Influence of Socio-Cultural Factors on the Formation of Architectural Spaces (Case Study: Historical Residential Houses in Iran)

Reza Askarizad [1]

Abstract

According to many researchers, "culture" is the main factor in the formation of architectural spaces and plays an important role in social sustainability. Therefore, studying culture and its impact on architectural spaces is important in order to understanding human behavioral patterns. In this research, it has been attempted to examine the influence of socio-cultural factors on the formation of architectural spaces by applying a descriptive-analytical method and using library resources. Also space syntax method was used in order to evaluate the influence of social aspects on the formation of architectural spaces. The results of this study indicate that the structural system of traditional Iranian houses is based on a hierarchical system so that in order to reach the private space, it has to pass through a few intermediate spaces. This way of reaching from the public space to the private space has also been derived from the culture and customs of those regions. In this way, it can be concluded that socio-cultural factors have a great influence on the formation of architectural spaces. Also, the cultural concept of the architecture prioritizes its material meaning and the architecture is just through socio-cultural organizations that come to the vitality.

1 Department of Architecture, ACECR University, Rasht, Iran

1. Introduction

According to many researchers, "culture" is the main factor in the formation of architectural spaces and plays an important role in social sustainability [1]. The culture of any society is based on the history, civilization, customs and beliefs of that society and architecture is also a symbol of culture that has evolved over the course of history, and due to changes and the degree of cultural impact, new styles and methods have emerged and created special spaces in the architecture [2]. Architecture also emerges as a social phenomenon of culture and affects it, and is a reflection of human thought in relation to space, aesthetics and culture of various societies; that's why, the architectural style of each period is a reflection of the culture and art, and is proportional to the changes that take place in the arenas of life and art [3].

In the meantime, Iranian architecture has been developing its path in the context of the Islamic culture ruling society [4]. Hence, if we construct an architecture based on mental forms [5], we find that the form and system of city organization and the architecture of each region are influenced by its socio-cultural environment [13]. In this way, it can be argued that basically recognizing architecture through the recognition of different layers of socio-cultural influences is possible [14]. Some theorists argue that architecture, like clothing and other human resources, is a means to adapt to the environment without altering its physical structure [15] and what makes this matching possible is culture or, in other words, his mental system [6]. That's why architecture can be considered as a basic phenomenon of culture and the sign of a belief [5]. To the extent that it ready to take its demands for executive and economic problems [7; 8]. The interaction between cultures, civilizations and societies in various fields of thought, science,

behavior and art is indisputable, and of course the necessity of the human community. Architecture is no exception to this, and it seems that the study of the impact of socio-cultural factors on the formation of architectural spaces is considered important. In this research, it has been attempted to study the influence of socio-cultural factors on the formation of architectural spaces by examining the descriptive-analytical method and using library resources. Also space syntax method was used in order to evaluate the influence of social aspects on the formation of architectural spaces. Hence, this question is posed to find an appropriate answer to how can socio-cultural factors influence the formation of architectural space?

2. Literature review

2.1. Culture and Its Various Dimensions

Culture is one of the words which have widespread usage in various texts, which make it more ambiguous and complex. Of course, this high range of use is a sign of the hidden dimensions of culture that enables it to penetrate in different fields. The importance of culture is to a degree that some people consider it as making human beings distinct from animals; In other words, they say that "human being is an animal with culture" [7]. The impact of culture does not just come to the society, and it can be a primary factor for individual differences [6]. The same variety of assumptions, make it necessary to further explore its position in architectural studies and examine its dimensions and definitions [8].

The word "culture" in English, literally, with the meanings of cultivation, it has been linked to the root of "agriculture", animal breeding, and also the concept of religious worship [9]. What is perceived as such lexical communication is the word "culture" to human education with a particular purpose. But

this word is among the Western scholars, described in various ways, which seems to be the common ground between these definitions. Many of the definitions that refer to the concept of culture tend to shelter the cultural expressions and elements more than anything else and it's not a matter of mind that the concept of the broadness of culture in the definition is so difficult that we resort to its manifestations and necessity in order to properly understand it [8].

2.2. Background Studies in the Field of Culture and Architecture

"Amos Rapoport" is one of the researchers in the field of culture and architecture and has obtained a theoretical framework in this field of activity. In an interview published in 1992, he describes the process of his scientific activity continuously and on a specific procedure [18]. He has worked in his articles and books in two ways. It seems that the foundation of his work is to look at those architectural examples that have occurred in the past. Because in the past human attention has been higher in its environmental order. In his research, he is seeking a comprehensive view and so it tries to use a wide range of examples, both spatially and temporally and he believes this factor can be a guarantee of the integrity of his views [5]. In his two articles titled "The Cultural Origins of Architecture" and "Invention of Architecture," he has acted like this. What is most evident in these articles is the proof of the effective and superior relationship of architecture with the field of culture. In this research, he uses other sciences such as archeology. Another form of Rapoport's writings refers to general and theoretical arguments that, far from the discussions, merely attempts to draw up a theoretical framework for mapping the relationship between culture and architecture [5]. In these writings, he tries to classify culture into tangible subsets in the process of architectural design using

the notions in cultural anthropology and establish a relationship between these concepts and issues related to architecture [19]. Among other people who have been active in the field of culture and architecture for a long time, one can mention "Paul Oliver", who has also collaborated with Rapoport. Like Rapoport, he has built the axis of his research into native and traditional architecture, and even collected a dictionary of native architecture in this regard [21]. In another work, he has compiled important articles in the field of cultural and native architecture in a book [22], which he has already experienced in such a book [20]. In these books, he most of all seeks to highlight the importance of cultural categories in architecture using exploratory research [8]. But, apart from these people, others have been more focused on this kind of research using architectural theorists. What is presented in the article "Architecture and Culture: A Research Strategy" is further seeking to prove the importance of cultural studies [23]. Although this is in line with many of the activities already outlined above, but this study, unlike the previous one, did not make use of the case studies, and most of it refers to the process of developments in theoretical foundations of architecture [8].

2.3. Culture as a Main Factor in the Formation of Architecture

Researchers believe: "Architecture is an institution with multidimensional function rather than a physical structure affected by society, culture, religious faith, economy and environmental conditions. Since architecture is a cultural thing, its form and organization is also influenced by a culture whose architecture is its product." [20]. Therefore, architecture conforming to their cultures and spatial discipline, represents the social relationships of the people residing there. In reviewing the architecture, in 73 different cultures, it was observed that the

degree of division in the interior of the buildings depends on the extent of the socio-political complexity of that culture [17]. According to the view of the cultural-oriented researchers, culture is the main factor in the formation of the architectural space, and the factors like climate, site and etc. are among the top two factors [1]. As Rapoport says the local or cultural tradition has a direct connection with the physical structure of each culture. In other words, they are both necessary for each other [16] (Table 1).

Table 1- The formation of houses of Iran is influenced by the culture of that area

Borojerdi's House	Tabatabaei's House
The influence of cultural factors on the formation of the architecture of traditional Iranian houses has led to the formation of an introverted architecture in these areas.	The central courtyard position in traditional Iranian houses has been derived from the socio-cultural and climatic factors of that region.

2.4. Culture, Identity and Architecture

Traditions and customs are among the methods that lead to the emergence of norms which create culture. A norm is referred to as a fixed standard of what must exist in a particular culture. A city in which fixed criteria and norms are used is said to have a normative structure. The concept of culture, along with the concept of society, is one of the concepts used in sociology. Culture is the value that members of a given group believe in it. Culture creates a set of rules that forming the shape, is a reflection of it.

People mean their environment through the help of culture, the set of values, beliefs, worldliness and common symbolic systems. In this way, the material product of society is a sign of the culture of that society. The most important material product of a community is the physical and urban structure that society creates for itself to grow and transfer the culture from a generation to the next generation. Therefore, the physical quality of the environment is not only affected by culture, but also influences the transfer of culture to the next generations [10].

Values are abstract ideals, while norms are meaningful principles and rules that people are expected to regard it. The norms indicate should and shouldn't in social life and create customs and traditions. In a society that has a normative structure, the individual learns through socialization that, what patterns of behavior are acceptable in different situations. Social supervision is in fact the extension of the socialization process. This supervision is related to methods and devices that are used in the community in order to enable individuals to adapt them with the eyes of a particular group or community. Therefore, culture is related to the lifestyle of members of a given society and their habits and customs. Society refers to the system of mutual relations that relate to those who share a common culture [11].

Figure 1- Pedestrian zone of municipality public square of Rasht in Iran which demonstrate their culture by sculptures in urban spaces

Edmund Bacon (1979) looks at how to formulate a coherent urban architecture in the relationship between architects who worked in a space but at different times, and says, referring to a second person's theory: It is the second designer who determines how his work is valuable whether the effect of the first architecture is worthless or not. In other words, with its approach to society and the acceptance or rejection of the culture of the past, determines whether the artwork of the first person was found or destroyed. This is the approach taken by the Renaissance designers with the goal of creating a designed urban space and looking at the architectural implications of their works in favor of coordination in the public space. This is a completely specific cultural approach that the designer has preferred to coordinate the environment with the creation of a reputed architecture [10].

2.5. Transformation of Housing Form and Traditional Lifestyle in Iran

Settlements have historically been shaped by their need to be compatible with social norms and lifestyles. As Nasr noted, the external environment which man creates for himself is not more than a reflection of his inner state [35]. This reveals the connections between social needs and the built environment. The prevailing lifestyle, rooted in social and cultural characteristics of the society, is embodied in the composite elements of residential units. In many Muslim societies, the traditional house was developed to accommodate an extended family comprising several generations [36].

The spatial characteristics of the house offered each generation the possibility of adhering to its own way of life, while at the same time maintaining a mutual relationship between generations. The dominant household model in Iranian traditional society was the patriarchal extended family. Its members would include an initial couple, its children, and families of these children [37]. It is expected that in a traditional urban house, the initial couple would have 6 to 7 children who would marry in their teens and remain close to the family after marriage. Furthermore, polygamy was common in wealthy families, which further increased the number of family members. It is apparent that in these conditions, the residential unit should accommodate the changing needs of a rapidly growing family [36].

Extended families were the dominant household model in Iran, composed of up to three generations, living together in the same house. After the sons' marriage, according to the household economic conditions, the house would expand or be sub-divided to create new living spaces. In this case, the house, like a living organism, would grow and adapt to the new situation. Most houses accommodate varied functions, not limited to residential activities. In some cases, the house was also the workplace. Women had an important role in household economic activities. Apart from cooking, washing clothes and dishes, and taking care of children, they produced handicrafts such as rugs and textiles [38]. House spaces were adapted for these varied activities. Therefore, an Iranian house was a multifunctional unit designed for residential, economic, and service functions [36].

3. Materials and Methods

3.1. Space Syntax and Its Role on Social Logic of Space

Space syntax Theory, introduced in 1976 by Bill Hillier and his colleagues at University College of London, is founded on the concept that the physical and spatial configuration of the built environment,

informs us how space is experienced, explored and apprehend [27; 28]. By analyzing a series of spatial characteristics, space syntax helps designers to understanding the role of spatial configurations in shaping patterns of human behavior and to estimate the social effects of their designs. This analysis model enables us to study the causal relationships between the form of architectural or urban spaces and its modalities of use and occupations [29].

Space syntax analysis quantifies relationships between social life and the built environment on the basis of the spatial configuration approach to exploring relationships between social behavioral pattern of the people and physical structure of the space [30]. According to the fundamental theoretical concept of space syntax, space is shaped in ways that reflects the direct interaction between space and people, and through this the space we create, or the built environment, becomes humanized [31; 32; 33]. Numerous studies have validated this method [24; 28; 33; 34].

3.2. Case Study

In this research, two historical residential monuments were selected in order to find the appropriate answers to the research questions, which are famous as Iranian architectural symbols. These two monuments, named Tabatabaei and Borujerdi house, are located in the city of Kashan. First of all, when you come to the great city of Kashan you should really visit Tabatabaei house, which is the pearl of Kashan. This city is known for its beautiful houses that can be regarded as palaces that rich businessmen dwelled in as stopover places. Nowadays they are well preserved tourist attractions to visit in this desert city. One can admit that this house is definitely the most outstanding one here. It enjoys the art of symmetries which have made this edifice wonderful in terms of its architecture [12] (Figure 2).

Figure 2- Tabatabaei Historical Residential House [25]

Borujerdi historical monument is another house worth being visited in Kashan and it is the famous Borujerdi house whose owner was a wealthy businessman of the city of Kashan. Like the Tabatabaei house, you will definitely enjoy your trip back to the past time to someone's private life and residence place which is now another architectural attraction of Iran. The layout, plaster work and pool of the house are amazing and will make you spend a memorable time there. This luxurious house was built with very simple material and equipment. It is very well preserved with intricate design. You can never spend enough time looking at its beauty. The house has things to tell you and you can explore many different fantastic Iranian arts on walls, mirrors, colorful windows in rooms, halls and its several yards [12] (Figure 3).

Figure 3- Borujerdi Historical Residential House [26]

4. Results and Discussion

Analysis of the Social Logic of the Case Study by Space Syntax

The results of the analysis in the Tabatabaei House by Depth Map software in the test of axial map indicate that the longitudinal axis with the integration of (5.10) have the highest rate among the other movement axis. Also, this axis has the best accessibility with the connectivity of (48). Also analyzes carried out from Borujerdi house indicate that the longitudinal axis with the integration of (9.67) have the highest rate of integration. Also this axis with the connectivity of (42) has the best accessibility (Table 2).

Regarding the movement behavior of people in the interior spaces of the Tabatabaei House, according to the analysis of the VGA test, from the view point of the interior space indicates that the central court yard of the house with the scope of view (2589) has the greatest effect on people's behavioral pattern. Also, the results of the visual connectivity test in Borujerdi house indicate that the central courtyard of the house with the scope of view (9938) has the greatest effect on the movement behavior of the visitors. Also, the results of the Isovist test from the view point of observers also indicate that visual connection exists at most points of central court yard, which involves the formation of coherent and imaginative patterns in the minds of the audience and the prediction their behavioral motion is influenced by space (Table 3).
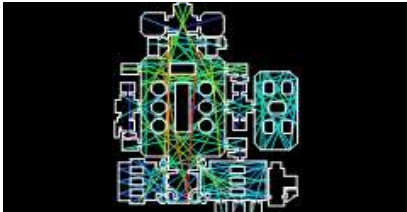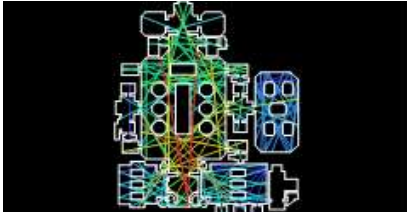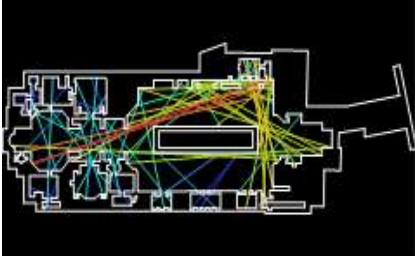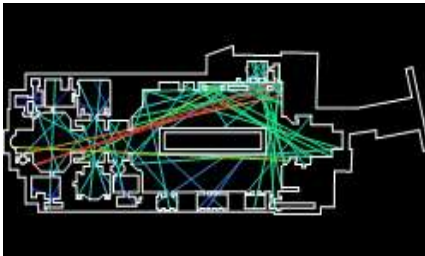
Table 2- Axial Map test of the Case Study
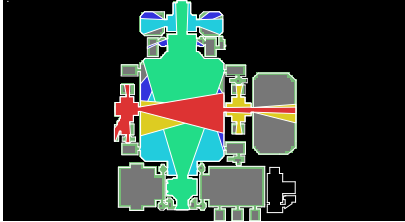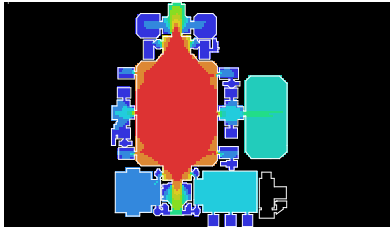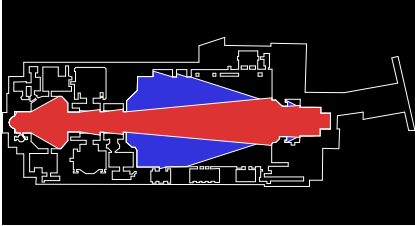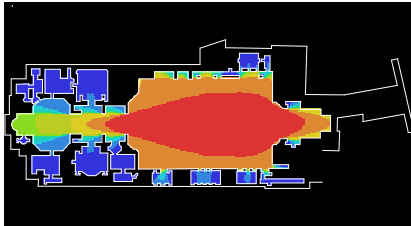
Connectivity	Integration	Plan
		Tabatabaei House
		Borujerdi House

Table 3- Visibility Graph Analyze of the Case Study

ISOVIST	VGA	Plan
		Tabatabaei House
		Borujerdi House

The results of this study, which describe the applied method of space syntax in the tradition residential houses in Iran, are shown in the form of analyzes in Tables 2 and 3. The results are presented in the form of numeral outputs in Chart 1. These numeral data is derived from graphical analyzes, which illustrates the influence of social factors on the formation of traditional Iranian houses. The comparison of social logic in traditional Iranian houses suggests that these houses are very similar in terms of social structure (Chart 1).

Based on the findings and analysis of the architectural spaces of these houses by the method of the space syntax, one can conclude that the main structure of the formation of these houses is introverted, so that the central courtyard of these houses is a space for social life and has a suitable vitality. An important point in shaping the social structure of these houses is their hierarchical system; so that in order to reach the private space, it has to pass through a few intermediate spaces. This way of reaching from the public space to the private space has also been derived from the culture and customs of those regions.

Comparing the social logic of traditional Iranian houses

	Integration	Connectivity	Control	Mean Depth
Borujerdi House	9.67	42	2.5	3.82
Tabatabaei House	5.1	48	2.93	4.02

Chart 1- Comparing the Social Logic of Traditional Iranian Houses

5. Conclusions

The objective of this study was to investigate the influence of socio-cultural factors on the formation of architectural spaces. The interaction between cultures, civilizations and societies in various fields of thought, science, behavior and art is indisputable, and of course the necessity of the human community. Architecture is no exception to this, and it seems that the study of the influence of social-cultural factors on the formation of architectural spaces is considered to be important.

Results of this research have shown that culture is the main factor in the formation of the architectural space and factors such as climate and site are second-rate factors. Also, studying the architectural form and spatial relationships of buildings in different countries indicate that the internal relations of architectural spaces in each region are derived from its culture. Also the comparison of social logic in traditional Iranian houses suggests that these houses are very similar in terms of social structure.

Based on the findings of the analysis of the architectural space of these houses by the method of the space syntax, one can conclude that the main structure of the formation of these houses is introverted, so that the central courtyard of these houses is a space for social life and has a suitable vitality. An important point in shaping the social structure of these houses is their hierarchical system; so that in order to reach the private space, it has to pass through a few intermediate spaces. This way of reaching from the public space to the private space has also been derived from the culture and customs of those regions.
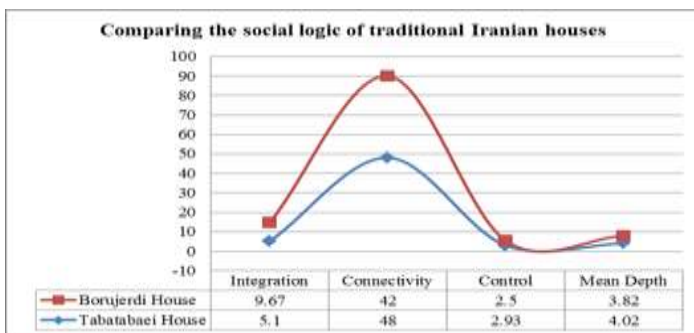
A research by Alitajer & Nojoumi (2016), analyze behavioral patterns in the spatial configurations of traditional and modern houses. The findings of this research confirm that the integration level of the public spaces in traditional houses of Iran is higher than its private sections and private territory is one of the major principles of Iranian traditional residential houses [24]. In this way, the findings of this study are consistent with the findings of the present study and were not found to be contradictory.

Hence the consideration of the hierarchical system in the design of traditional Iranian houses can be derived from the culture and customs of those regions. Because the Islamic architects at that time, took advantage of Islamic principles, tried to reconcile the architectural monuments with that principles, that privacy was also one of them. Thus, it can be concluded that socio-cultural factors have a great influence on the formation of architectural spaces. Also, the cultural concept of the architecture prioritizes its material meaning and the architecture is just through social-cultural organizations that come to the vitality.

Acknowledgement

References

[1]. Memarian, G, H., Hashemi, S, M., & Kamalipour H. (2010), The Effect of Religious Culture on the Formation of Home. Comparative Comparison of House in the Muslim, Zoroastrian and Jewish Quarter of Kerman, Iranian Journal of Cultural Research, Vol. 3, No. 2, Summer.

[2]. Shoa'ee, H, R., & Amerion, E. (2015), Influence of culture on the formation of native architectural spaces. Case study: Natural structure of indigenous buildings of Gorgan city, Presented at International Conference on Science and Engineering, Emirate-Dubai.

[3]. Khalilifar, M., AmiriManesh, M., & Zare, S. (2013), The Impact of Culture on the Formation of Residential Architectural Spaces in Iran, Presented at The First National Conference on Residential Architecture, Malayer.

[4]. Maleki, M, R., Parsa, S., Moradi, E., & Vasigh, B. (2013), Recognition of Islamic Architecture and Urban Planning in Contemporary Period, Iranian Journal of Islamic Studies, No. 12, Summer.

[5]. Rapoport, A. (2003), Invention of Architecture, From Cave to City, Quarterly Journal, No. 8.

[6]. AskariKhanghah, A., & Kamali, M, S. (2008), General Anthropology, Fifth Edition, Tehran.

[7]. Rouholamini, Mahmoud (1998), The field of compilative philology in Anthropology, Fourth Edition, Attar, Tehran.

[8]. Mozaffar, F., Hosseini, B., & Mojiri, A. (2012), Culture in Architectural Research, Housing and Environment Journal, No. 138, Summer.

[9]. Smith, F. (2008), An Introduction to Cultural Theory, (Translator: Pooyan), Office of Cultural Research, Tehran.

[10]. Nasseri, S. (2013), Application of Technology and Identity Crisis in Contemporary Iranian Architecture in the Age of Globalization and Providing Solutions Out of Situation, Urban Management Publication, No. 41, Winter.

[11]. Giddens, A, (2000), Sociology, (Translator: Patience), Ney Publication, Tehran.

[12]. https://www.irantravelingcenter.com/tabatabaei-house-kashan/

[13]. Bulut, Y. (2007), Fountains as urban furniture in historical urban structure and usage culture, Building and Environment, Vol. 42, Issue 7.

[14]. Baydar, G. (2004), The cultural burden of architecture, Journal of architectural education, 9.

[15]. Dezuari, E. (2010), Social change and transformations in housing, ISSJ, UNESCO, 10.

[16]. Rapoport, A. (1969), House Form and Culture, Prentice-Hall, Inc., Englewood Cliffs, N.J.

[17]. Gifford, R. (1998), Environmental Psychology: Principles and Practice, 2nd ed, Allyn and Bacon: Boston.

[18]. Rapoport, A. (1992), Interview with Amos Rapaport. Arch & Comport. Arch & Behavior. 8.

[19]. Rapoport, A. (2008), Some further thoughts on culture and environment. Archnet-IJAR, International Journal of Architectural Research, 2.

[20]. Oliver, P. (1969), Shelter and society. London: Barrie and Rockliff. Cresset Press.

[21]. Oliver, P. (1997), Encyclopedia of Vernacular Architecture of the World. Cambridge University Press.

[22]. Oliver, P. (2006), Built to meet needs (Cultural issues in vernacular architecture). First edition: Elsevier.

[23]. Robbins, E. (1984), Architecture and culture: a research strategy. Design studies. 5.

[24]. Alitajer, S. & MolaviNojoumi, G. (2016), Privacy at home: Analysis of behavioral patterns in the spatial configuration of traditional and modern houses in the city of Hamedan based on the notion of space syntax.

Frontiers of Architectural Research. Vol. 5. Issue 3. 341-352.

[25]. https://friendlyiran.com/attraction/tabatabaei-historical-house/

[26].https://www.tripadvisor.com/Attraction_Review-g680023-d7066788-Reviews-Borujerdi_House-Kashan_Isfahan_Province.html

[27]. Hillier, B., Leaman, A., & Stansall, P. (1976), Space Syntax. Environment and Planning B: Urban Analytical and City Science. Vol. 3. Issue 2. 147-185.

[28]. Hillier, B., & Hanson, J. (1984), The Social Logic of Space. Cambridge: Cambridge University Press.

[29]. Ourique, L., Eloy, S., Resende, R., Dias, M.S., & Marques, S. (2017), Spatial perception of landmarks assessed by objective tracking of people and Space Syntax techniques, Presented at Proceedings of the 11th Space Syntax Symposium. Lisbon.

[30]. Hillier, B. (1993), Specifically architectural theory: a partial account of the ascent from building as cultural transmission to architecture as theoretical concretion. The Harvard Architectural Review, Vol. 9, 9–27.

[31]. Hanson, J., & Hillier, B. (1987), The architecture of community: Some new proposals on the social consequences of architectural and planning decisions, Architecture et Comportement/Architecture and Behavior, Vol. 3, Issue 3, 251-273.

[32]. Hillier, B. (2008), Space and spatiality: What the built environment needs from social theory, Building Research & Information, Vol. 36, Issue 3, 216-230.

[33]. Karimi, K. (2012), A configurational approach to analytical urban design: 'Space syntax' methodology, Urban Design International, Vol. 17, Issue 4, 297–318.

[34]. Safari, H., Nazidizaji, S., & FakouriMoridani, F. (2018), Social Logic of Cities and Urban Tourism Accessibility; Space Syntax Analysis of Kuala Lumpur City Centre, Space Ontology International Journal, Vol. 7, Issue 3, 35-46.

[35]. Nasr, S, H. (1978), The contemporary Muslim and architectural transformation of the Islamic urban environment. In Toward an Architecture in the Spirit of Islam. R. Holod, (ed.) Philadelphia: The Aga Khan Award for Architecture.

[36]. Mirmoghtadaee, M. (2009), Process of Housing Transformation in Iran. Journal of Construction in Developing Countries, Vol. 14, No. 1. 69-80.

[37]. Ladier-Fouladi, M. (2002), Iranian families between demographic change and the birth of the welfare state. Population (English Edition), Vol. 57, Issue 2, 361–370.

[38]. Soltanzadeh, H. (2005), From house to apartment. Architecture and Culture Quarterly, Vol. 7, Issue 23, 142–154.