and environmental factors have the most effect on semantic factors, respectively. Among the residential complexes, the Derak Residential Complex has the maximum semantic factor for the inhabitants and shows the effect of architectural signs on the creation of architectural meaning and identity. Therefore, aspects affecting social factors in contemporary housing design can increase the semantic factor and hence, give identity to architecture. The effect of individual factors on the semantic factor indicates the importance of this factor in creating meaning for the user and also, giving identity to the housing architecture.

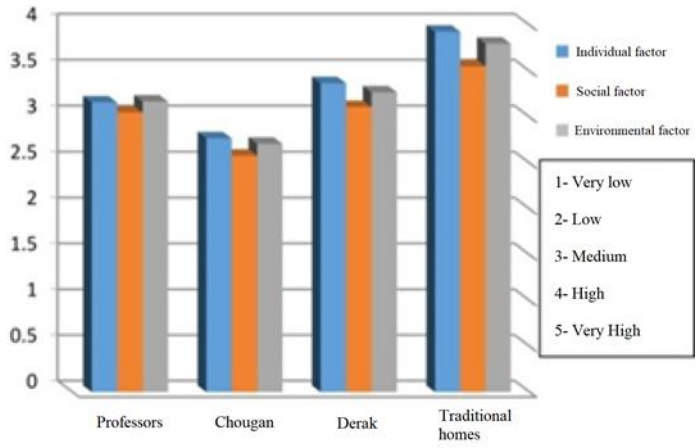


Fig 6 Comparison of contemporary and traditional home residents' viewpoints on individual, social and environmental factors derived from the signs of the entire home space.

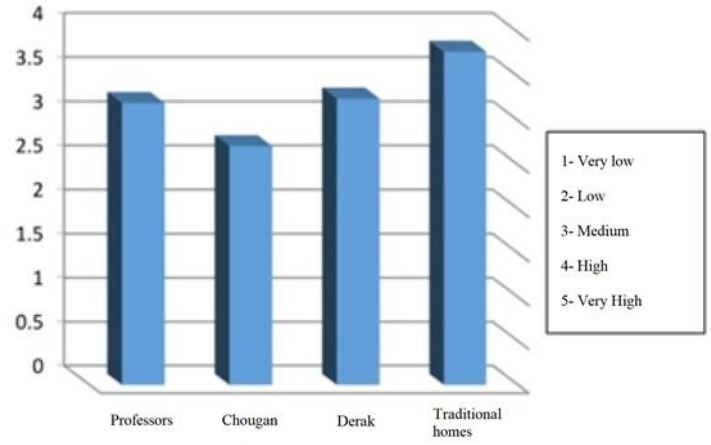


Fig 7 Comparison of contemporary and traditional home residents' viewpoints on semantic factor derived from the signs of the entire home space.

5.3. Analysis Results of the Interview

In this section, the expressed indexes from the result of interviewing residents of the case studies were analyzed according to the semiotic mechanism. The relation or no relation of the above signs with the architectural and meta-architectural layer has been analyzed and showed how the sign were selected in the samples.

Table 9 Semiotics analysis of proposed indexes in the Qajar period houses in Shiraz (Source: Authors)

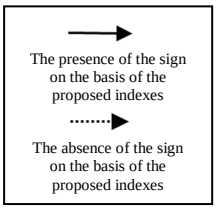
Case Study	Proposed indexes	Analysis based on semiotics
Traditional Qajar house	- Social interactions	1. Family structure, social-cultural parameters, :hitecture layer 2.Configuration, spatial organization,

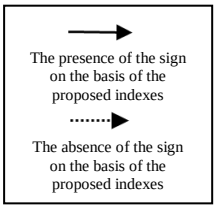
		architecture layer
→ **The Presence of the sign on the basis of the proposed indexes** → **The absence of the sign on the basis of the proposed indexes**	- Age hierarchy	1. Tradition, social-cultural parameter, meta-architecture layer 2. Family structure, social-cultural parameter, meta-architecture layer
	- Room according to different uses	1. Spatial order, spatial organization, architecture layer 2. Configuration, spatial organization, architecture layer
	- Private and public space - Privacy with respect to religious views	1. Private and public space, spatial organization, architecture layer 2. Religion, social-cultural parameter, meta-architecture layer
	- The relationship between home and nature	1. Criteria and provisions, physical structure, architecture layer 2. Configuration, spatial organization, architecture layer
	- Materials and decorations	1. Materials, physical structure, architecture layer 2. Proportions, physical structure, architecture layer 3. Context, spatial organization, architecture layer

Table 10 Semiotics analysis of proposed indexes in the residential complexes (Source: Authors)

Case Study	Proposed indexes	Analysis based on semiotics
Derak residential complexes → The presence of the sign on the basis of the proposed indexes ⇢ The absence of the sign on the basis of the proposed indexes	- Different uses in premises	1. Spatial order, spatial organization, architecture layer 2. Configuration, spatial organization, architecture layer
	- Feeling seclusion - Private-public space	1. Feeling seclusion, spatial organization, architecture layer 2. Private and public space, spatial organizati architecture layer
	- Pedestrian and vehicle access	1. Spatial order, spatial organization, architecture layer 2. Configuration, spatial organization, architecture layer
	- Social interactions - Spatial resolution	1. Family structure, social-cultural parameter, me architecture layer 2. Configuration, spatial organization, architecture layer
	- The relationship between home and nature	1. Criteria and provisions, physical structure, architecture layer 2. Configuration, spatial organization, architecture layer
	- Room with different use	1. Spatial order, spatial organization, architecture layer

	- lifestyle	2. Configuration, spatial organization, architecture layer 3. Family structure, social-cultural parameter, meta-architecture layer
	- Proportions	1. Proportions, physical structure, architecture layer
	- Feeling boring	2. Context, spatial organization, architecture layer
Chougan residential complexes	- Security on the premises	1. Spatial order, spatial organization, architecture laye
	- Pedestrian and vehicle access	2. Configuration, spatial organization, architecture layer
	- Private and public space	1. Private and public space, spatial organization, architecture layer
	- Appropriate materials	2. Materials, physical structure, architecture layer
	- Appropriate materials	1. Materials, physical structure, architecture layer
	- The impact of the economy the building	2. Economy, social-cultural parameter, meta-architecture layer
	- The relationship between home and nature	1. Criteria and provisions, physical structure, architecture layer 2. Configuration, spatial organization, architecture layer
	- Room with different use	1. Spatial order, spatial organization, architecture layer
	- Social interactions	2. Configuration, spatial organization, architecture layer
	- lifestyle	3. Family structure, social-cultural parameter, meta-architecture layer
	- Proportions	1. Proportions, physical structure, architecture layer
	- Feeling boring	2. Context, spatial organization, architecture layer
Residential complex professors	- Security on the premises	1. Spatial order, spatial organization, architecture layer 2. Configuration, spatial organization, architecture layer
	- Feeling seclusion	3. Feeling, spatial organization, architecture layer
	- The influence of tradition in space of the premises	4. Tradition, social-cultural parameter, meta-architecture layer
	- Social interactions in the lobby	1. Spatial order, spatial organization, architecture laye
	- Presence of various uses in building	2. Configuration, spatial organization, architecture layer
	- Private-public space	1. Private-public space, spatial organization, architect layer
	- Privacy with respect to religious views	2. Religion, social-cultural parameter, meta-architecture layer
	- The relationship between home and nature	1. Criteria and provisions, physical structure, architecture layer 2. Configuration, spatial organization, architecture layer





- Privacy with respect to religious views	→	3. Religion, social-cultural parameter, meta-architecture layer

6. Conclusion

Achieving a residential architecture with identity necessitates a comprehensive and systematic definition of semiotics, which can present some solutions to the lack of identity in housing architecture in the form of an organized model.

The study of semiotics in traditional Qajar houses shows the existence of meaning in an architectural product that influences its identity. The semantic factors derived from individual, social, and environmental factors influenced the house and architectural identity. Therefore, the relation between the used signs and the meaning received by the respondent was the first step of this research hypothesis. After examining the hypothesis and the relationship between the signs, it can be described that the creation of a sense of identity in traditional Qajar houses was due to the direct and appropriate relationship between the signifier and the signified.

The architect's attention to the meta-architecture layer, the lifestyle and the demands of the society at first has made the client's morale and needs to be known, and the design of the appropriate signifier has satisfied the residents of these houses. The use of architectural signs in this period contains all of the meaningful behaviors of the users of this period and can be read and interpreted through semiotics and pay attention to the signifies of different layers. From this perspective, the architecture of this period is presented as a symbol of individual and social identity. Shaping, building features and the usage of signs have originated from the spiritual needs and lifestyles, and by emphasizing the turning-points of space, the effective features of the symbol (element/space) to create meaning and experience of aesthetics are discussed. Therefore, the adaptation of the signs considering the semantic aspect of the sign, their emergence in terms of the pragmatics, as well as the proper selection of signifiers, have led to the creation of identity in the houses of this period and their meaning. Examination of the samples, the sense of belonging and nostalgic feeling created by the experience of being in these places, illustrate the influence of the signs in creating the identity of homes in this period.

On this basis, it seems that not paying attention to the different layers signifies the lack of conformity of the signifier and the signified is the missing link of identity in the architecture of the contemporary residential complexes. Two reasons: 1. Lack of content studies before design and the designer's insufficient cognition of lifestyle (due to the multitude of units and households), and 2. Inappropriate sign (signifier) choice despite the cognition of the signified (due to the designer's mistake and giving priority to economic benefits) has led to the loss of identity in these complexes.

Based on the factors mentioned above, any architectural sign used in housing should have the following characteristics to be able to create an identity:

1. *Significant relationship of the sign with the meta-architecture layer:*

The results of the library research of the meta-architecture layer (history, politics, religion, culture, tradition, economics, and family structure) in traditional houses show a significant relationship between the meta-architecture layer and the signs used (Table 2). Attention to the design of the architectural sign considering the features of the society in the Qajar houses has made the addressee connected better to the living environment. The use of architectural signs in each period must correspondent with the conditions and characteristics of the society so that the architecture can be harmonized with what the addressees expect of it to create an identity.

2. *Significant relationship of the sign with the architecture layer:*

The results of document review and library research of architecture layer (spatial organization and physical structure) in the traditional Qajar houses show the characteristics of the sign that, by establishing a proper relationship with the individual, has created an identity in the residential architecture of this period (Table 3 and 4). Architectural signs in each period and in combining with other symbols must convey the appropriate meaning to the user while creating a proper image in the mind of the addressee and preserving its function.

3. The meaning of the sign from the addressee's point of view

The semantic analysis (individual, social and environmental factors) of traditional Qajar houses through a questionnaire in this research showed a direct relationship between semantic factors and creation of identity in architecture, and the role of environmental and social factors in creating semantic factors was expressed by Friedman test. Besides, the indexes presented in the interview of traditional dwellers examined in (Table 7) shows how the architectural sign of this period relates to the indexes that have created identity in the residential architecture. Thus, the architectural sign must conform with the conventions and symbols of the language of each society so that the addressee can interpret the meaning within the context of their society literature, in which case architecture with identity is produced while conveying the appropriate meaning.

4. Creating-texture relationship of signs with layers and the other signs:

Investigating the relationship between the textual layers of traditional Qajar houses shows the creating- texture relationship between different layers of the home, such as functional, economic, aesthetic, and so on (Table 8). The creating-texture relationship has led to the synergy between the textual layers and, consequently, identity in the residential architecture of this period. Therefore, each architectural sign must, while maintaining its characteristics, be able to create an identity in relation to other signs.

5. Significant relationship of the sign with the behavioral patterns:

Examination of the behavioral patterns in the three sections of daily behaviors, social behaviors, and relationship with the environment mentioned in (Table 7) shows the characteristics of the signs versus the behavioral patterns and thus the architectural identity. Architectural signs must be based on behavioral patterns so that they can create an identity based on residents' lives while maintaining performance.

Therefore, to create an identity in contemporary housing architecture, the architect must, while understanding the meta-architecture layers which impact the process of production of the architectural product, obtain a complete knowledge of the conditions and requirements of the home dwellers so that architect can design appropriate architectural sign. Understanding the sign needed, on the one hand, and how the sign is designed in terms of architectural features that carry different meanings, on the other hand, is effective in creating identity. The designed sign must have the stated attributes to create the identity that provides the user need and reading of it provides the meaning the user needs. The designer should re-read the semantics of sign from the user point of view in the process of architectural design after designing the sign and modify the sign accordingly.

In contemporary residential complex architecture, the selected signs are formed based on giving priority to layers and signified that cause the process of removing-texture. The absence of some signs (space/element) does not mean that the layer has destructed and, despite the existence of signified in contemporary homes, ignoring the layers, giving priority to some layers and lacking proper substitution in the selection of sign, has caused the removing of the housing context texture. It seems that the syntagmatic or paradigmatic of signs of the Qajar era houses in contemporary housing, considering the signified of this period, can create identity in contemporary housing.

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Home Architecture Data Mining from a Spatial Structure Perspective (Case Study: Jangjouyan House)

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Abstract

Information technology has led to significant advances in various sciences, including architecture, causing fundamental changes in the quantitative architectural research. In this regard, space syntax is one of the techniques used in space structure analysis that has created new horizons in digital modeling and design. From the syntactic theory point of view, space is the primary core in the state of social and cultural events. Moreover, rather than the attributes of space being individually definable, the relationship between activity and space can be perceived and defined within the existing relationships between the spaces as well as the relationships between spaces and the relationships between the addressees and social interactions. Through the desk and field studies and while getting familiar with the "Graph Theory" and the principles of space syntax (node, connection, spatial arrangement, convex space, and justified plan), this study attempts to evaluate the architecture of Qajar period from another perspective by describing its mathematical relationships in terms of total depth, mean depth, degree of spatial integration and the value of spatial control, and examine the relationship between spatial coexistence in an example of Qajar houses in Esfahan, and the House of Jangjouyan (Warriors' House) in particular.

The method used in this study is a descriptive-analytical one with a case study strategy, for which the definitions of "Gross Hopper" and" Space syntax" are used to quantify it. The present study introduces for the first time the value of control in space, which implies the adaptability of space as

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This paper is taken from the author's Ph.D. thesis entitled "Contemporizing the Genome of Traditional Architecture (Data Mining the Relationship between Mass and Space in Indigenous houses in Isfahan)" under the supervision of Dr. Mohammadjavad Mahdavinejad and the advisor Dr. Darab Diba, it has been done at the Science and Research Branch, Islamic Azad University.

one of the indicators of flexibility. The results indicate that the courtyard positioning in the middle layers and its relationship with the intermediate spaces including the corridors, stairs, and partitions create a significant role for it, leading to its flexibility in the spatial configuration, while the location of yards in the primary layers in the contemporary homes has declined in importance and this role has been transferred to other spaces.

Keywords: Graph; Space Syntax; Spatial Configuration; Housing; Spatial Depth

1. Introduction

"Humans do not come to observe the constructions, but a wider world is hidden behind every architectural structure that humans come to see it" (Merleau- Ponty, 1962).

The meanings that the man-made environments and physical characteristics induce are the cultural and world-view principles and values of society that form the environment. The artificial environment, with its symbols, proportions, symbols, shapes, colors, and other attributes, reflects both the worldview and culture that provide its formation, promoting the required principles and values to the human beings that somehow play a part in the cultural developments (Naghizadeh, 2002: 62).

Thus, a construction requires a body, whose spirit demonstrates the spirit of culture and worldview of the community (Naghizadeh, 2002: 64). As a result, human understanding of the design problem is nothing more than clarifying the values, identifying priorities, and taking into account the goals that play an important role in fulfilling the design needs and potential factors. (Pourdeyhim, 2011: 13).

The house plays an integral role in the treasure trove of Iranian architecture as the embodiment of architecture and culture, and "one of the most important forms of social organization is the space with its dual nature, as on the one hand it is influenced by culture and on the other hand it affects it" (Ilka, Mansouri, Nasir Salami and Saremi, 2015: 166).

As a familiar subject to which humanity has a long and extensive relationship, a house a place to live and feel comfortable, which has always been considered one of the most basic and important human needs in history. Understanding the home and its place in the system of social relations between people and society is possible by taking into account all the symbolic, institutional, material and aesthetic aspects of the home, or "culture" of the home. These dimensions find cohesion and interconnection and form the "home culture" in "the anthropology of home" and with the help of the concept of culture. (Fazeli, 2008: 27).

Regarding the hardware and physical basis, housing is subject to the requirements of the time and the laws governing the material elements and human experience of the use of building materials and facilities and urban infrastructure, but regarding the software aspects, it is dependent on beliefs, values and cultures dominating the architect and the community.

Considering the native architecture of Iran reveals the role and special position of the house as an important element in architecture. The patterns are used in the design of indigenous homes in Iran, which are influenced by many factors such as climate, culture, social relations, etc. The pattern of housing architecture has also changed in contemporary architecture, with the change in lifestyle, population growth, land scarcity and other factors, (Asefi and Imani, 2016: 57) and this has led to leaving the Iranian architectural patterns. (Mahdavinejad and Shahri, 2014:32). Thus examining the old houses and analyzing the characteristics of the different types and uses of indigenous homes can reveal the common qualitative values (Asefi and Imani, 2016: 57) that can be used to meet the

challenges of contemporary architecture (Mahdavinejad, Tehrani and Karam, 2011: 205). However, more detailed knowledge of native architecture is needed regarding the developments in the field of architectural science and technology as a source of inspiration for the architects, to extract its practical implications. (Mahdavinejad, Tehrani and Karam, 2011: 206).

Locating spaces and the state of the relationship of spaces with each other are among the most important principles that can be explored and analyzed in the home culture. For this purpose, the space syntax method has been chosen as a technique for discovering the mathematical relationships in spatial configuration and interconnection relationships. It is an exploratory method that simultaneously tests the relationships between data and analyzes the degree of unity and duplication of data. In this method, no assumptions or structures are imposed on the data, and the data is allowed to determine the next steps itself.

2. Materials and Methods

Each work, including an architectural construction, is as a text, the reading of which is interpreted by the space user. From this perspective, architecture is also a kind of language (Nuremberg Schultz, 2008: 531), and since language is a system of interdependent words (Saussure, 1966: 114), an architectural work is similar to a text, whose words are the volumes, textures, and constituents, which often convey their message through the aesthetic and social codes, while they are semantically dependent. By travelling through this context (architectural), the viewer reads or views the important aspects of the work on the basis of his prefaces and presuppositions. (Shirazi, 2002: 13). Accordingly, "textual architecture" is connected to the time, thus becoming temporal and time-dependent (Raeisi, 2010: 50). The timing of the textual architecture reading process is the product of relationships that are interpreted as intertextual relationships.

Thus, the surrounding environment changes through a continuous process of transformation, and becomes so-called historical (Johansen and Larsen, 2002: 4), the transformation of which takes place through intertextual relations. Hence, "intertextuality" is a concept that implies the participation of a work in the discursive space of a culture (Culler, 1981: 114). Therefore, "intertextuality" involves the interconnection of layers of one phenomenon with those of other phenomena (of the same or non-congruent type), which results in the aesthetic and social cryptographic evolution of the textual architecture in the simultaneous and temporal relationships (Noghrehkar and Raeisi, 2011: 7).

The result of reviewing the native architecture leads to a correct understanding of the built environment and to lead to architectural and cultural patterns. Native forms and aesthetic values refer to parts of the language and are derived from symbols and social values. These symbols and symbols derive from personal and social identities and, in fact, represent social values and are the only way to protect the cultural and technical heritage of a civilization (Salingrus, 2014: 19).

Since the today's architecture of Iran is in its entire alteration from its past architecture, it should be possible to read its past architecture with the available tools to the today's architect. Reading the right architecture leads to building the right architecture. What follows from this reading can replace the unconsciousness. In other words, the past architects used their treasure trove of information, and today's architects can use the latest information in their new ways.

These transferred experiences are a kind of architectural culture heritage, and the products of this heritage reflect the temporal and spatial architectural culture of that particular land; the values that are the product of collective culture (Memarian, Hashemi Toghroljerdi, and Hamzehnejad, 2012: 248). It should be noted that the recognition of the past is not meant to be referring to the past, since this reference is principally ignored, and any emphasis on it will not lead to anything but the

imitation or staging. However, knowing and being aware of the process of developments in the past will be beneficial for the future actions. Thus, recognizing and measuring the criteria of "authenticity", "integrity" and "relative value" of historical constructions can play a valuable role in making new changes and developments (Hanachi and Fadaeinejad, 2011: 16).

Research in earlier works is bringing the collective memory to the present that has become meaningful over time and at a particular place and is one of the identifying factors; an emotion that has been going on throughout history and has been institutionalized within the individual of the community (Taghvaei, 2012: 70), having roots in typological values and can be analyzed and evaluated in two forms of hidden species or biological patterns (genotypes) and physical species (phenotypes) (Memarian, Hashemi Toghroljerdi, and Hamzehnejad, 2012: 248).

This knowledge addresses two completely different needs: on the one hand, it is a way to understand and control a complex system, and on the other hand it is a necessary tool in the design, by the aid of which the requirements can be made with consistent performance and structure.

In this way, the rules that link the patterns (nodes) are as important as the patterns themselves; similar to the words that cannot create a language without compound laws. A coherent combination of patterns creates a new pattern at a higher level, which also has additional properties (Salingrus, 2014: 12-13).

Importantly, the invention of a new template language does not require its complete replacement with an old template language. The coexistence of competing or complementary patterns is usually desirable and even necessary, especially if the new models (operating at different scales) have different positions in the language hierarchy. If these new patterns are properly connected, the richer and more stable systems will be established (Salingrus, 2014: 23).

It is to note that it would not be possible to analyze the evolution of an architecture without examining the evolution of its components or elements. On the other hand, any architectural work has the potential to be divided into two systems: the system of form and the system of meaning. Every form can exist based on the semantics, and the understanding of each meaning is made through the understanding of the form system. Hence, the meaning is the prerequisite for shaping with respect to any architectural work. The semantic system can be interpreted in two ways:

A) Discovery of the meaning: Referring to the time and place of the production of the work provides enough context for understanding the meaning of the form. In other words, it seeks to indicate the yesterday's meaning as in yesterday. In this rule, the researcher goes a step further for the required finding and removes the other semantic layers of other periods.
B) Creating the meaning: Adding other semantic layers to the work after accomplishing it. In addition to involving the primary meanings, this method also involves other concepts with respect to different times, which can be expressed in two different ways: Today's form may be the same as that of yesterday's, while its meaning may have changed over time; or the yesterday's form might have had extensions at different times up to the present day. Therefore, semantic layers would be created for the time layers.

Analysis of each architectural element in the form and meaning system has the following features and regulations based on the components:

A) Position: The system indicates the relation to the whole work in the mathematical situation of the form system. In other words, not every single element with a definite scale will have similar semantic implications in terms of different deployments.
B) Scale: This property represents the semantic differences caused by the change in the scale and size of an element. In other words, an element with a definite form at different scales has different semantic implications even with the unified deployment conditions.

C) Relationships: This attribute refers to the semantic and form transformation of an element in a composite form; i.e. the semantic and form aspects of an element in two singular and combined dimensions with other elements are different from one another, in such a way that the meaning and form provide a different meaning and form in the combined basis as compared to the singular condition.

D) Place: Place is the basis of meaning and form. Hence, understanding and perceiving each form essentially relies on the recognition of two contexts: human space and spatial human. In other words, differences in the conditions of locations make spatial humans, by which different human places express themselves in the form and meaning through these differences. In this case, a single phenomenon will have different results for different spaces. The most important feature of the relation of form and meaning to place is the identity. Human spaces and spatial human are influenced by internal and external factors in their evolutionary process, which have different dimensions.

E) Time: Transformations that form and meaning take in each architectural element in the time vector are classified into four different modes: First, form is produced in time in proportion to the evolution of meaning, and there is unity between the two dimensions. Second, the form has not undergone a change in the time and the meaning has not also encountered any transformations, in which case the form is re-emphasized due to having the semantic basis. Third, the form has left over time, but its meaning has been transformed. In this case, semantic replacement has occurred. Fourth, the form has evolved due to various reasons beyond the continuity of its place, and the meaning is left over time. In other words, a historical break has taken place and its identity has undergone a transformation. In the second and third modes, the form gets a symbolic expression and becomes timeless (Hosseini, 1999: 91).

According to Nicolaas John Habraken, the three main aspects of the social structures of a building are spatial organization, physical structure, and the light systems. He specifically points out that one of the most relevant aspects of human behavior is the "spatial organization". He also argues that the social role that has a particular space plays in the building is entirely based on its position in the transition from the public space to the private one (Habraken, 1988: 7).

The “Space Syntax Theory” or “the Space Layout”, devised by Philip Steadman, Bill Hillier, and Julienne Hanson, consists of the tools or techniques that can analyze the spatial structure of a building and help identify the considered potential of the past architecture in order to reuse them in order to adapt to the conditions and technology of the day, and accordingly achieve a pattern for the contemporary architecture design.

Understanding these relationships is developed based on Graph Theory in the form of mathematical relationships and can be explored in terms of the concepts such as depth of space, rate of integration, control value, and the choice value, which are discussed as follows.

2.1. Justified Plan or Drawing the Spatial Graph

"One of the achievements of the space syntax technique for analyzing the spatial relationships of a building is drawing a plan or the justification diagram" (Soheil, 2016: 47).

A drawing tool called a plan or justification diagram is used in order to extract the necessary information and read the hidden pattern and social relationships in the spaces. The term “justification” refers to the process of organizing the graph with the relative depth of the nodes from a space. This diagram shows the built-in communication features of the plan. In this regard, a structure based on the graph theory should be drawn for each space, which is referred to as “plan

justified structure" or "J-graph". In this structure, spaces are drawn as nodes and the relationship between spaces is drawn by lines.

The nature of this connection, which may be a door, a window or a ladder, is ignored, and only the fact that there is a connection between the spaces is recorded. Each surface or layer is displayed with dotted lines. This process converts the plan into a circular node diagram that are interconnected by lines and are accessed in different layers. Conventionally, the length of the lines and the dimensions and the size of the spaces have no effect on the graph.

Thus, the outermost space is named as the carrier or root node and is placed at the zero layer. Then, based on the different access and choices available to reach each space, a crest of the considered space is drawn to the first available space and an access level is defined with each new node and based on the type of access, for different layers to be formed. In fact, a bubble diagram can be achieved by the access levels and layers (Fig. 1) (Hillier and Hanson, 1984: 112; Ostwald, 2011-b: 739).

2.2. Depth

Organizing the living environment is possible by clearly defining the private and public areas and creating the spatial hierarchies, and defined living areas also enhance the sense of belonging and provides the identity to residential environments (Einifar and Aghalatifi, 2011: 17).

The depth of space coincides with the concept of territory; it is an intrinsic property that can provide human comfort. The territory is not only a space issue but also a social phenomenon (Shahbazi, Balali Oskoei, and Shahabi, 2017: 70). In fact, the territory is the situation and location of a community in the space; it is a prominent tool for moving through a simple space that can be seen as a supportive mechanism for the basic life requirements such as identity, motivation and security (Lawson 2002: 168). The physical, functional, social, perceptual-mental, cultural, and time factors are considered as the six indices of territory, some of which are subjective and the others are objective. However, the geographical-cultural factor is considered as the basis for other factors (Einifar and Aghalatifi, 2011: 19). The concept of depth has a social meaning. Increasing the depth indicates the separation of public and private surroundings. It means that if an individual wants to enter a building, he should pass a distance of a space from the origin in order to get closer to the private area. It indicates the social hierarchy or a social performance (Tabatabaei Malazi and Sabernejad, 2016: 77). The depth of the space is one of the most important effective factors on the quality of relationship between humans and space (Einifar and Aghalatifi, 2011: 18).

It can be said that depth is the number of spaces that need to be passed from one space to another, or to reach a specific axis or node. The depth index indicates the degree of separation of one space from another. In case of greater depth of space, it means that more space must be traveled to reach that space, and thus that space is more isolated (Masoudinejad, 2007: 11).

Depending on the depth, there are two parameters: the total depth and mean depth. The total depth refers to the spatial structure of the whole set, while the mean depth is a criterion for measuring the depth of each space relative to the extent to which the space in question is more private or public.

It is also important that increasing the depth of space, in addition to the separation, also increases the degree of spatial privacy. This indicates that the greater depth of the space complex causes the spatial hierarchy, the reduced access as well as accessibility to some other spaces, leading to greater control of space. Therefore, with increasing the depth, the controllability of the space is increased, resulting in the creation of the privacy factor in the environment (Heidari, Ghasemian Asl and Kiaei, 2017: 24).

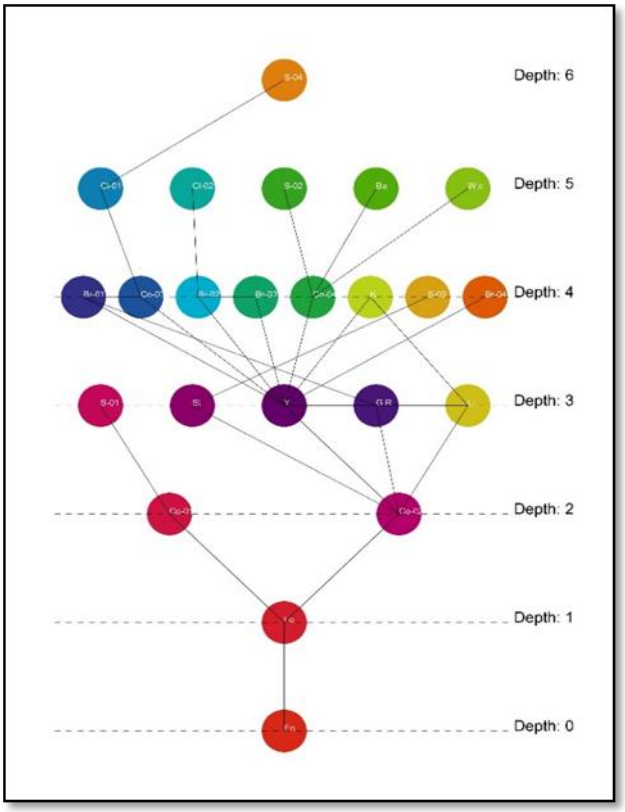


Fig 1 Spatial graph of the House of Jangjouyan from the entrance (Author)

The concept of depth in architecture is an expression of the attempt to express the conceptual and the gradual aspect of the perception process. This principle suggests a fundamental pattern of connectivity, transportation, and reception in order to reach a space such as a room, which expresses the extravagant aspect of reception in the space and emerges as a hierarchy of outside access (Zarei and Yeganeh, 2019: 102).

Depth in the architectural space also has a close concept of flexibility. Architectural flexibility is illustrated by the indexes of variability (the potential of different uses of one space), adaptability (potential to adapt to other spaces in different conditions) and variability (potential to change the spatial structure of a complex) (Kiaei, Soltanzadeh, and Heidari, 2019: 65). They are the indicators that play an important role in identifying the space efficiency (Hillier, 2007: 229).

Space performance efficiency means minimizing the influence of unrelated groups and properly organizing the related spaces along each other, which can be analyzed with the help of the concepts from space such as depth, connectivity and integration. (Peponis, 1985). Therefore, as the more public the space becomes, the greater will be the diversity of activities in it, and the more private the space, the more the diversity of activities diminishes, especially those related to the public domain of the home (Eika, 2015: 3-5).

By analyzing the set of factors that affect the degree of public aspect and privacy of the space, the degree of variability in its current activity and, consequently, its degree of flexibility can be analyzed and evaluated. One of these factors is the analysis of the influence of the space. The quality of influence indicates the access to different parts of space and has a direct relationship with

the amount of public or private aspects of the space. That is to say, increasing the influence means increasing the access to a space and thus making it more public and decreasing the influence means reducing access and thus making it more privatized (Kiaei, Soltanzadeh, and Heidari, 2019: 65). In addition to the visual accessibility index, the factor of influence can be analyzed using the spatial depth factor (Bentley et al., 1986: 162).

2.3. Total Depth (T.D)

The total depth denotes the number of trips an individual has to make from one space to another. In other words, the sum of the multiplication of the number of nodes (nX) of each surface at that depth (L) is referred to as the total depth (T.D) (Ostwald, 2011-a: 452) and is calculated as follows (Fig. 2):

$$\mathbf{TD} = (\mathbf{L_0} \times \mathbf{n_X}) + (\mathbf{L_1} \times \mathbf{n_X}) + (\mathbf{L_2} \times \mathbf{n_X}) + \cdots + (\mathbf{Lx} \times \mathbf{n_X})$$

2.4. Mean Depth (M.D)

The mean depth is the degree of depth of the node in the justification graph. By the comparison of the total depth and the mean depth, it can be concluded that the depth of a room that is above the mean range is more private than a room that its' depth is below average (Ostwald, 2011-a: 452). The method of calculating the mean depth (Fig. 2) is as follows:

$$\mathbf{MD} = \frac{\mathbf{TD}}{(\mathbf{n} - \mathbf{1})}$$

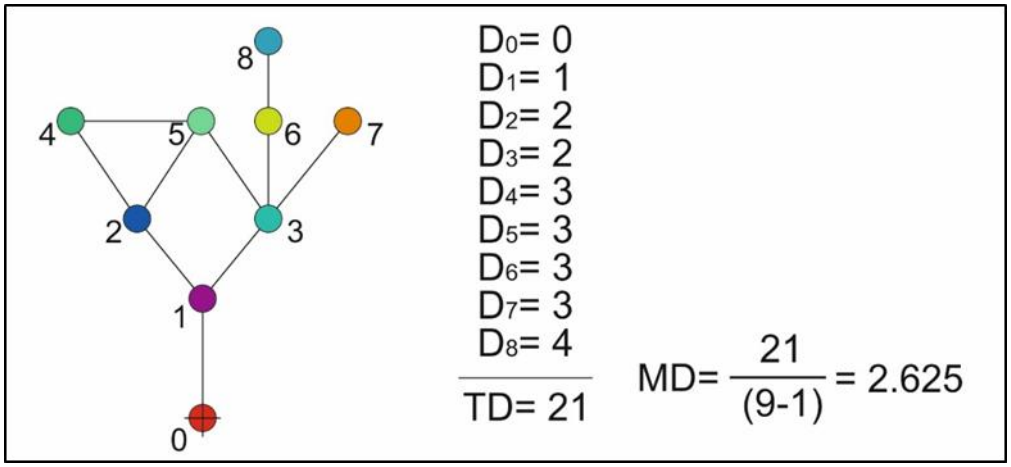


Fig 2 The graph and calculation of the total depth and the mean depth (Author)

Relative depth also defines the spatial domain as the basis for determining the degree of privacy and generality of each space, so that the mean depth lower than the relative depth value indicates the degree of public degree of the space.

2.5. Integration (i)

Dehkhoda dictionary refers to "integration" as “relative” and Moein dictionary considers it as "two or more people having interconnection and relation with each other". Both of these dictionaries seem to use the word “integration” for human relationship, while in the theory under discussion, the word “accretion” has a more significant expression than “integration”. It can be argued, however, that integration provides more weight for the overlap of human relationships discussed in space syntax (Hamedani Golshan, 2015: 86). Therefore, the important point in evaluating the interrelated structure is the spatial relationships and the continuity of its elements. (Bazrgar, 2003: 85). Integrity is a measure of accessibility. This criterion indicates to what extent the path is integrated or separated from a system as a whole (Ostwald, 2011-a: 457).

Interconnection or integration is the main concept of spatial syntax, which represents spatial cohesion (Melazadeh, Barani Pesian and Khosrozadeh, 2012: 86) and is the average number of interfaces, by which all the spaces can be accessed. In other words, the mean number of changes is the direction, from which the other spaces can be reached.

Integration is a concept of communication, not of distance, and therefore more closely related to the concept of depth than distance. In fact, the integration expresses the spatial consistency and the rate of interconnection of a space with other spaces (Masoudinejad, 2007: 15), i.e. the greater the integration in a space, that space has a higher consistency and integration with other spaces and the general spatial organization. Moreover, it has higher accessibility (Molazadeh, Barani Pesian and Khosrozadeh, 2012: 86). Evidence has shown that high precision integration axes absorb higher density of motion (Didehban, Pourdayhimi and Rismanchian, 2013: 44).

The space integration and differentiation have inverse relationship with the relative order. The lower this value, the closer will be the node to the other nodes, and in other words, the node will be more accessible. On the other hand, if the differentiation of the spaces is higher, it will indicate more private condition of the spaces (Memarian, 2002: 7-35). The degree of integration of space is shown by the (i), which is inversely related to the relative asymmetry and actual relative asymmetry. The results of the hierarchical integration of spaces show the minimum to maximum integration (Ostwald 2011-a, 464). If the relative asymmetry is in the range of zero and one, the integration results start at 1.00 and have no upper limit (Ostwald, 2011-a: 453). The lower the depth of space, the greater will be the degree of integration in that space (Hillier, 1996: 25).

The concept of integration in architecture corresponds to variability in the flexibility and can be analyzed in terms of expandability and transformability in physical bodies with the possibility of spatial integration and differentiation. In other words, if a space in a spatial configuration is associated with its adjacent spaces in such a way that it is possible to directly connect that space to each other, and if not needed, each of them can regain its distinct and original nature, then an integrated is formed between them, which can provide the basis of flexibility for the building.

Thus, increasing the integration in one space indicates increasing the likelihood of communication between that space and other neighboring spaces. On the other hand, the spaces that form a spatial configuration loop have the capability to integrate in the required conditions and, if not needed, by blocking a part of these connections, they can be used in separate spaces for specific activities (Kiaei, Soltanzadeh, and Heidari, 2019: 67-66).

2.6. Control Value (CV)

The probability of selecting an axis or a node relative to its surroundings is called “control” (Masoudinejad, 2007: 13). If the space is directly related to “n” spaces, it can control each of them

with the rate of "1/n". The control for each space is equal to the sum of the control of the spaces associated with that space (Tabatabaei Malazi and Sabernejad, 2016: 80).

Control is a parameter that determines the degree of authority of a point from other points to which it is connected. In other words, with the lower the degree of selectivity relative to a particular point, the control over it will be less (Kamalipour, Memarian, Feizi and Mousavian, 2012: 4). The rate of control can define the relative strength of the axial line in the potential absorption of its neighborhood and is calculated by the following relation, where Val (b) is the number of connections to the point "b" (Ostwald, 2011-a: 455).

$$\mathbf{CV\,(a)} = \sum_{\mathbf{D\,(a,b)=1}} \frac{\mathbf{1}}{\mathbf{Val\,(b)}}$$

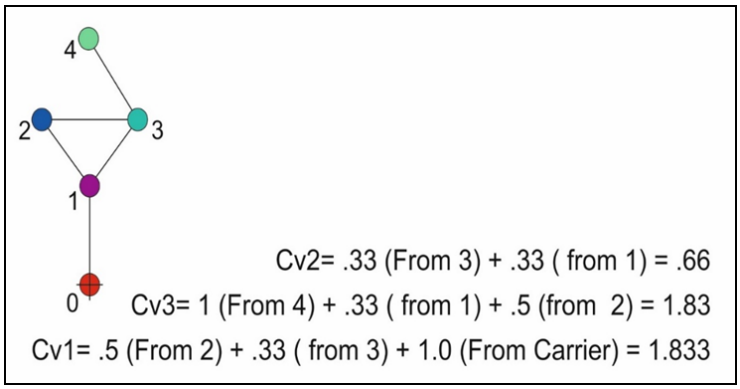


Fig 3 The graph and calculation of the control value (Author)

To calculate the CV of each node, the NCn of that node must first be obtained. NCn is the number of spaces that the node is associated with. Since CVe = 1 / NCn, the value of CVe is easily calculated for each node. Similarly, CV is the sum of CVe of nodes associated with the considered node (Ostwald, 2011-a: 456). Accordingly, there is more than one control value, and this refers to spaces that allow the required access (Shapiro, 2005: 52).

In other words, with the lower the degree of selection, the lower will be the degree of control over a given point. The adaptability index can be analyzed in the sense of control value.

3. Research Method

Data mining is the extraction of information and knowledge and the discovery of hidden patterns from a very large database. The use of data mining techniques in organizations results in a large number of laws and regulations that cannot be implemented due to limited resources and budgets.

In an informal definition, data mining is an automated process for extracting the patterns that represent knowledge, which is implicitly stored in huge databases, data store rooms and other large repositories (Ismaili, 2014: 26).

As a very influential component of urban communities and because of its wide dimensions, housing affects many other variables and is equally affected. One of the sources for recognizing the dimensions of this impact on architecture is the spatial data mining or spatial configuration (a set of relationships based on two or more features), which has direct relations to the existence and quality of each architectural work and forms a linking pattern between body and meaning.

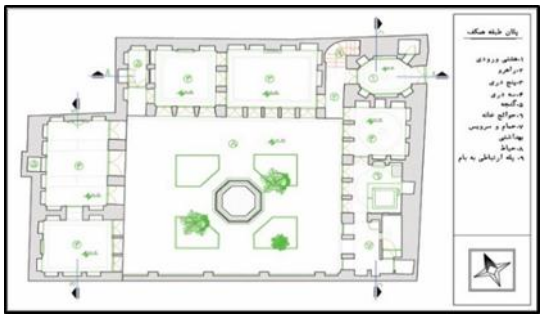
This role can be analyzed and evaluated in locating any space and its relation to other spaces to provide an approach to editing the today's architectural gene and to somehow modernize the native and original patterns of each culture and land, and maintain the architecture in the native conditions with the required adaptations to the environment.

The tool among the contemporary techniques that makes this data discovery is "Space Syntax", which can exhibit the hidden pattern of effect and relationship between the body and Exhibits socio-cultural behavior values such as the total depth, mean depth, integration, and control value, etc.

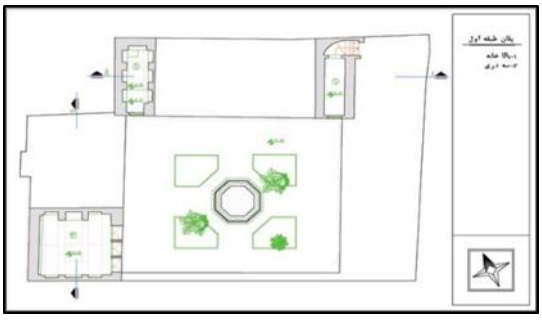
The House of Warriors (House of Jangjouyan) has been selected as a work of Esfahan's indigenous architecture in the Qajar era (as a period where the boundary between tradition and modernity in Iranian architecture was somehow the last era to embody the indigenous architectural values), which was once referred to as a model Indigenous housing and has nowadays been able to play a role in changing the way it has adapted to contemporary conditions with minimal changes.

3.1. House of Jangjouyan

House of Jangjouyan is located in District 3 of Esfahan, in Masjid Ali Lane, Haroonieh Street, next to Atiq Square, Ali Mosque, and Haroon Velayat Region, and is a late Qajar building. Its area is 350 square meters and its standing property is 240 square meters. The house consists of 22 convex spaces and has two floors in some parts (Maps 1 and 2). The building was renovated in 2009 and is currently being used as for residence (Emami, 2009: 22).



Map 1: 1st foor plan (Omran & Maskansazan "Civil & Housing Construction" Co.



Map 2: Ground floor plan (Omran & Maskansazan "Civil & Housing Construction" Co

4. Results

In order to analyze and evaluate the research findings, each node should be considered as a carrier node and a corresponding graph should be drawn. Then each data set is to be evaluated in the three modes of the lowest (maximum), highest (maximum) and average states.

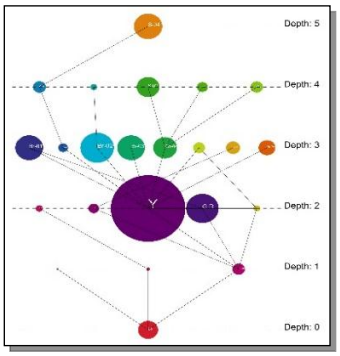


Fig 4 Spatial graph of the porch (Author)

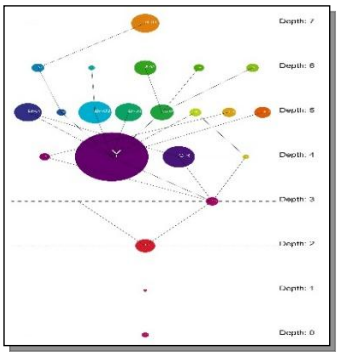


Fig 5 Spatial graph of the store room 1

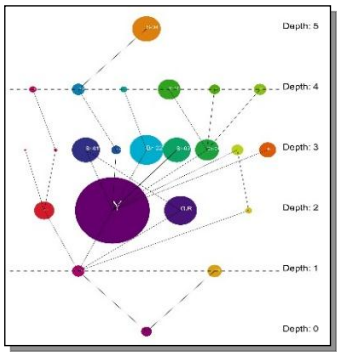


Fig 6 Spatial graph of the stairway

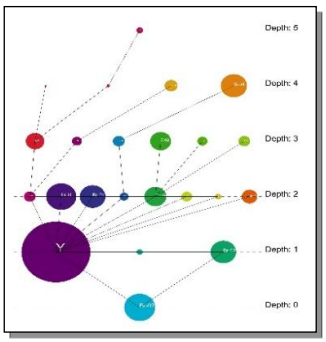


Fig 7 Spatial graph of the yard (Author)

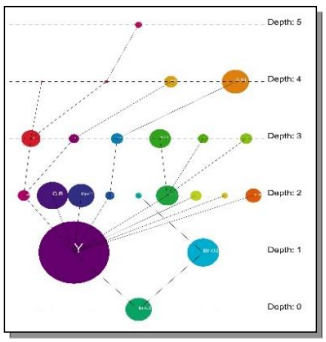


Fig 8 Spatial graph of the guest room (Author)

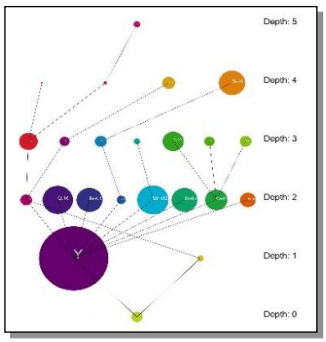


Fig 9 Spatial graph of the room 1 (Author)

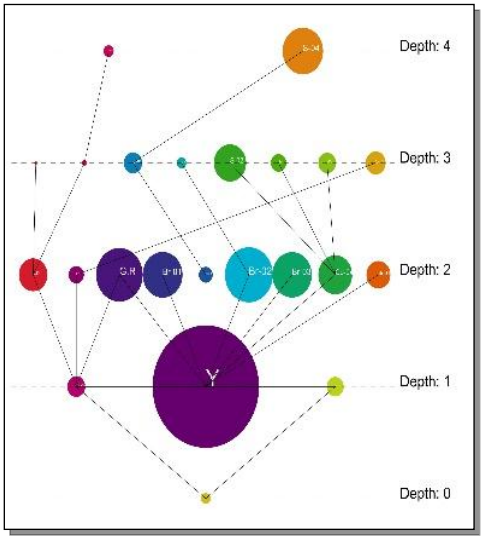


Fig 10 Spatial graph of room 2 (Author)

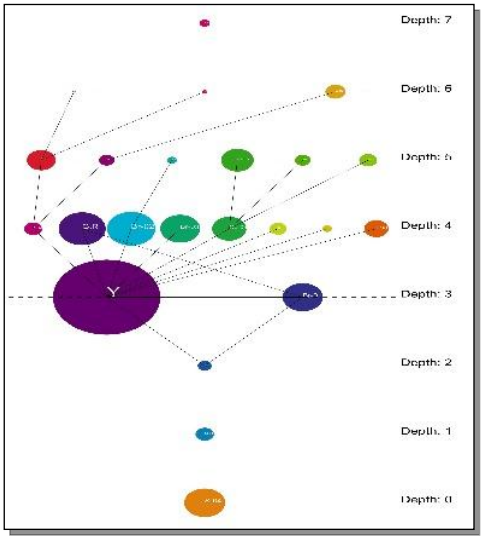


Fig 11 Spatial graph of room 3 (Author)

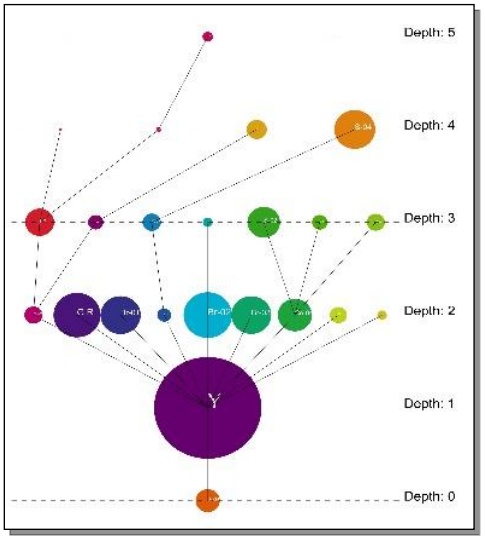


Fig 12 Spatial graph of kitchen (Author)

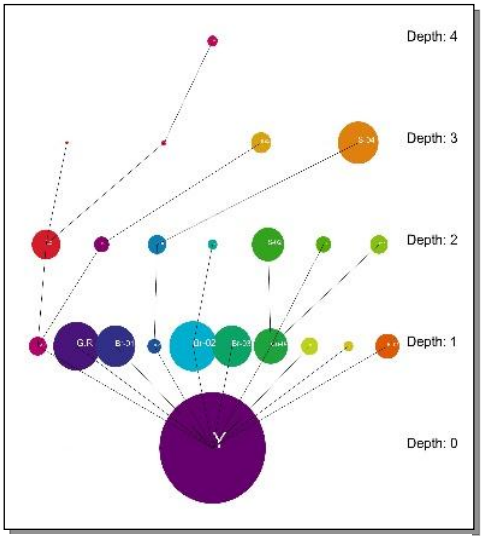


Fig 13 Spatial graph of the living room (Author)

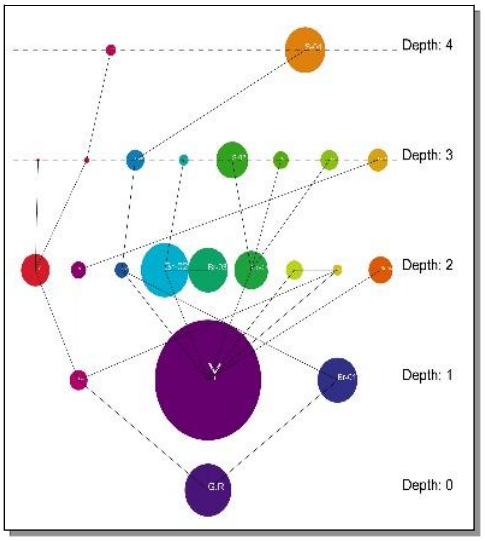


Fig 14 Spatial graph of store room 4 (Author)

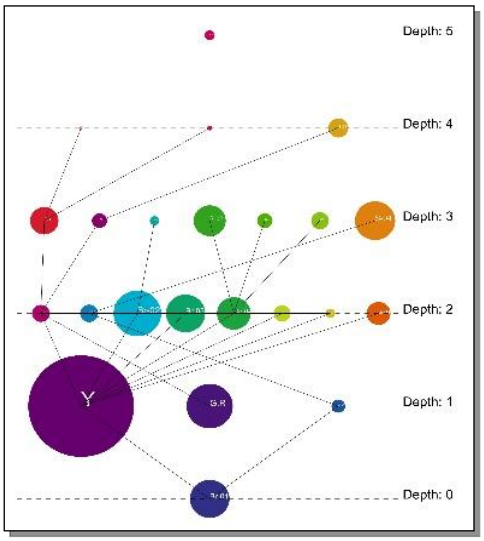


Fig 15 Spatial graph of room 4 (Author)

Table 1 No. of layers, total depth, mean depth, degree of integration and control value in the House of Jangjouyan (Author)

No.	Carrier Node	Control Value	Degree of Integration	Mean Depth	Total Depth	No. of Layers
00	Entrance	0.3	3.78	3.8	83	7
01	Porch	1.7	5.77	2.8	62	6
02	Corridor 1	1.3	3.91	3.7	81	7
03	Store room 1 (1st floor)	0.5	2.88	4.65	102	8
04	Corridor 2	1.6	9.24	2.15	47	5
05	Stairway	1.2	5.25	3	66	6
06	Courtyard	4.11	12.83	1.8	40	5
07	Guest room	0.6	7.45	2.4	53	5
08	Room 1	0.7	6.60	2.6	57	6
09	Corridor 3	0.9	6.79	2.55	56	6
10	Closet 1	1.3	4.35	3.4	75	6
11	Room 2	1.6	6.41	2.65	58	6
12	Closet 2	0.3	4.05	3.6	79	7
13	Room 3	0.4	6.24	2.7	59	6
14	Corridor 4 (1st floor)	3.1	7.00	2.5	55	6
15	Store room 2	0.25	4.27	3.45	76	7
16	Bathroom	0.25	4.27	3.45	76	7
17	Lavatory	0.25	4.27	3.45	76	7
18	Kitchen	0.4	6.07	2.7	60	6
19	Sitting room	0.8	7.45	2.4	53	5
20	Store room 3	0.5	3.55	3.95	87	7
21	Store room 4	0.5	3.12	4.4	96	8
22	Room 4 (1st floor)	0.1	5.92	2.8	61	6

Minimum	0.1	2.88	1.8	40	5
Average	0.98	5.71	3.08	67.73	6.34
Maximum	4.11	12.83	4.65	102	8

5. Discussion

According to the data in Table 1, it can be concluded that store room 1 with the total depth of 102 is the most private space and the yard with the total depth of 40 the most public space. It can also be stated that:

"Yard spaces, corridor 2, guest room, living room, corridor 4, corridor 3, room 1, room 2, room 3, kitchen, room 4, porch and stairway" with the mean depth less than 3.08 are more public areas than "store room 1, store room 4, store room 3, entrance, corridor 1, closet 2, store room 2, bathroom, lavatory and closet 1".

Accordingly, the yard with the lowest mean depth has the highest rate of entrance and the highest degree of flexibility. Thus, the degree of flexibility of each space is based on the degree of entrance and spatial depth, as shown in Table 2.

Table 2 Total depth and mean depth of the House of Jangjouyan (Author)

Bathroom	Store room 2	Closet 2	Corridor 1	Entrance	Store room 3	Store room 4	Store room 1	Space Title
3.45	3.45	3.6	3.7	3.8	3.95	4.4	4.65	Mean Depth
Room 3	Kitchen	Room 4	Porch	Stairway	Average	Closet 1	Lavatory	Space Title
2.7	2.7	2.8	2.8	3	3.08	3.4	3.45	Mean Depth
Courtyard	Corridor 2	Guest room	Sitting room	Corridor 4	Corridor 3	Room 1	Room 2	Space Title
1.8	2.15	2.4	2.4	2.5	2.55	2.6	2.6	Mean Depth

Store room 1 with the degree of integration of 2.88 is the most distant space and the courtyard with the degree of integration of 12.83 is the most integrated space with the most spatial consistency and integration with other spaces (Table 3). The degree of integration indicates the spatial variability and indicates flexibility.

Table 3 Degree of integration in the House of Jangjouyan (Author)

Bathroom	Store room 2	Closet 2	Corridor 1	Entrance	Store room 3	Store room 4	Store room 1	Space Title
4.27	4.27	4.05	3.91	3.78	3.55	3.12	2.88	Integration
Room 3	Kitchen	Room 4	Porch	Average	Stairway	Closet 1	Lavatory	Space Title
6.24	6.07	5.92	5.77	5.71	5.25	4.35	4.27	Integration
Courtyard	Corridor 2	Guest room	Sitting room	Corridor 4	Corridor 3	Room 1	Room 2	Space Title
12.83	9.24	7.45	7.45	7.00	6.79	6.60	6.41	Integration

Considerable point is the potential of the detection and precision of the software, which is introduced by comparing Tables 2 and 3 in exploring the space variability and the stairway space of lower than the mean range, as a space with lower flexibility, while other spaces are correspondingly in the tables.

From a spatial control point of view, the value of yard control (4.11) is highest and room 4 control value (0.1) is lowest on the first floor. The spatial control is another factor that shows the degree of control over each space and spatial adaptability and is in some way directly related to spatial flexibility and the functional efficiency of the space (Table 3).

The data in Table 3 indicate that the intermediate spaces such as yards, corridors, and the dividing areas (porch) play an important role in the spatial adaptability.

Table 4 The space control value in the House of Jangjouyan (Author)

Room 3	Kitchen	Entrance	Closet 2	Lavatory	Bathroom	Store room 2	Room 4	Space Title
0.4	0.4	0.3	0.3	0.25	0.25	0.25	0.1	Control Value
Average	Corridor 3	Sitting room	Room 1	Guest room	Store room 4	Store room 3	Store room 1	Space Title
0.98	0.9	0.8	0.7	0.6	0.5	0.5	0.5	Control Value
Courtyard	Corridor 4	Porch	Room 2	Corridor 2	Closet 1	Corridor 1	Stairway	Space Title
4.11	3.1	1.7	1.6	1.6	1.3	1.3	1.2	Control Value

6. Conclusion

After analyzing the concepts of the total depth, mean depth, degree of consistency and value of control in the House of Jangjouyan, as an example of Qajar native homes in Esfahan historical area, the results of the study indicate that native houses with the central courtyard, the placement of the yard in the middle layer has caused it to have a more considerable role in the organization and spatial configuration of the house. Other spaces around the yard and defining its accessibility from the middle and intermediate layers make each space have a defined territory and boundaries; on the one hand, internal relationship has provided the conditions for the spatial integration. This pattern can provide a manifestation of variability and adaptability in a structure.

On the other hand, the number of the existing uses in the physical home system and having similar spatial value imply the concept of diversity as another indicator of flexibility, which is the keyword in the spatial flexibility and hence the spatial efficiency; a space, such as a room in a spatial configuration, having the same value as other spaces, can adapt itself to other uses, including the bedroom, living room, or a guest room, in order to serve as a specific room. However, it is not possible in the contemporary space system to use the spaces such as the sleeping room to be replaced with other type of spaces. It is to note that the main share of diversity and adaptability of the spatial body of a native home is related to the presence of the climatic spaces for summer and winter.

The results of the space syntax analysis show that the yard is the mostly used space with the highest capability to create spatial consistency and the highest degree of control over other spaces. The storage room and the room in the first floor have different conditions with the least flexibility.

Overall, the placement of the courtyard in the middle layers has caused it to play a significant role in the spatial configuration, whereas in contemporary homes, the placement of the courtyard in the primary layers has diminished its importance and this role has been given to other spaces.

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Place as an Output of Codes: Importance of Being Place-Character Base of Form-Based Codes

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Abstract

The primary question is the product of form-based codes different in terms place-character? A secondary question that follows is if this lack of differentiation based on place-character is a result of the code itself or of issues peripheral to the code. Each place represent a customized interaction between a 'code' (conceptual framework) and a 'place' (contextual framework) which could be described as a 'narrative'. Individually dissecting these narratives along specific cross-sections, such as location, chronology, typology, scale, and fit, could reveal patterns of similarities and differences. Research shows that each of these cross-sections impact specific aspects of place-character and place-making. Qualitative correlations across codes and cross-sections, could explain certain patterns observed in the codes along specific cross-sections. It is concluded that the process of place-making could be lost in the melee. While form-based codes appear to be extremely flexible, this complex condition could prove burdensome for any code or regulation without compromising its place-making potential. Factors in shaping the output of form-based codes are place, process and the policy framework. In establishing responsiveness to context, the negotiation is between traditions and aspirations, which could be divergent concepts. Yet there is always a paradigm that successfully mediates this condition. Form-based codes present a simple response to a complex set of urban issues, it is important to maintain place-specific context around the application of this approach. Another consideration in this mediation could be eliminating zoning but it is never possible to replace a system of rules with the absence of rules.

Keywords: Form-Based Code; Place-Making; Place-Character Features; Coding

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1. Introduction

Zoning can be defined as dividing the urban space to some blocks and regulating the related rules for each of them. Zoning is considered a planning instrument used for controlling land use, its dimensions, type and the location of the structure (Hodge, 2003). Its key concepts are land use, density, volume, division features and other rules (Leung, 2003). The zoning regulation approach was further developed by the German engineers Reinhard Baumeister and Franz Adicks at a meeting of the German Architectural and Engineering Societies in 1874 (Ben-Joseph, 2005). The first of these divisions was done by local rules in Germany and Holland at the end of 19th century to separate heavy industries from historical and residential sections. The first works on density and limiting the height of buildings in America for providing the light, air circulation and controlling the traffic volume was enacted at the beginning of the 20th century (Burdette, 2004). In Baumeister's book, Town expansions considered with respect to technology, Building code, and Economy (1876), the regulation approach was called as zoning and the origin was traced by the regulations in the 19th century France. He created two zones for the city and the suburb and then specified building bulk regulations for building height, setbacks, and the plot area, which influenced German cities in 1890s. Later the German zoning approach influenced in the 1909 Town Planning Act and the Garden City movement in Britain (Baumeister, 1874).

Zoning dates back to industrial revolution and its effects on controlling and targeting urban development. Among the effects was the rush of industrialized workshops to old urban textures and changed the valuable social body to an inefficient and insecure mass (Tayyebi, 2006). Modernist city design was begun to create a collective society where everyone would have housing for the minimum standards for sanitation, light, and air (Barnett, 2011). Most of the old urban areas were reshaped to eliminate slums and factories from communities. During this time, the codes were adopted to cope with the early urbanization and zoning was designed to protect existing neighborhood from inappropriate developments in the early 20th century. Zoning was considered as a primitive system that could keep residences away from the noisy and dirty factories and could protect neighborhoods from tall buildings.

Various theories of urban planning and design have influenced zoning approaches. Most zoning regulations changed built environment and the undesirable impact of the zoning regulations were immediately visible (Talen, 2012). Among numerous zoning types, the representative and distinctive zoning approaches are Euclidean, Performance, Incentive, and Form-based (Barnett, 2011). FBC places higher priority in controlling urban form such as the typology of block, street, open space, and building envelope (Ben-Joseph, 2005; Parolek, et al, 2008).

FBC is a zoning regulation approach that aims to achieve a specific urban form rather than building functions and bulks. U.S. Environmental Protection Agency (EPA) defined form-based codes as a type of zoning codes that outlines specific urban form rather than zoning. EPA differentiated FBC with design guidelines and design standards in view of significant enforceability. Talen (2009) explained that FBC is a linage of zoning codes rather than design guidelines or standards. She defined the attributes of FBC as significant enforceability, the prescriptive regulations, and the production of urban form of urbanism.

1.1. Literature Review

The criticism on function zoning among which the most important cases are spreading and reduction of human life environment ignited new approaches which prepared the conditions for main changes in urban development and improvement of the status quo. The awareness of the

results of modernism on city space and removing the four directions made the postmodern movement to suggest a part to part design of urban texture and employing the past forms, more taxes and reinvestments through new uses (Ashrafi, 2009).

1.2. Euclidean Zoning

Euclidean zoning was approved in 1926 in Ohio State of America in Euclid town through verification of uses separation. After that, it was used in many societies as a regulating tool for urban activities (Aliakbari and Qahremani, 2012), spurred by the need to separate incompatible building uses to prevent the spreading of fires and to provide light and air in buildings. Eventually, the separation of incompatible uses led to segregation of uses and the creation of separate residential, commercial, and industrial "zones" within the city. Residential uses were further separated into multi-family and single-family zones, motivated by the perception that multi-family buildings were both substandard and housing for "undesirables". In 1926 this stereotype was reinforced through the court case of Village of Euclid vs. Ambler Realty Company that validated the constitutionality of comprehensive zoning, which is now called “Euclidean Zoning” (Burdette, 2004).

1.3. Conventional Zoning Influence

Unfortunately, conventional zoning, as enabled by the Standard Zoning Enabling Act, does not address the needs of physical design beyond rudimentary dimensional requirements, which weakens the poor connection between land-use regulation systems and physical design (Ben-Joseph, 2005). Zoning, basically, segregates uses (use-based zones with prohibited uses), controls land development intensity (minimum lot sizes, number of units per acre, floor-area ratios, and parking requirements, and manages building bulk (building setbacks, lot coverage, and building height). Typically, these standards are applied uniformly for a particular zone with no consideration for the location of a parcel within a zone. Over time, conventional zoning has become scapegoat for sprawl (low density, single use developments with poor accessibility) as well as social and economic exclusionary land development practices. (Ben-Joseph, 2005) Performance zoning regulates land developments for environmental protection by using performance standards on traffic flow, density, noise, air, light, etc. It is also called as Effective-based zoning. In this zoning, grading systems often administrate land development. Under the performance compliance, any building forms can be built, which allows a level of flexibility in design and administration (Ben-Joseph, 2005). However, it has not been widely adopted in the United States compared to Euclidean zoning, while it is used in hybrid approach by combing it with Euclidean zoning (Barnett, 2011).

1.4. Question of Research

The primary question of this research is the output of form-based codes differentiable in terms of place-character? This question requires defining the “output of form-based codes”. The output of form-based codes, under the circumstances, is the place as illustrated by the codes and related documents. The essential premise of this research is as follows: While form-based codes could certainly result in quality urban places, the essential character of these places, the 'spirit of place', could be singular and indistinguishable from place to place. In order to answer this question, certain terms of reference, such as 'place' and 'placelessness', require clarification. A 'place' is a 'space' that has a distinct character, whereas space denotes the three dimensional organization of the elements which make up place, 'character' denotes the general atmosphere which is the most comprehensive

property of any place. In the true sense of the world, spaces where life occurs are places (Schulz, 1980). In that sense, 'place-character' refers to certain qualities based on physical location, and other perceptual qualities based on life in spaces. 'Placelessness' refers not only to the lack of place-character but also to a lack of differentiation between places based on locational distinction. Therefore, it follows that 'place-making' is not limited to the physical design of spaces but includes all the events and activities that occur in the space. With this concept comes the notion of urban design as the design and management of the 'public realm'- defined as the public face of buildings, the spaces between frontages, the activities taking place in and between these spaces, and the managing of these activities, all of which are affected by the uses of the buildings themselves, i.e. the 'private realm' (Carmona et al., 2010). A secondary question that follows is if this lack of differentiation based on place-character is a result of the code itself or of issues peripheral to the code, i.e. the place itself, the people involved, or the policy framework.

2. Research Method

Places that the codes represent are the output of form-based codes, and hold clues about the intended 'sprit of place' (Schulz, 1980). Each place represents a customized interaction between a 'code' (conceptual framework) and a 'place' (contextual framework) which could be described as a 'narrative'. Individually dissecting these narratives along specific cross-sections, such as geography/location, chronology, typology, scale/structure, and fit, could reveal patterns of similarities and differences. Each of these cross-sections impact specific aspects of place-character and place-making. In addition, qualitative correlations across codes and cross-sections, could explain certain patterns observed in the codes along specific cross-sections. This process of layering information and inferences from codes across different cross-sections illustrates the complexity of place-making and demonstrates the flexibility of form-based codes.

2.1. Conceptual Framework: Codes, Generator of Places

a) The Definition and Characteristics of Form-Based Codes

Simultaneously as there was an attempt to streamline conventional zoning, the charter of the new Urbanism collaborated and worked as individual practitioners on a new zoning approach. Some of the first attempts at this new approach were spearheaded by architecture and planning firm, Duany Plater-Zyberk (DPZ) in 1981 through the development of code for seaside, Florida. Conditions were favorable (no zoning ordinance) making it possible to plan freely with the absence of regulations, and design a mixed-use development with densities greater than conventional suburban development. The plan for seaside regulated development with a catalog of building types that were tied to specific lots on the plan, which could be represented graphically. Although many have criticized seaside's architectural standards as overly stringent and lacking diverse character, seaside inspired more cities to adopt form-based codes and has had a profound impact on urban planning and new Urbanism (Madden and Spikowski, 2006: 176).

b) Design-Based Planning

This approach tries to make a balance between urban planning systems and urban design and criticizes the separate linear model between these two factors. Design-based planning which consider the cities as a whole, doesn’t want to provide a response to appropriate traditional urban development plans and qualitative issue in cities (Abbaszadegan and Razavi, 2006: 15). As far as the traditional zoning system based on construction rights in pieces has a similar treatment with

land pieces and similar use classification and ignore to consider the differences in opportunities or limitations of each piece, it can't act successfully (Pamir, 2010).

- The principles of design-based planning include:
- Grounding on functional goals
- Flexibility of rules and regulations
- Understanding the importance of general areas and their relationship
- Noticing to density, functional mixing and architecture
- The importance of quality and form (Rafieian and Razavi, 2010: 271).

c) The Smart-Code

To be implemented in urban environments, smart codes need an integrated system of regional weighting from dispersed country areas to condensed urban centers called Transect Map (Tayyebi, 2006). The next formal iteration of a form-based code following seaside was the Smart-Code, a model form-based code written by DPZ. The code is a basic recipe for walkable, mixed-use neighborhoods and downtowns, of which character, density, and use are finely tailored or calibrated by the community.

The Smart-Code is based on an explicit, normative theory, known as the Transect that links human and natural environments in one continuous systems and promotes an urban pattern that is sustainable, coherent in design, and composed of an array of livable, humane environments. More simply, the transect works by allocating elements that make up the human habitat to appropriate geographic locations (Duany and Talen, 2001).

d) Form-Based Codes

Form-based zoning came into being at a time when the disenchantment with conventional zoning practices was high and the place-making tradition of urban design was gaining recognition. These codes originated with the new Urbanism movement, which posited specific place-making ideas about the design of neighborhoods, such as mixed uses, walkability, legibility, hierarchy in building and street types, and environmental sensitivity, as a cure for issues related to sprawl. The proponents of new Urbanism claim that true urbanism is diverse, compact, pedestrian and celebratory of the public realm. Conventional zoning gives us only a disaggregated version of urbanism, commonly known as sprawl, which doesn't constitute a viable human habitat (Duany and Talen, 2001).

Talen describes the similarities and differences between conventional zoning and form-base codes. In terms of the public realm, safety, aesthetics, order, and uniformity, both conventional zoning and form-based codes have pursued the ideal configuration of urban form, but form-based codes have many more regulations and standards than conventional zoning that directly affect urban form and the physical environment (Talen, 2009: 156-157).

Table 1 Comparison between Conventional zoning and Form-Based Codes

Conventional Zoning	Form-Based Codes
Often applied universally throughout a jurisdiction	Created for a specific planning area
Reactive, focusing on preventing bad things from happening	Purposeful, pro-active, and focused on implementation of community planning goals and objectives
Focus on land use	Connects urban form and land use
Development standards inadvertently or intentionally	Primary focus is on achieving compact, mixed-use,

discourage compact, mixed-use, and pedestrian-friendly development	and pedestrian-friendly development
Text-based presentation	Liberal use of graphics to define key concepts and requirements

Source: Author, 2014 (based on Talen, 2012)

e) Definition of Form-Based Code

The term form-based code was first used by Carol Wyant, former director of the Form-Based Code Institute (FBCI), as the proposed title of a 2001 presentation to the Chicago Zoning Reform Board (CZRB) by a New Urbanist team of architects. As its name suggests, form-based coding seeks to regulate the form of the built environment. The new approach builds on the idea that physical form is a community's most intrinsic and enduring characteristic. It seeks to codify that form in a straightforward way so that planners, citizens, developers, and other stakeholders can move easily from a shared physical vision of a place to its built reality (Katz, 2004).

f) Importance of Form-Based Codes

Design is more important than use' embodies the underlying philosophy behind the Form-Based Code. Form-Based Codes represent multi-disciplinary codes that connect the design of circulation and public space networks to the design of building form. A community's physical form -- namely, its buildings, streets, and public spaces-- signifies it's most defining characteristic as they shape the public realm. Asserting more control over a community's form could lead to improvements in the way the community functions. This increased control includes the fostering of pedestrian friendly mixed-use developments, and a range of housing types (Burdette, 2004). Katz listed eight advantages of form-based code. They: (1) state what is possible and are prescriptive; (2) encourage public participation; (3) encourage independent development; (4) reflect a diversity of architecture; (5) codify neighborhoods DNA; (6) are easier to understand for non-professionals; (7) obviate the need for design guidelines and (8) may be more enforceable than design guidelines (Cullingworth et al., 2013).

Form-based codes are mix of elements that require place-based definition and other elements that are generalized across different places. Architectural standards, more so than regulating plans or urban standards, are place-neutral, i.e. the issue of aesthetics is more subjective and open to interpretation than classification of street types or building frontage types. Although, it is important to recognize each of these representations of place-character through standards relative to the place-character inherent in the existing context. Therefore, in a place defined by its architectural style, the dominance of architectural standards is unavoidable. The product of form-based codes represents a specific interaction between a conceptual framework represented by the code and a contextual framework represented by the place. The following chapter follows the 'terrain' of a representative sample of form-based codes in order to understand this interaction based on specific cross-sections through the codes.

2.2. Contextual Framework: Place as a Product of Codes

- Two Protocols

The two protocols (surveys and case studies) are significant elements of this research. Form-based codes have two protocols; one as planning instrument and other as regulatory instrument. The representation is a collective vision for the place and that the code is insurance for faithful implementation. As the scale of the code gets larger from neighborhood scale to city or regional scale, the abstraction in representation goes higher as well.

2.3. Interaction Between Codes and Place

a) Geography

Geography refers to the physical location of the product in terms of state boundaries. The codes differ in structure, scale, typology, and fit within the existing policy framework. While this is illustrative of the flexibility of form-based codes to adjust to different contexts, the lack of similarity due to geographical affinity, especially in addressing place-specific issues, could be of concern. A coordinated approach could be valuable between cities, counties and metropolitan regions, especially on issues like transit oriented development or smart growth.

Another issue related to geography is stylistic. Considering the variety in regions represented in the case studies, the overall preference for a neo-traditional or revivalist aesthetic could be a concern. While some codes referenced specific regional styles, including historical and vernacular stylistic references.

b) Chronology

Chronology refers to the year that the code was adopted or legislated by the city, county or municipality. There is certainly evidence of clarification and correction over time, which is expected. As more form-based codes are written, there is a larger knowledge base and expertise in the field. Limited experience with implementation is a consequence of this relatively short time frame, but this issue will recede as more codes begin implementation. However, it is possible that examples of failed implementation could discourage cities and counties from adopting form-based codes. It is important to note that failed implementation is not necessarily a consequence of shortcoming in the code but a sum total of the social, economic, and political context of the application (Gosling and Gosling, 2003).

c) Scale and Structure

Scale and structure are essentially correlated cross-sections. Scale refers mostly to the physical scope of the project (neighborhood/community, district, city, or regional) but at times could reference a perceptual or identifiable scale, especially in the description of community scale plans. Structure (form-based, neighborhood/corridor/district) is a translation of scale into the organization of the code, which is almost always adjusted along a continuum based on context of the codes. Intent is an interpretive cross-section, which classifies the place-making intention (shape place or preserve place) of the code. Consequently, scale determines the structure of form-based codes. But the basic unit of design continues to be community or neighborhood, which substantially influences sense of place by aligning sense of community and sense of place. The community/neighborhood scale plans are structured as basic form based codes with regulating plan(s), building envelope standards, streetscape/thoroughfare standards, and architectural standards, allowing for minor diversions to accommodate existing conditions.

d) Typology

Typology refers to the dominant character of the urban intervention (transit oriented development, traditional neighborhood development, urban revitalization, and regional plan) and is a discrete value. Most of the case studies are easily classified as urban typologies, i.e. the motivation for undertaking a code project and the representation of place in terms of character is recognizable as a specific type of urban intervention. It is important to note that typologies are not scalar values, although certain scalar associations may be evident in the case studies. Each of urban intervention typologies is associated with specific place characteristics, which in conjunction with other contextual constraints, such as scale and structure - as a consequence of scale- constitute 'sense of place'. But it is important to note that 'sense of place' is more than a physical construct.

e) Fit

Fit is the placement of the form-based code within the legislative framework of the city, county or municipality. Fit is usually a direct consequence of scale. Form-based zoning, as an instrument, displays the required flexibility to absorb this multiplicity of characters. In order to capture both a typological intent and sense of place, the proposed 'vision' requires careful calibration and meticulous translation into intent. More importantly, form is only one aspect of place-making. The significance of the physicality of places is often overstated: (patterns of) activities and (layers of) meanings may be as, or more, important in creating sense of place (Carmona et al, 2010). Places are made vital by the people that inhabit these places, by the processes that constantly change places and allow people to participate in the making of the physical environment, and by the policies that create the framework for this civic act. Form-based codes are a single cog in the wheel, but an essential ingredient for place-making. These codes do not exist in a contextual vacuum and are shaped in many ways by the vagaries of place, the quirks of the process, the actions of people (the community, public officials and consultants) and the limitations of the policy framework.

2.4. Surrounding of Form-Based Codes

a) Form

In urban planning literature, the word "form" is a synonym of city physique. Queen Lynch defined the form as "physical and visible manifestation". Some of the scholars considered the physique of city as synonymous with artificial and inanimate elements. The form of the city includes the special distribution of individuals and activities and spatial and physical movement of individuals, goods, and information in space, those physical features making considerable change in the space, periodical changes and the periods resulted in spatial distribution on space controlling and its understanding (Tayyebi, 2006).

b) Holism and a Single Wholeness in Urban Form

In holistic approach, the understanding faces with the general whole not its parts and a phenomenon understood by its relation with other phenomenon. The features of a whole can't be specified through the elements making it especially when the elements are studies separately or in a simple relation with other parts (Stokols and Altman, 1987). If everything is limited to its elements, this cutback makes a gap in our understanding. So, the elements follow from the relations and goals which dominate the whole (Ash, 1987). Alexander represented seven performable rules in his book on new urban planning and showed how a whole can be made up of urban space. The rules are 1- gradual growth, 2- growth of bigger wholes, 3- contemplation and vision, 4- positive basic principle of urban space, 5- arrangement of big building, 6- building, 7- formation of the centers (Mohajeri and Qomi, 2008: 50).

c) Reaching an Integrated Coherent Structure

The word coherence has been defined as "becoming a part of something" and "determining the wholeness of something" (Bateni, 2007). According to view of sociologists, coherence can be defined as the organizing process of spatial order connecting separate spatial units together (Chalabi, 1995). In urban development process, a new model is made through increase of new elements affecting the form of other components. It can make coherence or destroy it.

Alexander put considerable emphasis on interactive effect of people and environment on each other. He represented many patterns through which people can make an unlimited variety for buildings, cities, new urban space and physical environments. He presented 253 patterns divided to three main groups: cities, buildings, and structures.

The language of the model considers the following purposes:

1. A way for understanding and controlling complicated systems

2. Using the language of the model as an instrument for reaching structural and functional coherence (Mohajeri and Qomi, 2008: 51).

According to Mumford (1949), the concept of structure-based urbanization is accompanied with excessive wholeness and coherence where everything is formed based on general goals and is in contrast with simple personal benefits. Structure-based urbanization needs time and can't be applied for all generations. Mumford emphasized that structure-based urbanization, unlike its adventitiousness, sometimes lead to a coherent and integrated plan and makes a plan which seems to be guided by an ingenious theory (Mumford, 1949).

Alexander (2004) introduced 15 irrefrangible principles of matter and awareness which lead to the formation of a single and integrated generality. In his view, two orders are influential in making physical space including spatial functional order and form-based order. These two orders connect the plan to nature and human emotions which is called wholeness. In a good designing, wholeness is seen in all elements of a structure. The functional and form-based order can be effective in reaching the live quality factor in physical environment (Mohajeri and Qomi, 2008: 52).

d) The Effect of Classical Zoning on Urban Forms

A city is a plan and a mass of buildings, constructed and non-constructed private and public spaces. The third dimension which is size and architecture is so important that Bruno Zevi used "Urbatecture" for determining its analysis (Ashrafi, 2009: 155). Mainly, the focus is on the method of determining land use, representation of capita tables and physical regulations. One of the main problems of comprehensive/comparative model is the separation and deep problems between two main elements of urbanization which are urban planning and urban designing which is reflected brilliantly in Iranian urbanization trends. In fact, one of the most important factors of unsuccessfulness of comprehensive traditional plans in Iran and world is the overemphasis on functional and physical duties and ignoring social, cultural and aesthetic dimensions of urban environment (Pirzadeh, 2008: 89).

3. Result and Discussion

Form-based codes exist within the constraints of a context, which includes place, process, people, and policy. Addressing place requires a fine-grained approach. Communities demand increasing value while maintaining status quo. Community participation could result in an unpredictable output, yet administrators and policy makers require predictability. Code facilitators are promoting an ideology in an extremely rigid policy framework. The process of place-making could be lost in the melee. While form-based codes appear to be extremely flexible and reflexive, this complex condition could prove burdensome for any code or regulatory instrument without compromising its place-making potential.

3.1. Factors in Shaping the Output of Form-Based Codes

Factors in shaping the output of form-based codes are: (1) the place itself, (2) the process (including the participants i.e. the community, policy-makers and professional facilitators), (3) the policy framework. These are factors that shape the stated intent of the codes and direct development in a specific direction through the prescribed code.

a) Place

Form-based codes, in terms of product, focus on formal aspects of the built environment, i.e. function follows form (Kohr, 2004). The built environment can be measured on multiple dimensions. Broadly these measures represent the intersection of physical form, function/activity,

and perception and include several aspects of the built environment such as character, continuity, quality, accessibility, legibility, adaptability and diversity (Carmona et al, 2010). It includes the way places work, as well as how they look. It concerns the connections between people and places, movement and urban form, nature and built fabric, and the processes for ensuring successful villages, towns and cities (Carmona et al, 2010).

Another issue related to sense of place is the lack of it, i.e. placelessness. In the specific case of American urbanism, many years of uncontrolled growth have resulted in dysfunctional urban/suburban landscapes with little place-character; morphologically, perceptually, socially or visually. Under the circumstances, the place itself becomes an impediment to responsive place-making and 'form follows function' (Ellin, 2007) appears to be an acceptable axiom.

b) Process and People

The process of generating form-based codes involves civic participation, which includes the community, policy-makers and professional facilitators. At present, tremendous value is associated with inclusive processes, especially in long term planning and regulatory propositions, but participatory processes could also be abused in the service of preserving neighborhood and business property values (Ellin, 2007).

Form-based codes could be classified into two categories; 'shaping place' (facilitating desired place characteristics) and 'preserving place' (protecting and preserving existing place characteristics). In both cases the community and policy-makers are involved in the process of underwriting property values through their implicit association with specific best practices in urbanism, i.e. form follows finance (Ellin, 2007). Homes in new Urbanist neighborhoods command an aggregate premium. Most of the premium stems from increased internal connectivity and decreased external connectivity and more than compensates for the severe trice discount associated with increased density and mixed land-uses (Song and Knaap, 2003).

c) Policy

A final consideration in this discussion is the policy framework within which form-based codes are located and how this framework could limit the place-making potential of the codes and vice-versa. The objective of this discourse is not to compare form-based codes to conventional zoning but to extend the understanding of form-based codes as a regulatory instrument.

- ***Hierarchical Structure***

Any place, community or city, is located within a policy framework, a hierarchical structure for decision making. Generally, this would include federal, state and local (city/town) levels, and an intermediate (metropolitan/regional) level for agglomerations around major cities. While certain developmental sectors, such as transportation, are planned at the state level, the state mostly establishes legislative requirements to guide development at the local or regional level.

- ***Implications of Smart Code***

Since form-based codes focus on physical form, these codes are more akin to urban design guidelines, which are meant as specific 'prescriptions' for the built environment. As policy, form-based codes are attempting to step away from the performance-based aspects of zoning but getting mired in limitations of a prescribed vocabulary and lack of flexibility to innovatively interpret this vocabulary.

- ***The role of architecture***

Compared to urban standards and land use policies, architectural standards are favored in terms of use and implementation (Sohmer and Lang, 2000). While form-based codes allow architectural standards as an optional element of the code, most cases studied opted to include architectural standards in order to capture visibility and ease of implementation.

4. Conclusion

In establishing responsiveness to context, the negotiation is between traditions and aspirations, which could be divergent concepts. Yet there is almost always a paradigm that successfully mediates this condition. It is critical not to create more homogenization in the way we are doing what we are doing (Polyzoides et al., 2002). While form-based codes present a simple response to a complex set of urban issues, it is important to maintain place-specific context around the application of this approach. Another consideration in this mediation could be eliminating zoning but it is never possible to replace a system of rules with the absence of rules. Under the circumstances, form-based zoning presents an alternative, which is responsive and capable of producing the desired results conditional to proper calibration of the code itself and clarification of processes proceeding as well as following the code.

4.1. Product and Place

The central question of this research about form-based codes is about the spirit of place (Schulz, 1980). This terminology espouses perceptual qualities (spirit) in location-specific physical space (place) and frames the working definition of 'place-character'. While form-based codes, as a product, prove to be extremely reflexive to contextual differences, the places imagined as a product of the codes represent a narrow intentional range in terms of place-character. It is possible that form-based codes promote uniform development not unlike the product of conventional zoning, albeit of higher quality.

4.2. Unintended Consequence of Predictability

While the highly prescriptive nature of form-based codes ensures consistent quality in the resulting development, this prescription also imposes a specific format or regime on the character of the resulting place. The application of form-based codes as an implementation vehicle for the desired outcome in terms of place elevates the persistence of this prescription. Predictability of outcome is critical, but could result in homogeneity of place as an unintended consequence. In order to ensure diversity in place character, this prescription requires adjustment based on the context of the form-based code application. Genetic structure of form-based codes is not lacking in capability or flexibility to adapt to place-based application.

4.3. From Shaping to Preserving Place

Initial applications of form-based codes were limited to create new communities in green-field developments (shape place). Over time, the potential inherent within the structure of the codes to address issues endemic to existing urban places (preserve place), including infill and preservation, was exploited.

4.4. Limited Narrative about Place

The present range of applications covers both ends of the spectrum. However, the implicit character of these places, as represented by the codes, continues to reference a limited narrative. While this narrative of walkability, mixed uses, and sociability under the rubric of sustainability and livability is current to urbanism, its problem solving potential is far from validated. Application of this essentially generic and transferable narrative across different locations and contexts without

place-based calibration results in places that lack differentiation in terms of place character. Thus, form-based codes become the vehicle for the propagation of this specific agenda regarding urbanism.

4.5. Impact of Place, Process, People and Policy

It is possible that this much favored approach is being underwritten by conditions peripheral to form-based codes, i.e. the vagaries of place, the quirks in the process, the actions of people and the limitations of policy. This is an important reminder of the fact that places are not limited to forms and physical qualities. Physical form is only a vessel for social, economic, cultural, and political processes that define places and give them character. While form-based codes and codes/regulations in general, lack the capabilities to directly address issues beyond physical form, the unintended consequences of these processes play a role in directing the intent of the codes.

4.6. Codes as Information

Suggestions such as local self-determination and design management imply reduced dependence on codes and standards as a regulation tool and increased reliance on codes and standards as an information tool. Regulation offers certainty – something must happen - whereas information only provides a suggestion of what could or should happen. This duality of purpose is inherent in form-based codes, which are tools for implementation as well as illustrations of ideas about place. The potential of place-making contained in this combination is severely limited by the dominance of regulation over information.

4.7. Place-Based Codes

The association of these codes with a specific trend in urbanism, i.e. neo-traditional urbanism or new Urbanism, redirects the resulting product towards a singular narrative. As noted earlier in the thesis, this association is not automatic and form-based codes could be proposed for alternative narratives and urban conditions. Possibly, what is needed is more typological consistency, which, in turn, will bring more architectural consistency (Kelbaugh, 2008).

4.8. Scale of Application

While the unit of design for form-based codes is the neighborhood, the resulting development and its connections to the larger planning and design context are shaped at the city, metropolitan or regional scale. In order to capture place character, a code project, at community scale or district scale, should be approached as a city scale or regional scale code. This vastly expands the vocabulary of the code and allows for diversity of urban narratives. The codes, in this case, facilitate the continuity between the local and universal.

4.9. Establishing Local Suitability Criteria

The diversity of code titles illustrates this reflexive quality of form-based codes. Yet, the negotiation between code and context is susceptible to peripheral issues like place, people, process, and policy. While most codes describe procedures for code administration and implementation as a means to clarify future negotiations, few codes address this issue preceding the code. Clarifying procedures related to understanding place and sensing place character could enhance the

responsiveness of the form-based code by establishing local suitability criteria for testing the standards.

4.10. Measuring 'Good City Form'

It is also critical to test the realized product of these codes against established paradigms for "goodness". Essentially, built environments could be measured in terms of form, activity, and meaning. Lynch's criteria for measuring good city form - Vitality, Sense, Fit, Access and Control (Lynch, 1984) - could be evaluated through place-based testing of specific qualitative inputs, such as morphology - land uses, street and public space networks, plot patterns, and building types-, perception - identity, structure, and meaning, visual - aesthetics and kinesthetic- , functional - uses, environmental response, and economics-, temporal-time and change management- , and social-diversity and equity- (Carmona et al, 2010). The key is in recognizing the diversity of narratives embedded in places and adjusting the inputs to achieve a reflexive output.

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Design of Fabric Accessories for Beauty Parlor

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Abstract

Beauty parlor and hairdressing tools are one of the things that fabric designers have paid less attention to it. The design of fabric packages for beauty parlor has been considered in form and color as well as hygienically in this thesis. This thesis has attempted to present and design hairdresser packaging from two perspectives, namely the principle of design as well as the use of antibacterial property, and has provided numerous examples of this fabric. In this thesis, silver and copper nano-particles have been used to complement hairdressing packaging to improve consumer health. On the other hand, color science and design principles were also used to improve the mental health of consumers, and eventually packages with such properties were designed. The offered textile packs contain nano-materials that create antibacterial properties when contacted with hairdressers and on the other hand, we have tried to play an important role in this design by applying the principles and rules of design and using the concept of hairdressing tools and accessories.

Keywords: Fabric Design; Packaging; Antibacterial; Copper; Silver

1. Introduction

Woven fabrics consist of twisting and at least two strands of perpendicular yarn that woven to each other. The yarns that are along the length of the fabric are called warps and the yarns are in the width of the fabric are called woofs (Khalil Khairi, 2002). To weave the fabrics, warps divide into two categories, and the distance between the warps is called the strand, and the woofs pass through

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them. The Comber is fastened to the fabric in front of the woofs yarn and puts the woofs in its final position. This means that the woofs is woven close to the previous woofs and the fabric is woven (Younesi and Khalil Khairi, 2002). The variety of textile factories and workshops is directly related to the design of the fabric and as the fabrics are divided into different types such as gauze, knit felt and ... and differ in terms of design, the texture is also different. Different fabric designs vary depending on the type of texture and the type of bonded yarn (Yavari, 2002). The fabric warp and woof can overlap in a variety of ways. The order in which the warp and woof come together are called fabric designs and it is very important in the appearance of the fabric and its consumption properties. There are three main types of textiles in design (Younesi and Khalil Khairi, 2002).

Taffetized texture is one of the oldest, simplest, most durable types of fabric, with woofs threads alternately, one another one, pass under and over the warps thread and the two sides have a similar display (Khalil Khairi). The number of affiliates in the textile industry is known as taffetized texture that is suitable for both heavy and light weight fabrics and there are many uses that can be made using phantasy colored yarns to produce a variety of fabrics. This texture also has derivatives or similarities, and new texture can be accessed by spreading the taffetized texture along the warps and woofs (or both directions) (Yavari, 2002). In examining the weaving technology and it's evolved and progress, it was necessary to examine the types of fibers from which textiles and garments were made. After fibers, the second most important issue is spindle and yarn spinning methods as well as fabric knitting tools. According to historical evidence, sheep wool has been used in the fabric since the beginning of Neolithic period. Sheep wool is the oldest fiber used in knitting in Iran. Tame the sheep may start in the Iranian plateau and dates back to the Neolithic period (Wolf, 1992). In the early Stone Age, sheep were not only used for sacrifice, but they also used for milk and shepherding the sheep because the technique of spinning and weaving had progressed (Pope, 2001). Silk is another type of animal fiber that originally used by the Chinese. In the first millennium BC, the Persians also cultivated silk. The earliest traces of the use of Chinese silk in Central Asia are found in the first half of the millennium BC. Herbal fibers have been of human interest in the past and used to produce textiles. During the Neolithic period, flax fibers were used in the fabric of textiles. In Iran, the flax cultivation site was the foothills of the north and west (Wolf, 1992). Hemp is also one of the fibers of ancient times for the production of textiles of human interest. Hemp was probably used as a food during the new Neolithic period (Pope, 2001).

One of the problems most people have when going to a hairdresser is having a hairdresser bag or pack that can carry it easily and, after every use, there is no need to washing and cleaning the cosmetics thoroughly. The importance of the subject becomes clear when the use of an antimicrobial cloth can also solve the mentioned problem and also be biocompatible. Formerly used to wash hairdressers with substances such as alcohol to remedy this problem, however, inserting these things into a bag or packaging can cause contamination and on the other hand Packages available in the market for hairdressers is more like a handbag which has no special place for the equipment and it often holds things together in a compartment with zipper or the button. In this thesis, we will try to design a set of fabrics for placement of hairdressers. It is designed specifically for each of the tools used, including scissors, combs, foil, clips, and razors and so on. However, the fabrics used in this packaging have antibacterial properties to aid the health of the users. According to the researches, there is no academic and written research in Iran for designing hairdressing supplies and accessories and so fabric design is not scientifically done either. But in the marketplace for accessories, hairdresser accessories are often made of plastic and less environmentally friendly. While their designs are not thoughtful and practical, they are merely a place for multiple tools. Most of the packages in the market are stereotyped and none have

antibacterial properties. One of the textiles that have always been a health concern for families is the textile packs of hairdressers, because it is in contact with body skin when making up and it can cause sensitivity if the materials used are not desirable and lack the standard and hygiene and in the long time lead to skin diseases. This is especially threatening for infants and children with sensitive skin. So keeping it healthy has always been important. Therefore, fabric packs of hairdressing tools that can enhance this issue, have particular importance. Accordingly, the following research questions are asked.

1. How to make a cosmetics pack that does not need to be washed?
2. Why is a Hairdressing Pack needed to be designed?

2. Research Methodology

The method of data analysis in this thesis is qualitative and quantitative Thus, according to the designs done in the field of hairdressing pack, the aesthetic analysis of designs will be done qualitatively. But in the laboratory, given the data, data analysis will be quantitative. The research method in this study is descriptive-experimental. The method of collecting information in this study is laboratory research and in the practical part, the laboratory method has been used. The library method uses formal and informal written documents including theses, books, articles, databases, research and information, etc., and the laboratory method has used laboratory data acquisition.

2.1. Materials and Used Devices

The project used the consumable chemicals listed in Table 1.

Table 1 Characteristics of the chemicals used

Name of the material	Manufacturer name	Chemical formula
Silver	Sigma Aldrich	Ag
Copper	Sigma Aldrich	Cu

The specifications of the devices used are also given in Table 2.

Table 2 Specifications of the devices used

Device name	Manufacturer	Description
Oven	Shimifan-Germany	-
Magnetic stirrer	Heidolph- Germany	-
Digital Balance	KERN-Germany	0.0001 g Accuracy
Ultrasonic bath	EURONDA- Italy	Frequency: 40 kHz, Power: 100 W

2.2. Fabric Preparation

The cellulose fabric was first washed with distilled water. The nano-composites were then inserted into the ultrasonic bath with specified percentages (1.5% wt of nano-materials). At 50°C the suspension was prepared after 30 minutes. The fabric was then added to the bath and placed under ultrasonic waves to complete the fabric. Finally, the sample was washed and dried.

2.3. Antimicrobial Test

The quantitative evaluation of the antimicrobial activity of complementary fabrics against Gram-positive Staphylococcus aureus (ATCC 25923) and gram-negative Escherichia coli bacteria (ATCC

25922) was evaluated according to the 2004-100AATCC standard method. In this method, the specimens were placed at 10 × 10 mm in the vicinity of a bacterial suspension prepared based on McFarland half. The samples were then incubated in the incubator at 37°C for 24 h and then, for quantitative examination of the microbes, 100 μL of tryptic soy agar were placed on a plate. For bacterial growth, the culture media were incubated for 24 h in 37°C incubation. Finally, the number of bacterial colonies in each container was counted and the percentage of bacterial decline was calculated using the following equation:

$(R)\% = (A-B) / A \times 100$

In this equation, A is the number of raw colonies (control), B is the number of secondary colonies (solution adjacent to the treated product) and R is the percentage of bacterial reduction in the treated sample compared to the control sample.

3. Antimicrobial Activity Results

The spread of various diseases by pathogenic bacteria and their resistance to antibiotics has led researchers to seek safe and hygienic ways to produce products suitable for human well-being. With the advent of nanotechnology in the present century, nano-materials such as silver, gold, zinc, copper and titanium dioxide have been used as antimicrobial agents. In this study, the antimicrobial efficacy of cotton samples in reducing the two common strains of Gram-positive Staphylococcus aureus was the source of eye, skin, bone and joint infections and Gram-negative Escherichia coli bacterium is origin of urinary, nosocomial and blood infections. The quantitative values of the antimicrobial test of the samples indicate that the raw fabrics have no microbial properties and in the treated samples the percentage of bacterial reduction for Gram-positive Staphylococcus aureus was 97.3% and Gram-negative Escherichia coli was 100%. Therefore, the use of these nano-particles facilitates the decomposition of bacteria. Bacterial breakdown by the desired material can be caused by the destruction of the membrane, wall and enzymes of the bacteria.

3.1. First Proposed Design Analysis: Oyster Design

Packaging is an indispensable component of a product that recognizes and maintains the product from production to consumption, which should have a beautiful appearance and protect its contents. Packaging in today's world has a meaning beyond the aesthetic. Using different types of packages, while also providing better storage capability, is also effective in gaining a higher market share for the product in question. Inadequate attention to the standards of hygiene kits made hygiene away from important products and despite having very good quality at production due to the emergence of some secondary contamination or supply in sizes or off-standard items they cannot reach the global markets. Obviously, with the implementation of hygiene packaging plans, we will be able to compete with similar foreign products in the global markets. The science of packaging design, the art and technology of product protection is to store, store, transport, and distribute sales inventory and use in such a way that the least damage to the product content is consumed during production. The material chosen to cover the product is important in this project to try to make more use of the fabric to help make these tools antibacterial, the main task of the product protection packaging. The packages include its physics and graphic design. In the first case, in terms of physics design, the product case tried to have a boxed case design and be able to fit antibacterial fabrics into it. Cosmetics are related to the skin. The oyster shells make the epidermis or layer on the skin soft, and the appearance of this coating is like the oyster that externally encapsulates the graphic in the hands of the target audience for softness and protection and inside the wraparound eyelash curler, which is

covered with antibacterial fabrics, does not allow any bacteria to enter the box and after each use of eyelash curler by placing the fleece inside the box and the eyelash curler contact with the antibacterial cloth kills any bacteria. Because the shell has the task of protecting the pearl within it, it protects our eyelash curler product and it doesn't allow bacteria to enter. The designer in this packaging has likened the eye to a pearl that is sensitive and there should be no contamination, and it has two upper and lower eyelids similar to the mussel in which the product is housed and covered. It also prevents breakage from getting wet and so on. The reason for the use of white in the antibacterial fabrics inside the shell is because of its purity, cleanliness and sterility and like a pearl that has a special shine, in the shell that opens, the color of the fabrics has a special shine and given the character of the fabrics, the designer has been trying to shine inside the shell with this color and show the tool being very clean.

Fig 1 Oyster Design

3.2. Second Design Analysis: Pad Design

Objects inside the pack need protection from other factors such as germs, heat, and so on. It is used to suit the different product packaging considered. Protections against depletion of oxygen, water vapor, dust, ultraviolet radiation, etc., are included in the package. Pack impermeability is an essential factor in packaging design and maintaining the quality of the contents inside the package and extending its service life is one of the most important tasks of packaging. Packages must have features that make it easy to redistribute, move, display, open and reopen, sell, use. Packaging is a

complex, dynamic, scientific, artistic business operation that encompasses at its most basic the functions of protection, maintenance, transportation, information and sales. Packaging is a kind of service performance that cannot exist by itself, because it needs a commodity. If there is no product there will be no packaging. Today packaging is economical and easy to transport. Price, time, and the right place determine the free market economy. Today's packaging must be designed and manufactured according to international standards. Because the packaging should have at least a share of the finished price per unit of product, In addition, the packaging is considered to be free of charge and an interest in the buyer. In fact, the packaging should have a beautiful appearance, protect its contents and be able to be arranged in bulk and positioned on standard pallets and finally have the necessary shelves on store shelves. The packaging design of the makeup pad is inspired by the milk envelope packaging, which evokes a sense of cleanliness. Natural beauty experts say milk can soften, brighten and exfoliate skin and even more so, it will help your skin so it is the best option for the skin and packaging you want. The most important issue in women's skin care is that this design has been presented with a focus on the perception of milk that symbolizes health, repair, softness, and more. Therefore, the design of this packaging is white, which symbolizes purity and innocence, reflecting light, color, freshness and simplicity. White is a blank canvas and a sign of cleanliness, equality or a new beginning. As a color in packaging design, it is a sign of the security and conservatism of the product. But it's a good choice for expressing a picture of cleanliness, cleanliness, efficiency or simplicity. Adding a few more colors to the color of the packaging design can create different messages in white. Therefore, in the design of this product, the color blue that is the color of trust, honesty, power and unity has been added and used alongside white. When used in the design of packaging the color blue undoubtedly expresses the confidence that the customer can have in the product. Also, the use of pale blue makes the product more creative.

Fig 2 Pad Design

3.3. Third Design Analysis: Brush Design

When designing a cosmetic bag, one should note the key points that make it easy to use and application, including:

- Saving in Application
- Reduce the amount of waste and reduce the cost of finished goods
- Help to make informed purchases
-Ease of use
- Help to raise the standard of living
-Help to increase employment and income levels
-Help to reduce severe disease
-Keeping the product healthy

The design of the bag for thermal hair brush is made of a rectangular shape proportional to the position of the main part of the brush that has direct contact with the hair and is suitable for germs. Covered with an antibacterial fabric, it does not allow any bacteria to enter the box and after each use by brushing it inside the box and contacting it with the antibacterial cloth, it kills any bacteria. The packaging must be designed in such a way that it contains the least amount of ingredients and at the same time fulfills its task. Material reductions in this way make subsequent considerations and measures regarding reuse, recycling and recovery of the excess material unnecessary. Various marketing studies have shown that packaging design is one of the most effective marketing tools for sales. The ultimate driver of success is packaging design. The design should be designed so that any group of people can understand it and understand the product's performance. Now if they are in the category of illiterate, children and so on, the cover design is proof of the beauty of the hair and the freshness of the product. Proper use of color also transmits the message and makes it easier to find the product in the shop layout. Another point is that although the use of four colors is valuable. The relationship between colors and concepts such as masculinity, femininity, and so on; for example, the relation of red to aggression and masculinity as opposed to pink and its relation to softness and femininity. Blue is known for calm, white for purity, and so on. There is a subtle and subtle connection between color and culture that varies from culture to culture. In terms of the inner concepts of color, especially the emotional aspects of it, individuals also extract more subtle influences. Effects that is effective in expressing the shape, texture and identity of the object. Therefore, this important color feature can be used to provide a specific identity to the product and in other words, a product can be visualized using color, visually feel, warmer in heat, lighter in weight and even smaller in size. Therefore, the color of the product is pink. Pink is one of the most delicate and sentimental colors. It gives the audience a sense of cleanliness, comfort, hope and comfort. The target audience is young girls, children and even women.

Fig 3 Brush Design

3.4. Fourth Design Analysis: Face Threading Design

Packaging is an art or operation used in preparing work for shipment and / or delivery to the customer, and can also be said to be a container that accommodates customers. The design of the face threading box uses a design that resembles the cocoon of soft, delicate silk, delicate silk that is found by opening the box and separating the butterfly on the cocoon cover. Silk cocoon has a sense of softness, softness and cleanliness. Inside the box is covered with an antibacterial cloth that after each use it removes all the germs in the box and is clean and free of any germs for later use. The first thing that comes to our mind is that the packaging is the protection and preservation of the product inside. Although the concept is based on the concept of packaging, it does not have the role of today's packaging. In today's world, packaging has important and varied roles. Concerning the role of packaging in the modern world, there are various classifications, each of which are comprehensive.

Packaging Applications:

- Introducing the name and logo of the product
- Motivate customer buying
- Direct communication with the consumer and tips on how to use it
- Indirect communication using specific colors, shapes, or genus that reflects the quality of the product.
- Creating new markets

In fact, today, unlike in the past, multipurpose packaging has functioned. In the past, packaging was only used to transport and protect the product from failure or breakage. Purple color has been used in the packaging design for this product. This color, in addition to creating a spiritual state of relaxation, is a happy and vibrant color and older ladies and young girls are in favor of this color. It is almost a mysterious color that many people are very fond. The purple color evokes a sense of gentleness, a sense of nostalgia and romance.

Fig 4 Face Threading Design

3.5. Fifth Design Analysis: Sandwich Design

Curious about opening a product box is one of the instincts, or in other words, of many people's favorite pastimes. The more attractive and beautiful the packaging of the product is, the more willing the customer will be to buy. On the other hand, the packaging represents the kind of value that the manufacturer places on its product. Clearly, cheap, low-quality packaging drives the customer's mind toward a low-quality product. Sometimes a quality product only fails because of poor packaging. Packaging enables better service delivery from the manufacturer to customer satisfaction. Sandwiches are a food that everyone wants to have in their meals, because in addition to the deliciousness, the ease of desire has caused this tendency, since this dish contains all the ingredients and the person has the contents and the bread in their bread, the design of the bag for hairdresser accessories came with the idea of a hamburger that people can put all the products in the bag after the job, to disinfect all the antibacterial fabric in the bag and it's completely clean for later use. This design gives the customer a sense of cleanliness from the food. Conservation and

protection of chemical, physical and mechanical agents have long been one of the benefits of this project and better engineering. As a result, there is more layout and order in stores and better efficiency and ease of use. On the other hand, color not only plays an important role in the packaging design of products on the shelf, rather it transmits an advertising message, encouraging consumers to buy that product. The packaging of this product uses a golden color that symbolizes kindness, care and love that adds to the charm and beauty of this packaging. Gold is a color that indicates the superiority and specialty of a product.

Fig 5 Sandwich Design

4. Conclusion

Modern fabrics are an important factor in expressing the creativity of artists. Today, with the development of fabrication machines, various fabric packages are produced and supplied. Maintaining the health and well-being of hairdressing tools and accessories is emphasized by male cloth packaging. Therefore, the design of hairdressing cloth packages that will be able to maintain and promote skin health will be of particular innovation. The production of modern and efficient hairdressing textile packages has led to a dramatic change in the field of textile design in this area and designers use new fabrics for their purposes and influence the shape, design and appearance of packs by choosing the type of fabric. Fabric designers use these achievements as a means of presenting their designs in today's world. This thesis attempts to present and design hairdresser packs with two basic categories, namely the principle design as well as the use of antibacterial property. In this thesis, nano-copper and nano-silver have been used to complement hairdressing packaging to improve consumer health. On the other hand, color science and design principles were

also used to improve the mental health of consumers and finally pack were designed with such features. The fabric packs contain nano-materials that can eliminate bacterial contamination of the tool when contacted by a hairdresser and on the other hand, we have tried to play an important role in their design by applying design principles and scientifically using color as one of the main foundations of the visual arts. Due to the process done in this thesis, it is suggested that different methods such as electrification for the design of hairdressing packaging be used to develop such textile packages.

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