

Continuous Reading and Change in the Spatial Configuration of Native Houses of Shiraz (Zandieh and Qajar) Using Quantitative Data with UCL Depth Map Software

Abstract

Most theorists of architecture believe that culture is one of the factors influencing home design. The spatial configuration of a house in an area can support or disrupt the culture of the inhabitants. Hence, the shape of the house in indigenous architecture is an expression of understanding the content of human life. The necessity of this research is explained based on the dimensions of family and social life. The houses of the Zandieh and Qajar dynasties of Shiraz, which are mostly located in the Sang-e Siah neighborhood, form the statistical population of this research which is of a diverse kind. The aim of this study is to read the spatial organization of the native houses of the old texture of Shiraz accomplished by Space Syntax and the graphical analytical analysis (SPSS) software. Based on the logical arguments gained from the little information obtained from the graphs output of the Ucl Depth Map software, the strengths and weaknesses of the native houses were examined. By analyzing the attained information, a suitable model was extracted in terms of socio-cultural concepts involving the ancient elements. According to the results of the research, by combining the model obtained from this research with modern residential replicas, an innovative prototype can be presented for the imminent houses of the historical cities of Iran.

Research objectives

1. Investigating the organization of the native houses of the old texture of Shiraz city
2. Explaining a suitable model for contemporary housing based on the ancient analysis of the models of Zandieh and Qajar period houses in Shiraz.

Research question

1. How has culture (residential and social) affected the formation of the Space Organization of Shiraz Houses (Zandieh and Qajar)?
2. What is the role of architects and planners in the present age in perpetuating the socio-cultural values of indigenous environments? To what extent are design software involved in this area?

Introduction

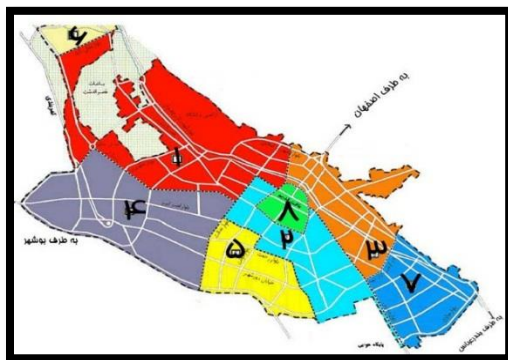
Culture as an achievement of human individual and social life, as much as it represents the assets of civilization, can also play a dynamic role in creating culture. Architecture is one of the most important branches of culture that the study and analysis of its developments can play a central role in shaping constructive patterns and strengthening useful cultural foundations. Architecture can be an appropriate platform for the reproduction of cultural ideas through the continuation of ancient styles and the study of architectural works of the Islamic period in Iran indicates this relative continuity (Ahmadi Zavieh and Golestan, 2018: 96). Today in architecture, increasing tendencies to cultural study, environmental design methods and architecture among theorists in the field of art and architecture indicate a change in the construction process and the move from indigenous architecture to academic architecture. However, many theorists believe that the concept of culture is influential not only in the perception of people, beliefs, values, norms, customs and behaviors, but also in the design of artificial objects and environments, including houses and neighborhoods (Triandis, 1994: 12-22 Malkawi & Al-Qudah, 2003: 25-48; Altman & Chemers, 1980: 335-394). For instance, in an Islamic society, a major part of the spatial structure of houses

is in strengthening Islamic principles and values corresponding to it (Zafarnavai, 2017: 71) and the spatial structure of Islamic architecture, reflects both Islamic values and its essence. Thus, the spatial configuration of the house, its interior design (spatial organization) and the shape of the houses in an area can support or disrupt the culture of the inhabitants (Ozaki, 2002: 107-110; Rapaport, 1969: 49-50). One of the most important aspects of residence is the possibility of gaining identity during life due to the acculturation of the residential body. Since part of the individual identity is formed in the personal residence, it is imperative to pay attention to the characteristics of the residence (Tavakoli Kazeruni and Kashmiri, 2017: 115). This role increases the need to examine indigenous architectural patterns, their potential advantages and disadvantages. Therefore, the pattern of space organization and its configuration should be examined in order to understand the relationship between the design of built spaces and the subsequent cultural dimensions. With these interpretations, the study of the effect of residence culture (lifestyle and resulting behavioral customs) and social culture (social relations, kinship relations, family structure, etc.) on the formation of the form and spatial organization of indigenous houses is a matter for consideration. Studies show that paying attention to the impact of socio-cultural issues on architecture is a topic that many theorists in this field have addressed (2004, 19; Robbins, 1984: 175 Rapaport, 1999: 52-64; Oliver, 2006: 231- 503; Hohmann, 2005: 11; Said, 2001: 41; Baydar).

A review of the research background shows that so far no independent research has been done on the issue of continuity and change in the spatial configuration of native houses in Shiraz, from the Zandieh era to the contemporary period using the method of space syntax. However, some researches have been done in the field of Islamic art that based on the method of space syntax has studied the relationship between social and human values and their reflection in Islamic architecture, among which can be a study entitled "Analysis of social-human relations in mosque spaces. Qajar Qazuni schools based on the approach of space syntax ", pointed out that the authors during this study have concluded that values and social relations have had a great impact on the design of Islamic architecture (Soheili and Arefian, 2016: 475). The present study entitled: "Syntax reading of continuity and change in the spatial configuration of native houses in Shiraz, since the Zandieh era, using quantitative software data (Ucl Depth Map), has tried to read the spatial organization of native houses of the old texture of Shiraz and use to find the strengths and weaknesses of space syntax software through qualitative and quantitative analysis and examine the impact of lifestyle on this change and continuity in order to extract a suitable model in terms of socio-cultural concepts involved in archetypes and combine them. With today's demands for modern living patterns, it has become a prelude to the future homes of Iran's historic cities. In order to achieve these results, the research method is a combined method. Descriptive, analytical and finally logical reasoning methods have also been used. Correspondingly, in describing the steps and process of conducting the research, the tools of library studies, observation, field perception, interview and questionnaire, simulation and comparative analogy have been applied.

The work process began with the collection of samples (indigenous houses in the place and time mentioned in the research). The "theoretical sampling" method was used, because the collection of samples, unlike quantitative methods, aims to clarify the details and the type of relationship between the concepts and central categories of research. In order to achieve theoretical saturation in qualitative research, there was a need for categorization, so the typological method of architecture was used. In this regard, all the houses left over from the studied periods were initially observed and surveyed for sampling and theoretical saturation and the outlook included their classification based on typological technique. After selecting samples from historical periods using typology and theoretical saturation method, the

samples have been analyzed and evaluated by specialized software of space syntax. From the comparative analogy of the findings obtained from the tables and diagrams of space syntax and the results extracted from the interviews and questionnaires which are presented in the form of comparative tables and profiles of spatial value, the findings are discussed and finally the results are expressed. To obtain quantitative data, the spatial area has been used as a case study of the old texture of Shiraz. The old historical and cultural area of Shiraz with an area of approximately 378 hectares includes a part of the central area of Shiraz, which today forms the eight municipal districts of Shiraz. In addition to being the primary nucleus of the city of Shiraz, this region currently has many central commercial, religious, service and administrative activities and actual and potential for the growth of tourism, pilgrimage, trade, cultural activities.



نام محله	مساحت(هکتار)	مساحت(درصد)	جمعیت	جمعیت به درصد
پالا کفت	۵۹	۱۶	۱۳۰۲۵	۲۲
لب آب	۳۲	۹	۶۶۹۴	۱۱/۲
سرزدک	۴۴	۱۱	۶۴۱۰	۱۰/۴
سنگ سیاه	۵۴	۱۴	۴۶۹۴	۷/۸
اسحاق بیگ	۵۱	۱۳	۸۹۸۹	۱۵/۱
درب شازده	۵۳	۱۴	۱۰۴۱۷	۱۷/۸
میدان شاه	۴۷	۱۲	۵۸۵۹	۹/۸
درب مسجد	۳۸	۱۱	۳۵۵۰	۵/۹
مجموع	۳۷۸	۱۰۰	۵۹۴۳۸	۱۰۰

Image. 1 - Map of urban areas of Shiraz

Table No. 1 - Historical context neighborhoods of District 8 of Shiraz

Sang-e Siah neighborhood is one of the neighborhoods in the eight cities of Shiraz. This neighborhood is located in the southwest of the historical context of the city and has an area of about 54 hectares. To better understand the subject and also the syntactic reading of Shiraz native houses using Ucl Depthmap software, an architectural body adapted to the system of behaviors should be prepared based on field studies as well as houses left from different periods according to the statistical community, and in format. DXF is saved, which is presented separately below.

Conclusion

The study of the components of syntactic reading of the space organization and the physical configuration of the historical periods of Shiraz from the Zandieh period to the contemporary period in specific formulations reflected in Figures 1 to 5, shows the continuities and changes in these components. One of these developments in the space organization in the contemporary period compared to the previous periods studied in the present study is the issue of privacy and attention to it in the space organization of the house in the contemporary period. Contemporary houses in Shiraz are mostly built as houses with a mass on one side of the yard (apartment) and houses with a yard around the mass (villa); So the first entity that is most overlooked is the issue of privacy, which has been completely removed from the configuration and spatial organization of today's homes. The second obvious change is the lack of attention to the yard and its role in expanding people's social interactions. The courtyard, as the center of social interaction in the past historical periods of Shiraz, has a very weak position in today's houses, and the change in this situation in today's house has been removed or separated from the spatial configuration of the Iranian

house over time. Another change is the change in nature such as the relative depth from the position of service spaces to the position of the main spaces, which has been done due to the influence of Western culture as well as the problems of urbanization and land segregation. Changing the status of introversion in Iranian homes to extroversion rooted in Western culture, modernity and its technologies. As stated in the analysis of Figure 4, the fundamental change in reducing the spatial connection and increasing the interconnectedness in today's apartment houses has caused the separation and disintegration of the modern architectural body from its past nature, which with a little prudence in physical solutions and strategies Align the item with its previous body. As stated in the analysis of Figure 5, the persistence of an attitude - extroversion derived from Western culture in the Pahlavi period - in the physical nature of the house has remained intact and unchanged in view of today's needs, which are the common concern of the masses. This indicates the replacement of Western culture with the original Iranian culture, where change is needed to the maximum and where change is not necessary; It moves very intuitively according to the body of the architecture. According to the analysis and the results obtained with the help of Space Syntax software, in a completely academic and quantitative manner, a new reading of the way of social interactions in the spatial configuration of Shiraz native houses in different historical periods was performed. And the spatial configuration of those houses was identified in different historical periods. Now, based on this change and continuity, it is possible to explain the configuration based on lifestyle and system of behaviors and design it in a purposeful way for today's homes. This is an issue that today overshadows many social concerns about the impact of abnormal behaviors on the body of architecture, and appropriate patterns can be identified from the body of spatial configuration of architectures in different regions of Iran or even different countries. The behavioral system of the people established a special area in order to prevent social anomalies affected by inappropriate architecture. On the other hand, by reading the syntactic spaces of past architectural spaces, social interactions influenced by the body of architecture can be quantified so that they can be studied more carefully under different social studies for different applications and different sciences to optimize sustainable space organization with social environment.

References:

Ahmadi Zavieh, Seyed Saeed, Golestan (2018) "Seljuk era, the bedrock of the reproduction of the Sassanid system and structure, a case study: re-reading the Seljuk use of the structural system of Sassanid architecture", *Quarterly Journal of Islamic Art Studies*, No. 31, 113-81.

Bell, Simon and Rismanchian, Omid (2010) "Practical knowledge of space arrangement in understanding the spatial structure of cities", *Journal of Fine Arts, Architecture and Urban Planning*, No. 43, pp. 56-49.

Bell, Simon and Rismanchian, Omid (2011) "Study of spatial separation of worn tissues in the structure of Tehran by space arrangement", *Bagh Nazar*, No. 17, pp. 80-69.

Tavakoli Kazeruni, Mehdi, Kashmiri, Hadi (2017) "Assessment of architectural components with emphasis on Iranian architecture", a case study of Shiraz, *Quarterly Journal of Islamic Art Studies*, No. 66, pp. 120-105.

Soheili, Jamaluddin, Arefian, Ensieh (2016) "Analysis of social-human relations in mosque spaces - schools of Qazvin Qajar period based on the approach of space syntax", *Quarterly Journal of Human Geography Research*, No. 3, 491-475.

Yazdanfar, Abbas, Mousavi, Mahnaz and Daqiq, Hanieh Zargar (2008) "Analysis of the spatial structure of the city of Tabriz in the fortification area using the Space Syntax technique", *International Monthly of Roads and Buildings*, No. 67, pp. 69-58.

Zafarnavai, Khosrow (2017) "Study of the mystical concept of" empty space "in Islamic-Iranian architecture", *Quarterly Journal of Islamic Art Studies*, No. 27, pp. 74-57.

English sources:

Dawson, P.C. (2002): Space syntax analysis of Central Inuit snow houses, *Journal of Anthropological Archeology*, 4 (21), pp: 464-480.

Hillier, B. and J. Hanson, (1984): *The Social Logic of Space*, Cambridge University Press, New York.

Hillier, B. (1999): The Hidden Geometry of Deformed Grids: Or, Why Space Syntax Works, When it Looks as Though it Shouldn't. *Journal of Environment and Planning B*, 26 (2), pp: 169-191.

Hohmann, H. (2005): Culture of Memory and Maya Architecture: Architectural Documentation and Interpretation of Structure 1 of Chunchimai 3. *Journal of Anthropological Notebooks*, 11, pp: 103–113.

Hillier, B. (2007): Space and spatiality: what the built environment needs from social theory. *Journal of Building Research & Information*, 3 (36), pp: 216-230.

Jiang, B and C. Claramunt, (2002): Integration of Space Syntax into GIS: New Perspectives for Urban Morphology. *Journal of Transactions in GIS*, 3 (6), pp: 295-309.

Klarqvist, B. (1993): *A Space Syntax Glossary*. Nordisk Arkitekturforskning, Gothenburg.

Lima, J. J. (2001). Socio-spatial Segregation and Urban Form: Belem at the End of the 1990s, *Journal of Geoforum*, 32 (4), pp: 493-507.

Malkawi, F. and I. Al- Qudah, (2003): The house as an expression of social worlds: Irbid's elite and their architecture, *Journal of Housing and the Built Environment*, 18, pp: 25-48.

Montello, D. R. (2007): The Contribution of Space syntax To a Comprehensive Theory of Environmental Psychology, 6th International space syntax symposium, Istanbul.

Oliver, P. (2006): *Built to Meet Needs: Cultural Issues in Vernacular Architecture*, Architectural Press, London.

Rapoport, A. (1999): A framework for studying vernacular design, *The Journal of Architectural and Planning Research*, 16 (1), pp: 52-64.

Rapoport, A. (1969): *House Form and Culture*, Pearson, United States of America. 21. Robbins, E. (1984): Architecture and culture: a research strategy, *Journal of Design Studies*, 3 (5), pp: 175-177.

Said, I. (2001): Determining Cultural-ethnic Landscape in Terrace Housing Community in Peninsular Malaysia, *Universiti Teknologi, Malaysia*.

Wineman, J. and J. Peponis, and R. Dalton, (2006): Exploring, Engaging, Understanding in Museums, *Proceedings of the Workshop held in Bremen, Germany*.