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The Role of In-between Space Network in Creating Intra-City Dynamism by Focusing on the Neighborhood Centers in Hamedan City*

Melika Mottaghi[a]- Vida Norouzborazjani[b]- Mozayyan Dehbashisharif[c]- Seyyed Amir Mansouri[d]**

[a] Ph.D. of Architecture, Faculty of Architecture and Urban Planning, Central Tehran Branch, Islamic Azad University of Tehran, Iran.

[b] Assistant Professor of Architecture, Faculty of Architecture and Urban Planning, Central Tehran Branch, Islamic Azad University, Tehran, Iran (Corresponding Author).

[c] Assistant Professor of Architecture, Faculty of Architecture and Urban Planning, Central Tehran Branch, Islamic Azad University, Tehran, Iran.

[d] Assistant Professor of Architecture, Faculty of Fine Arts, University of Tehran, Tehran, Iran.

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ABSTRACT

The dynamism of space is always an opportunity to create a stronger relationship between place and society to develop urban life. Since the creation and development of intra-city areas, such as neighborhoods, can be significantly effective in the formation of dynamic social life, neighborhood centers can be revitalized as in-between spaces to provide services, create a sense of belonging to the place in the residents, and enhance the vitality of the neighborhood. The present study aims to investigate the physical, social, economic, and environmental roles of intracity in-between space systems in the dynamism of space using the TND approach. So, it seeks to answer the following question: what role do the characteristics of the in-between space play in the dynamics of neighborhoods and urban spaces? and with what approach can this be achieved? The present study is mixed method research where, first, the texture of neighborhood centers in Hamedan city is analyzed using logical reasoning and content-qualitative analysis, to extract the effective indicators in the dynamism of the neighborhood space. Next, the importance of coefficients and indicators is determined and analyzed using entropy and TOPSIS techniques. The results indicate that, based on the drivers of urban regeneration development, several components such as in-between space size, space syntax, the diversity of economic function, and the microstructures of socio-cultural life in the intra-city texture of Chaman play an increasing role in enhancing the vitality of neighborhoods and creating urban dynamism.

Keywords: In-between Space, Urban Dynamism, Dynamics, Neighborhood Center, TND.

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** E_mail: vid.norouz_borazjani@iauctb.ac.ir

1. PROBLEM STATEMENT

In today's neighborhoods, to a large extent, there is no platform for the voluntary attendance of people in public spaces. Since the symbolic sense of space emerges after the activity of people in small social areas, creating a robust intra-neighborhood network structure for people's social life seems to be one of the solutions to make the neighborhood space dynamic. The relationship between these two is an issue that has been raised in the relevant sciences, and experts are looking for the most effective way to overcome social crises and form civil life in the context of the city and neighborhood. Meanwhile, the city has become a place to carry out mandatory activities, and there is no space for exchanging information, pausing, and reflecting. But there have always been places for important social events and civic life throughout history, which have evolved. Therefore, the present study aims to redefine intra-city elements by focusing on the neighborhood centers in Hamedan city as in-between spaces to create a purposeful network structure to enhance intra-neighborhood dynamism. So, it seeks to answer the following question: what role do the characteristics of the in-between space play in the dynamics of neighborhoods and urban spaces? and with what approach can this be achieved? Since the old neighborhoods represent the cultural and historical identity of the cities and their destruction leads to the deterioration of the residents' identity, it seems necessary to preserve, organize, and revitalize them. Hamedan includes historical, luxurious, and valuable neighborhoods, which warrant the examination of its neighborhoods in terms of the presence of in-between space as a solution to enhance urban dynamism. These neighborhoods, due to their specific structural and social characteristics, were chosen as a pilot for regeneration and development catalysts for the first time in Iran (Sajadzadeh et al. 2015).

The present study examines how in-between spaces influence the dynamism of urban neighborhoods. This can be achieved by identifying the components of the dynamics of in-between spaces and their intervention scope. Nowadays, the creation of space dynamics is the main driving force forming cities, and the key to its success is to develop the city body at the same time. This equips cities to accept new functions or provide new services and enhances existing valuable functions.

2. RESEARCH BACKGROUND

In their study entitled " The role of regeneration in catalyst approach of ancient neighborhood (case study: haji neighborhood in Hamedan)", Sajadzadeh et al. (2016) have investigated the neighborhood revitalization and regeneration as well as the preservation of its historical and physical values to transform the neighborhood into a settlement compatible with modern life and in accordance with its character and historical identity in Haji neighborhood in Hamedan. In another research entitled "The role of urban design in regeneration of ancient district with catalyst approach, Case Study: Kalpa District in Hamedan", Sajadzadeh and Zolfigol (2016) has addressed the dynamics and revitalization of traditional neighborhoods, and investigated how the development catalyst approach influences the urban regeneration process in Kalpa District in Hamedan, as a case study. In her study entitled " The socio-cultural reproduction of urban spaces with the aim of promoting neighborhood identity (Case study: Sang Shir Neighborhood, Hamedan City)", Naderian (2017) has analyzed environmental qualities and socio-cultural aspects of urban neighborhoods to improve neighborhood identity and dynamism in Sang Shir Neighborhood in Hamedan. Gharavi Khansari, in her study entitled "From traditional neighborhood to contemporary neighborhood; A study on revitalizing neighborhood identity in contemporary city", has proposed the revitalization of neighborhood identity in contemporary cities in contrast to the physical revitalization of traditional neighborhoods, and provided the main opportunities and solutions for revitalizing the identity of neighborhoods and strengthening their sustainability considering the characteristics of traditional neighborhoods and the special conditions and needs of contemporary residential areas. In their research entitled "Developing P.P.P model of place attachment for evaluating residential environment (Cases Study: Open Space of Iranzamin and Ekbatan Apartment Buildings)", Habib and Yaghmaeian (2017) have analyzed the in-between space in the open area of Ekbatan and Iranzamin buildings based on the place model, focusing on the person, place, and process, and the model of the residents' place attachment to the in-between open space. In both case studies, the findings indicated that social attachment was much higher in such spaces. In the article entitled "Explaining the features of urban plazas for sustainable social development", neighborhood squares in the city and their role in the formation of a sustainable city have been investigated. The findings indicated that neighborhood squares (plazas) create different and deep functions and meanings in the neighborhood and encourage the local people to effectively attend in the region, thereby enhancing the sustainable life of the city (Cilliers et al. 2015). In Ohm et al.'s (2001) study on TND, the results showed that different modes of transportation in the neighborhood such as: walking, cycling, and cars are promoted. The use of narrow lanes and other traffic calming techniques help reduce traffic to increase pedestrian safety. In another research on smart urban growth, TND is defined as follows: a compact neighborhood with mixed residential, commercial, and office buildings

that are located in close proximity to each other. TND is a type of planning based on the principles of traditional small towns and the development of urban neighborhoods. TND is the renewal and modernization of past values in response to the inefficiency of uses and infrastructures in new urban developments. This approach aims to meet the diverse and different needs of people to form the identity of neighborhoods (Cilliers et al. 2015).

Since the TND approach emphasizes traditional and historical neighborhoods, in countries like Iran, which has preserved the treasure of some of its traditional neighborhood, it is a way to modernize these neighborhoods and to make them dynamic. However, no specific research has been carried out on the localization of this approach in Iran, while the previous research shows the effectiveness of using this approach in the traditional neighborhoods of Iran. For example, one can refer to the article entitled "Using the TND approach in planning lively neighborhoods" by Akhavan (2018). In a research entitled "Revitalization of historical neighborhoods to achieve sustainable urban development based on the TND approach", Nekouei et al. (2013) have conducted a study in Bidabad District of Isfahan city. In their research titled " The role of adaptive reuse in network of in-between spaces and intracity dynamism; Case study: Tehran Historic Houses", Mottaghi, Bourazjani, and Dehbashi (2021) have used the TND approach and the place model to address the role of historical house change in neighborhood dynamism. Therefore, it can be claimed that the present study has an innovation and seeks to find how the in-between space influences the neighborhood centers and to identify the components influencing the dynamics of the neighborhood network in Hamedan.

3. METHOD

The present study is mixed method research in which the qualitative phase was scrutinized and verified by its quantitative phase. In the present study, considering the conceptual compatibility of the approach indicators with the analytical codes of the grounded theory, this theory was applied. Therefore, first, in the qualitative phase, using the grounded theory, the in-between space assessment indicators were extracted. Next, the conceptual types of in-between spaces studied (Chaman) were identified, and the spaces were encoded and analyzed. In the next step, the extracted codes (indicators) were identified in the case studies. It should be noted that before developing the questionnaire and with the aim of validating the qualitative part of the research, the extracted codes and themes were approved by experts. Then, based on their opinions, the final indicators were selected, and finally, some questions were designed to connect the two qualitative and quantitative phases in this mixed method research.

The historical Chamans have been selected in such a way that they are located in different areas of Hamedan city. Case studies have been selected from a known range, and there were also sufficient documents to study them precisely. Therefore, their validity can be considered very acceptable, which can be defended based on the detailed study of the analyzed samples. The diversity of the analyzed projects is such that the obtained results can be generalized on a much wider scale. So, the achievements obtained can be applied in drawing the future of Iranian architecture.

In the present study, the required data were collected by interviews and questionnaires, as well as the analysis of existing concepts and theories on how to revitalize the studied neighborhoods. So, the data collection tools included objective observations, field studies, library studies, local conversations with businesses and residents based on selected indicators. After analyzing the neighborhoods and collecting the data using the abovementioned method, a 21-item questionnaire on four physical, social, economic, and environmental criteria was designed and provided to 30 experts, all of whom were active and educated in the urban area and residents of Hamedan city, and who fully knew the studied neighborhoods. The questionnaire was designed based on a five-point Likert scale and the results were presented as the average of the scores obtained for each neighborhood. Then, using the entropy weight and TOPSIS technique, the weight and effect size of each indicator was determined. Numerical statistics resulting from the entropy technique were analyzed with through a six-step process, and finally, the indicators of dynamism were screened. Finally, to validate the quantitative phase of the research, the dynamism indicators estimated for the case studies were investigated and the results were compared using the TOPSIS method. Considering different dispersion control coefficients, the results of the modified TOPSIS method, and the correlation coefficients obtained indicate that the six-step TOPSIS method used in this research was able to control outliers well.

4. RESEARCH FOUNDATIONS AND CONCEPTUAL FRAMEWORK

The conceptual framework is developed based on four main concepts.

4.1. The Concept of TND and the Need to Create It

One of the new postmodern movements in the field of urban planning and design in the last three decades has been the urbanism movement with the traditional neighborhood development approach. This approach focuses on urban neighborhoods and provides solutions to bring dynamism, vitality, and dynamics for the city structure. This charter does not reject the needs of modern and post-modern life,

but tries to meet them using physical, technical, etc. solutions suitable for human life and preserving the environment with emphasis on the forgotten place of man (Mahdavinejad 2014, 169).

The nature of urban regeneration can be summarized in six separate categories:

First, urban regeneration is an intervention activity. Second, urban regeneration operations are carried out with the joint activity of different social, public and private sectors. Third, urban regeneration is an activity that, along with economic, social, environmental and political developments, creates considerable changes in administrative structures. Fourth, urban regeneration provides collective mobilization and provides a basis for negotiations to find proper solutions. Fifth, the urban regeneration process is based on integration in the management of changes in urban areas. Sixth, urban regeneration requires the function of various elements of the urban system (economic, social, physical and environmental) based on the nature of urban regeneration (Farsi et al. 2019).

The goals of urban regeneration can be stated as follows:

- Physical goals: to solve the problem of physical exhaustion, expand living facilities in the city, develop local infrastructure, and promote architectural heritage (in historical cores) and city tourism (Collins and Collins 1965).
- Social goals: to attract educational and research institutions and organizations, reach the values and preferences of society and different social groups, reorganize mechanisms for the compliance of decisions with democracy (Thomas and Comitta 2010), provide the ground for further cooperation and participation, and pay attention to interactions between organizations and institutions and their internal relations (Anderson et al. 2017).
- Economic goals: to attract investment, create jobs, renew the city's economy, and improve wealth distribution (Ashtari and Mahdenjad 2014, 17).
- Environmental goals: to improve the environment, eliminate pollutions (Leng 2008, 256)

One of the solutions proposed in recent decades to improve the condition of neighborhoods is the TND approach. This approach revitalizes the neighborhoods with the solutions it provides and makes the attendance of people in the neighborhood permanent. The TND approach is a type of comprehensive planning system including different types of housing and uses within a certain limit. Administrative, educational, commercial, etc. uses are located at a suitable walking distance from residential areas. It is possible to choose walking, cycling, and using vehicles for residents. In this type of neighborhood, public and private spaces have the same value. Administrative (civil) buildings of the city and urban spaces such as plazas, parks, and squares enhance the identity and value of the neighborhood. The TND approach refers to the design of traditional neighborhoods based on the human scale, and the revival and modernization of past values in response to the ineffectiveness of uses and infrastructure in new urban developments (Duanny and Plater-Zyberk, 2010).

The TND refers to the compact development of neighborhoods or cities based on the principles and foundations of traditional city planning. This type of development can include intra-city developments and reuse of existing buildings, or it can be newly created on undeveloped land. TND projects include different types of housing, interconnected streets and blocks, public spaces, and facilities such as shops, schools, and worship places between which people can move on foot. The scale of these projects is a neighborhood or a city and they should not be mixed with new urbanism in terms of scale. It is noteworthy that TND uses different architectural styles in design, and the development of traditional neighborhoods does not mean the oldness of this approach, but it means using the values and norms of the past and modernizing them in new urban developments. By emphasizing neighborhoods as the core of the city, the TND approach is considered one of the tools applied to form neighborhoods based on a predetermined order and plan Therefore, it seems necessary to use this approach as a solution that regulates the physical, social, and cultural environment at the neighborhood level (Cilliers et al. 2015).

4.2. The Concept of Dynamism in Urban Space

This term dynamism, in its simplest sense, means dynamics and self-movement (Amid Dictionary). In philosophy, each of the philosophical theories that consider the material phenomena of the world as the result of the action of various forces is related to dynamism (Rauh 2015).

Social dynamics (or dynamic community) can refer to the behavior of groups that results from the study of the relationship between individual interactions and group-level behaviors (Loktionov 2019). Urban dynamism is a wide range of interwoven relationships that have played a role in this research and in addition to the efficiency of social and cognitive processes, it has led to the development of activities affecting human behavior in relation to the surrounding environment.

Urban dynamism brings together ideas from economics, sociology, social psychology and other disciplines in the urban domain. These ideas are a subset of complex adaptive systems in the eclecticism of perceptual relations. The basic assumption is that people are influenced by the behavior of each other and the environment in the dynamism of the environment (Rauh 2015).

In the people-centered sociological perspective, the dynamism of the urban space is emphasized and it is believed that the cities are primarily related to the people and that the people, along with the social

and functional characteristics of specific urban environments, can cause urban dynamism (Shahbazi et al. 2020). One of the spaces that, according to this research, can lead to this importance, is the in-between space with intra-neighborhood emphases. Dynamism works in intra-network functional structures effectively. Therefore, the present study consciously uses this robust function to create an effective network in the intra-neighborhood structure.

4.3. The Concept of In-between Space System

In 2001, Hajer and Reijndrop coincided the term in-between spaces and stated that these spaces can be used as interface spaces if they connect different activities and relationships in a way that they generatevalue (Carmona 2010). Also, this term is used to describe the lost and absent spaces between physical forms in urban spaces (Piccinno and Lega 2013). According to Osoria, in-between spaces are the remaining spaces that are unplanned and known as a platform for creating insecurity, which ultimately lead to physical and social problems in the urban structure (Osoria 2012). If these spaces are used effectively, this characteristic of them will be controlled.

In social and cultural studies, the term "in-between spaces" is mainly coordinated with the prefix "inter", which indicates the overlap of, connection, and correlation between different components (Luz 2006). Urban in-between spaces can be qualitatively divided into continuous spaces and discontinuous spaces; Contiguous spaces are those spaces located within a specific area such as a building and are regularly connected with other spaces. Discontinuous spaces are those that have diverse physical conditions, exist mostly in urban open space, and are not regularly connected with other structural components in the city (Carmona 2010). Discontinuous in-between spaces include lost spaces (rooftops and spaces under buildings) and spaces with two uses (unclear spaces and those enclosed by the edge of buildings) and continuous in-between spaces refer to spaces within an area (pause spaces between buildings and spaces in front of buildings). Therefore, in this discussion, in-between spaces are of discontinuous type.

Jan Gehl introduces the in-between space as an intermediary space with a mutual function. This space does not have an independent shape and personality and is considered a space to adjust the connections between spaces. In other words, this space does not have its own borders and is defined by the spaces on its sides. When this space is opened, it provides the possibility of social, cultural and natural exchanges (Fardpour, Dolatabadi, and Mahdavinejad 2021).

In-between space is a system between two specific events or spaces and is often considered a connection between two ends and a joint between two spaces (Hudson and Shaw 2012). These joints include small and large-scale places, public and private spaces, and built and unbuilt spaces that have intermediate and pause functions (De Smet 2012). In-between spaces include influential systems such as the spaces between buildings, building blocks, and urban areas. These spaces mostly exist between two buildings or in front, on sides or back of buildings (Hudson and Shaw 2012). This system has a structure beyond space and refers to the spatial hierarchy and network of connections within the environment (Carmona 2010). Regardless of the name assigned to the in-between space by the researcher, the structure of the relationships of this system is multiple, making the system to grow. The accumulation of this growth and influence in the structure of the city in the cycle of social relations leads to dynamism in the intra-neighborhood network.

4.4. Components Affecting the Creation of Intra-neighborhood Dynamism

In this article, the TND approach, as an intervention method and a point at which the two concepts of public places of neighborhoods and in-between spaces are connected, was proposed for the revitalization of neighborhoods. In this method, the indicators raised in the dynamics of traditional neighborhoods were examined based on the integration of the TND approach and the dynamics of the in-between space and the most effective indicators in terms of the ability to create vitality were extracted. These indicators are categorized in four structural-physical, economic, socio-cultural, and environmental dimensions. Figure 1 shows the components affecting the vitality of the in-between space in the neighborhoods.

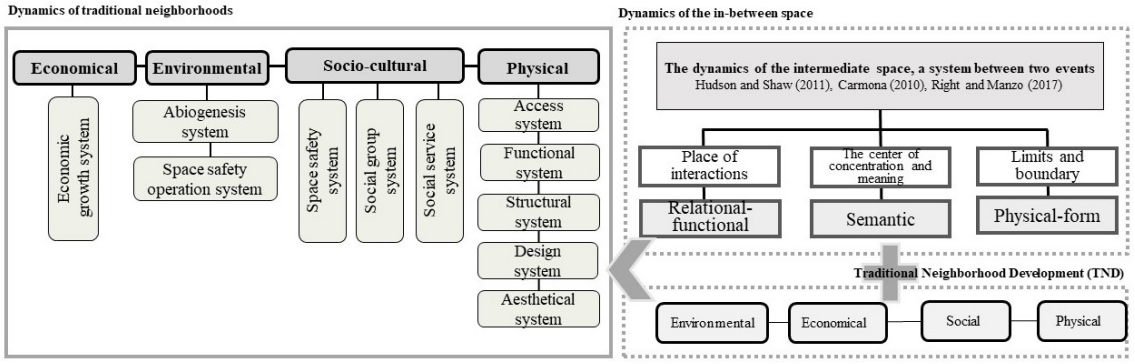

Fig. 1. Components Affecting the Vitality of the In-between Space in Traditional Neighborhoods

Table 1 also presents the criteria for measuring the dynamics of the neighborhood center based on the TND approach.

Table 1. Criteria for Assessing the Dynamics of the In-between Space of Traditional Neighborhoods with the TND Approach

Physical Dimension			
Component	Criteria	Component	Criteria
Access system (Relph 2010) (Lynch 2002) (Rahman and Jomes 2016)	Suitable access system, suitable openings	Structural system (Schultz 2005) (Veal 2020) (Rauh 2014)	The form structure of the place
	Presence of parking		Hierarchy
	Exterior-interior communication		Transparency of public and private space
	External com		Dimensions of space and human scale
	Routing in the overall structure		Spatial logic
			Enclosure
		Space design system (Hall 2005) (Jacobs 1961)	Variety of facade patterns
			Variety of spatial patterns
			Variety of the geometric pattern of common borders

Environmental Dimension	
Component	Criteria
Environmental-biological system (Newman 2008)	Attention to the specific climate of the region
Abiogenesis system (Alexander 2011)	Using living structures in creating space

Socio-Cultural Dimension		Economic Dimension	
Component	Criteria	Component	Criteria
Social service system (Whyte 2013) (Habibi 1999) (Lane, Videira, and casanova 2019)	Provision of micro-scale services	Economic growth system (Madanipour 2005)	Design for a growing economy
	Attention to social needs		Attention to investors
Social group system (Madanipour 2012)	Cultural richness and social mixture of groups		

5. RECOGNITION AND ANALYSIS OF THE CASE STUDY

The two main fields in the recognition and analysis of the case study are typology and introduction of the studied Chamans.

5.1. The Historic Fabric of Hamedan City and the Recognition of the Selected Neighborhood Centers

Hamedan has an ancient history, which is due to its natural location, this geographical situation has turned Hamedan into a permanent residential center since long ago (Habib 2007). The number of neighborhoods and neighborhood centers with buildings such as mosques and public buildings are clear signs of the social situation and architectural structure of the neighborhoods. Figure 2 shows the neighborhood demarcation system in Hamedan city and the position of the selected neighborhoods relative to each other.

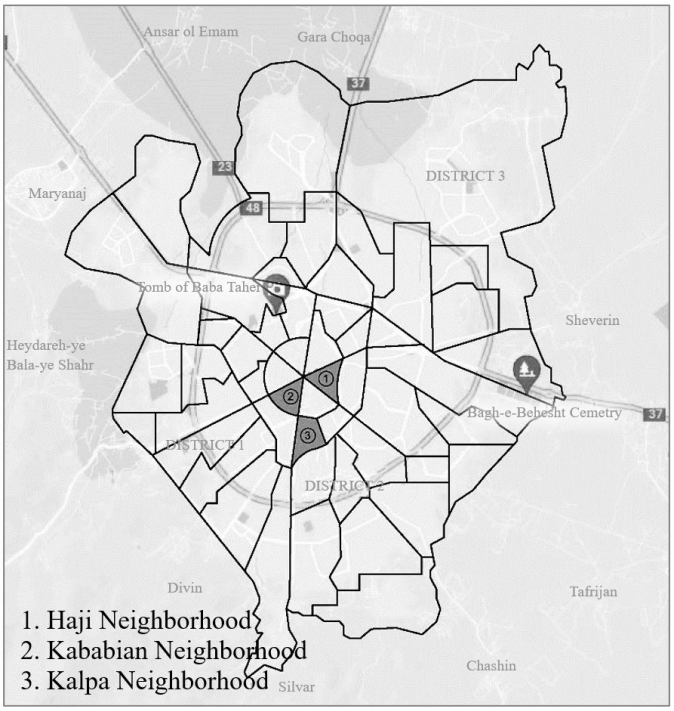

Fig. 2. Location of the Studied Neighborhoods in Hamedan City

In this research, five neighborhoods were identified among the traditional neighborhoods in Hamedan city. Then, based on the traditional neighborhood development approach, three old Hamedan neighborhoods named Haji, Kababian and Kalpa, which are located in the center of Hamedan city, were selected from among the samples. Most of the remaining Chaman in Hamedan has been destroyed. These three neighborhoods are the only Chamanes that continue their semi-living life with relative changes. In Figure 3, photos of the center of these neighborhoods can be seen. The influencing factors in how this separation is done are:

1. The field of urban planning: a- being an indicator of the neighborhood, b- having an active neighborhood center.
2. The field of effective factors in design: (a) employer, (b) public reception, (d) cultural landscape.
3. The field of decision-making: (a) interdisciplinary approach and group performance, (b) participation, (c) flexibility.

The distribution of the center of historical neighborhoods has been chosen in such a way that they are located in different historical neighborhoods of Hamedan city.

Fig. 3. Right to Left, Haji Neighborhood, Kalpa Neighborhood, and Kababian Neighborhood

In the past, there were square, rectangular, trapezoidal or non-geometrical areas in many neighborhoods of Hamedan, where the main street of the neighborhood led. These areas, which were called "Chaman", were the center of gathering and the beating heart of the neighborhoods (Saeidi et al. 2011). The initial progress along with the change process of Hamedan neighborhoods and Chamans as well as the structuring of Hamedan city are shown in Table 2.

Table 2. The Evolution of Chaman in Hamedan Urban Development in Different Periods

No.	Period	Changes in Urban Fabric	Changes in Chamans and Neighborhoods
1	First Century A.H (Arrival of Islam)	Change from "hilly areas and rocky heights" to "Rabaz", i.e. the main area for settlement	The beginning of the formation of neighborhoods including: Armenians, Assyrians, Jews, and Muslims (yaghmaeian and Habib 2017)
2	Umayyad and Abbasid	The beginning of neighborhood bordering and fundamental changes in the texture of the area, new fencing	The gating of neighborhoods, the presence of Chaman with a completely independent form structure (Zarei 2012, 66)
3	Safavid	The core of the city: market and mosque Cultural and religious centers: Cemetery and Imamzadeh holy shrine Commercial centers: seasonal markets Bath and arcade	The boldness of transportation routes includes: Chaman, alley and neighborhood (Azang 2009, 40)
4	Late Qajar, Early Pahlavi	The transformation of alleys and quarters into new streets	The deterioration of most of the Chamans and organic textures. Preservation of the structure of the remaining Chamans such as: Baneh Bazaar, Vardabad, Mehtaran, Varmazyar, Majdabad etc. (Ibid., 41)
5	Pahlavi II	6 axes in the form of concentric circles Carl Friedrich Gauss, Austria Axes: Bu Ali, Abai Abad, Pahlavi, Baba Taher, Ekbatan, Sang Shir	Destruction of the geometry of the neighborhoods, especially the Chamans Referral of people from Chaman to the new urban areas to meet their social, cultural, economic and environmental needs (Zarei 2012, 68)
6	1980 Onwards	The peak of urban construction The transformation of farms and greenery to residential use	Destruction of remaining Chaman The perishing life of some Chamans such as Haji, Kalpa, Kababian Chamans (Sajadzadeh and Zolfigol 2015)
7	Present	The development of traditional fabric restoration plans, Revitalizing the remaining Chamans, Paving six main axes from the city center to the central ring	Inappropriate urban measures and changes in the texture of the few remaining Chamans (Ibid, 57)

The Chamans in Hamedan city represented an efficient space with a neighborhood center structure. A built-in network that helps the growth of activities within the neighborhood in terms of social, cultural and economic and provides dynamics in the inner city area. Among the characteristics of the Chamans left in the years 1300 to 1330, the following can be mentioned: It has an open and wide space for socializing and interactions, an aqueduct and a fountain and a way to access it, a place for elders to gather and hang out, permanent and seasonal markets, side roads. and the main movement, special space for important daily events, landscaping and tree planting (Zalnejad et al. 2018).

5.2. Typology of Studied Chamanes in Hamedan Localities

Now only a few Chamanes remain, including Haji and Kalpa Chamans, a part of Kababian Chaman and a few parts of Aghajani Bey Chaman (Rafiean et al. 2016), which in the present research, after the typology, a brief introduction of case examples is given.

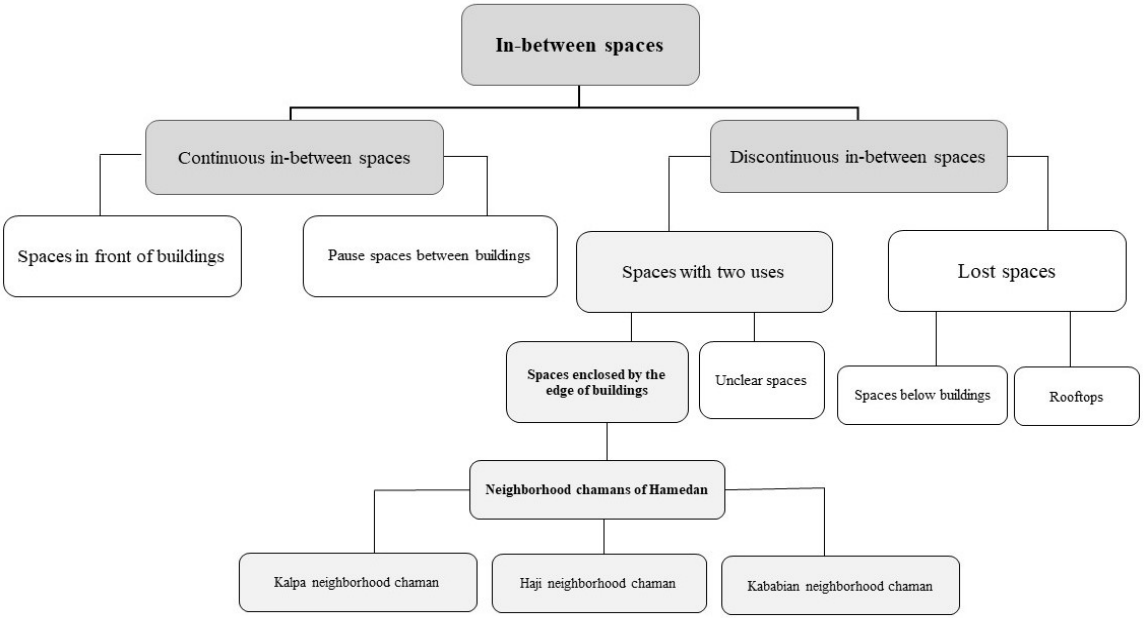

Fig. 4. The Typology of Studied Chamans in the Structured Divisions of the In-between Space

The current conditions of Haji neighborhood and its neighborhood center are shown in Figure 5. The mosque, bathhouse, shopping malls and green space are the main elements of this neighborhood.

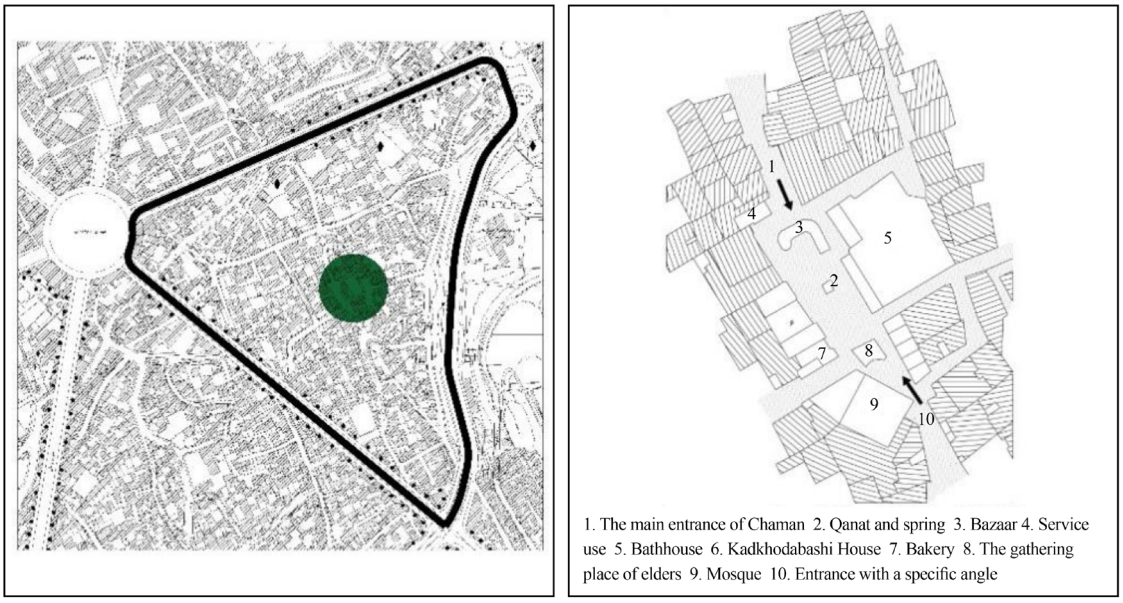

Fig. 5. Right: the Internal Components of the Haji Chaman. Left: Haji Neighborhood Center with an Emphasis on the Neighborhood Chaman (the In-between Space of the Neighborhood).

Figure 6 shows the current situation map and photos of the Kalpa neighborhood, the Kalpa neighborhood dates back to the late Qajar period and has a texture that has undergone many changes in the past. The sphere of influence of this neighborhood is defined by the streets that cover it. The commercial walls and also the new residential texture are sitting next to the old textures in the neighborhood (Sejadzadeh and Zolfi Gol 2014).

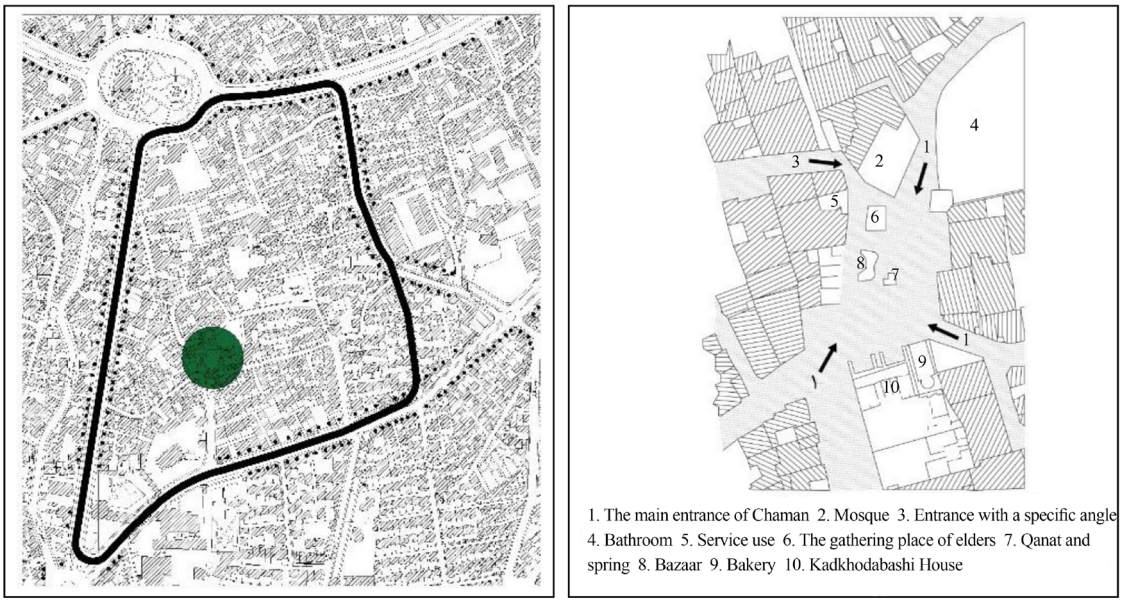

Fig. 6. Right: the Internal Components of the Kalpa Chaman. Left: Kalpa Neighborhood Center with an Emphasis on the Neighborhood Chaman (the In-between Space of the Neighborhood).

Figure 7 shows the current situation map and photos of Kababian neighborhood in Hamedan city, which is located in the first belt ring of the city. This neighborhood is one of the oldest remaining neighborhoods of Hamedan's historical context, which is located near the market and the central square of Hamedan city and dates back to the late Qajar period (Sejadzadeh and Zolfi Gol 2014).

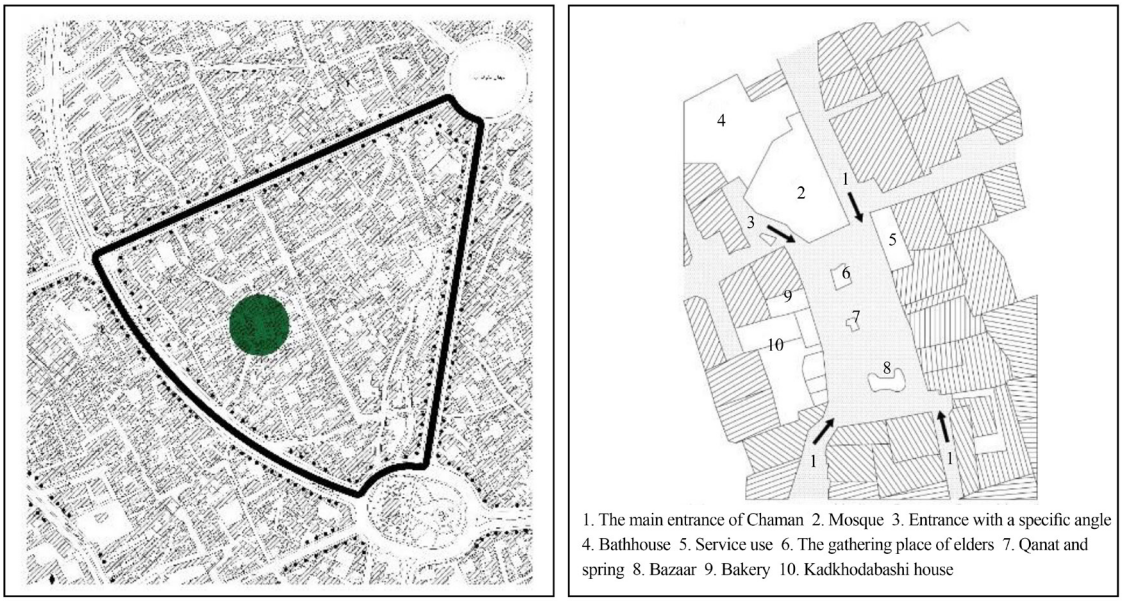

Fig. 7. Right: The Internal Components of the Kababian Chaman. Left: Kababian Neighborhood Center with an Emphasis on the Neighborhood Chaman (the In-between Space of the Neighborhood).

6. FINDINGS

The present study analyzed the content of the studied context by using the method of logical reasoning in order to determine how the in-between spaces in the Iranian architectural and urban planning system led to the creation of a dynamic system, and on the contrary, nowadays, the problems of the system of the context have arisen with the destruction of these layers. For this purpose, using the qualitative research approach

after extracting the components, measures and micro-measures of physical, social, economic, and environmental indicators in Chaman (the public space of the neighborhood with an emphasis on the identity of the neighborhood), scoring each of the measures using the experts' opinion, through Five-stage Likert is done, then the importance of the coefficients is done by the entropy method and the indices are calculated by the TOPSIS technique.

The survey questionnaire provided experts with physical, social, economic and environmental indicators in the in-between space of the neighborhoods, emphasizing its dynamics. In this research, 30 experts expressed their views and opinions. The overview of the range of experts participating in the research is presented in Table 3. In the following, the average points provided by the experts in the field of each of the parameters in the studied localities of the research are presented.

Table 3. Demographic Characteristics of Experts Participating in the Research

Gender		Education			Age		
Female	Male	Bachelor	Master	Ph.D.	30-40 years	40-50 years	50-60 years
12	18	15	10	5	5	15	10

6.1. Analysis of Data based on Shannon Entropy Method and TOPSIS Technique

First, the results obtained from the data resulting from the Likert scoring and its data were used and used in the main method of calculations. The numbers obtained from the five-point Likert scale were used in the Shannon entropy method. Then the weight (importance) of the research factors was calculated. In this way, the decision matrix is formed first, which is the evaluation of three neighborhoods based on physical, social, economic and environmental criteria, which is determined by the normal decision matrix and using the formula relationships of the weight of the indicators.

In TOPSIS technique, after forming the decision matrix and normalizing this matrix, the balanced normal decision matrix is formed. The next step is to form the weighted normal matrix based on the weight of the criteria. Therefore, criteria weights should be pre-calculated using a technique such as AHP or Shannon's entropy. Calculating the positive ideals +) (di and negative -) (di is the next step. In this step, a positive ideal and a negative ideal are calculated for each index. The distance from the positive and negative ideals and the calculation of the ideal solution will be. Finally, the degree of closeness The relative proximity of each option to the ideal solution is calculated. Finally, the relative closeness of each option to the ideal solution is calculated from the following formula. It should be noted that the value of Cl is between zero and one. The closer this value is to one, the closer the solution is to the ideal solution and the better solution.

$$d_i^+ = \sqrt{\sum_{j=1}^{n}(v_i j - v_j^+)^2} \qquad d_i^- = \sqrt{\sum_{j=1}^{n}(v_i j - v_j^-)^2} \qquad cl_i = \frac{d_i^-}{d_i^- + d_i^+}$$

In the next step, using the six-step TOPSIS method, three research neighborhoods will be ranked. First, the decision matrix of the TOPSIS method is formed, which is the same as the decision matrix of the Shannon entropy method. Based on this, in terms of the four dimensions of research, Haji neighborhood center has won the first rank. The center of Kelpa neighborhood and Kababian neighborhood are the second and third priorities.

Table 4. The Final Score and Rank of Neighborhood Centers in Physical Criteria

	Distance to the Positive Ideal	Distance to the Negative Ideal	Final Score	Rank
Kalpa Neighborhood Center	0.119	0.105	0.467	2
Haji Neighborhood Center	0.083	0.141	0.629	1
Kababian Neighborhood Center	0.154	0.082	0.347	3

The final score (i.e. Cl) is between zero and one. The closer this value is to one, the closer the solution is to the ideal solution.

Table 5. The Final Score and Rank of Neighborhood Centers in Social Criteria

	Distance to the Positive Ideal	Distance to the Negative Ideal	Final Score	Rank
Kalpa Neighborhood Center	0.104	0.073	0.413	2
Haji Neighborhood Center	0.000	0.163	1.000	1
Kababian Neighborhood Center	0.163	0.000	0.000	3

The final score (i.e. Cl) is between zero and one. The closer this value is to one, the closer the solution is to the ideal solution.

Table 6. The Final Score and Rank of Neighborhood Centers in Economic Criteria

	Distance to the Positive Ideal	Distance to the Negative Ideal	Final Score	Rank
Kalpa Neighborhood Center	0.155	0.022	0.127	2
Haji Neighborhood Center	0.057	0.105	0.647	1
Kababian Neighborhood Center	0.023	0.155	0.869	3

The final score (i.e. Cl) is between zero and one. The closer this value is to one, the closer the solution is to the ideal solution.

Table 7. The Final Score and Rank of Neighborhood Centers in Environmental Criteria

	Distance to the Positive Ideal	Distance to the Negative Ideal	Final Score	Rank
Kalpa Neighborhood Center	0.127	0.000	0.000	2
Haji Neighborhood Center	0.000	0.163	1.000	1
Kababian Neighborhood Center	0.104	0.003	0.013	3

The final score (i.e. Cl) is between zero and one. The closer this value is to one, the closer the solution is to the ideal solution.

7. DISCUSSION

In order to better communicate with the environment and more responsible supervision of the space, it seems necessary to consider a combination of areas in the design of neighborhoods as the in-between public space in which the life of the city flows. As it can be seen from the investigations carried out on the case example of Chaman (node or social square), these squares have had a suitable functional pattern over the years in terms of physical and mental territory in Hamedan neighborhoods, and in addition to the existence of real ownership of the fields, which indicates the monitoring and control of the space. symbolic ownership in the public space by predicting a living and attractive space, intensifying the use of public space, strengthening social connections for the residents of the neighborhoods over the years, and by increasing the sense of belonging to the environment, their sense of responsibility in the optimal use of the space and participating in It has strengthened collective activities. Determining the physical sanctity of the neighborhood by designing bodies, natural barriers, passages and uses and paying attention to the entrances of the neighborhoods in Hamedan and considering the appropriate and compatible uses for the relative self-sufficiency of the Chamans has strengthened the neighborhood center (Chaman) and predicted calm and pedestrian access from all The points of the neighborhood and paying attention to the type of accesses and their hierarchy are among the things that have created a favorable, coherent and meaningful environment for its residents over the years, and finally by creating ring roads and dead ends, as well as promoting alleys in the scale of the neighborhood, which is a narrow and traditional thoroughfare. It has increased pedestrian access in addition to providing the needed privacy and peace. This research shows that the quality of the in-between space in neighborhoods (the center of neighborhoods) has a direct effect on the level of vitality and dynamism in the neighborhood. Therefore, Chamans are centers that, with their special characteristics, encourage the people of the neighborhood for social communication and cause the selection of optional activities in the neighborhoods and create a stronger intra-city network in terms of urban dynamism.

In Table 7, the evaluation of dynamics in three case

sample neighborhoods has been summarized based on indicators and criteria of dynamics and spatial dynamism. Based on the results of this research and the opinions of experts, the Haji neighborhood center has a more stable spatial dynamism than the other two neighborhood centers.

Table 8. The Final Scores and Ranks of the Neighborhood Centers Obtained from the Six-Stage TOPSIS

Neighborhood	Final Score	Rank
Kalpa Neighborhood Center	0.467	2
Haji Neighborhood Center	0.629	1
Kababian Neighborhood Center	0.347	3

In fact, it seems that the neighborhood of Haji, due to the placement of various cultural and social uses in it and the predominance of social and popular activities due to the homogeneity of its residents, emotional ties to the house and neighbors, and groups and human communities in the neighborhood, is a higher social and cultural concern than It has similar characteristics to other studied localities in Hamedan city, and for this reason, it has more flexible and prominent development drivers that have a more flexible and prominent socio-cultural and physical perspective. Based on this, the results of this study show that the various aspects of TND and urban regeneration measures that stimulate development can create a sense of participation and cooperation of its residents in helping to advance projects as best as possible due to the trust and credit that residents have from each other and the emotional relationships between them. It has increased and led to the reproduction of social interactions with the infrastructure of urban and intra-regional dynamism and also brings more security to the neighborhood. Neighborhood centers as an effective in-between space consolidate the neighborhood's dynamism and vibrancy. Since most of the relations were only within the neighborhood, it has a kind of regional independence and provides the daily needs of the residents and to some extent local employment. Therefore, the neighborhood had relative independence from different social, economic and physical aspects. Institutions and service and social equipment are physically located in sensitive points by defining the in-between space (neighborhood center). The above-mentioned in-between spaces became more prominent with the definition of the neighborhood center and physically they were placed either in the form of a wide row or in the form of squares that were often located at the intersection of several main roads of the neighborhood. One of the defining characteristics of the neighborhood center is the creation and development of in-between spaces as a communication solution in the intra-city network, which is important in Haji neighborhood due to its suitable spatial location, favorable enclosure and strong centers in this Chaman, making this intermediate space the chosen space.

In the continuation of the analysis, with a return to table 2 and the results that made Haji neighborhood the chosen neighborhood in statistical calculations.

After obtaining the results, by referring to the tables of Haji neighborhood, the importance coefficients of the indicators were checked, and among them, according to the degree of deviation of each index (di), Table 7 is presented with the content of the screening of the indicators that are effective in the dynamics of the best neighborhood, namely Haji neighborhood.

Table 9. Grading of the Top Indicators (Higher Importance or Greater di) of Dynamics in the In-between Space of "Haji Neighborhood"

No.	Top Indicators (Top Criteria)	System	Structural Dimensions based on the TND Approach	di
1	In-between Space size and Dimension	Structural System	Spatial-Physical	0.94
2	Appropriate Physical, Visual, and Movement Access	Access System	Spatial-Physical	0.91
3	Space Syntax	Spatial Logic	Spatial-Physical	0.73
4	Favorable Enclosure	Enclosure	Spatial-Physical	0.69
5	Suitable Places to Rest	Service	Socio-Cultural	0.60
6	Attention to the Appropriate Pause	Social	Socio-Cultural	0.55
7	Gathering of Users (Interaction and Conversation)	Socio-Cultural	Socio-Cultural	0.51

No.	Top Indicators (Top Criteria)	System	Structural Dimensions based on the TND Approach	di
8	Natural Robust Centers	Living Structure	Environmental	0.37
9	Local Symmetry	Living Structure	Environmental	0.32
10	Diversity of Economic Functions	Growing Economy	Economical	0.12
11	Emphasis on Revitalization Strategies	Growing Economy	Economical	0.09

The effectiveness of this grading in the urban interior design system leads to the creation and stabilization of the following:

1. Consolidation of the nature of neighborhood centers with regard to dynamic and efficient space with a social, cultural, economic and environmental approach (TND).
2. Paying attention to the coherence and integrity of the urban context through efficient emphasis on the in-between space network.
3. Correct and balanced influence of social components in the structure of neighborhood centers and paying attention to the participation of people in creating environmental interaction.
4. Paying attention to climatic comfort and protecting and revitalizing the urban green fabric.
5. Adjustment of functional density as well as physical-spatial connection with emphasis on creating and stabilizing effective spaces.
6. Attracting investors and creating jobs through the diversity of economic functions.

8. CONCLUSION

This research is based on the opinion that the multi-criteria dynamic network of intermediate space; By emphasizing specific ranking, it plays a decisive role in creating an efficient space system. A solution that leads to the growth of layers of social dynamism in the intra-city context in the neighborhood design strategy with the TND approach. One of the best ways to revive traditional neighborhoods is to recreate them based on a development-stimulating approach to restore vibrancy, a sense of life, and enthusiasm in social interactions. According to the investigations carried out in this research, it can be concluded that the quality of the in-between space in the neighborhoods can affect other qualities such as the human-environmental qualities, and with the increase in the quality of the in-between space in the neighborhoods, we can see an increase in social interactions and, as a result, the dynamism within the neighborhood.

The process of reviving and creating intra-neighborhood dynamism by focusing on the centers of the neighborhoods is gradual, continuous, time-consuming and endless, and the output of this process is the dynamics of the place, which is the result of the interaction of people and groups with the space and the production of meaning. Along with this reproduction, it is important to simultaneously pay attention to the concept of the future of neighborhoods and emphasize the concept of future heritage and intelligently combine these two.

In the end, it can be said that several fields, including integrated social, economic, physical and environmental management, influence the revitalization of neighborhood centers and as a result, they create the nature of the output and the final product, which is the dynamic within the neighborhood.

The findings of the research indicate that the organization of intra-neighborhood dynamism, through the in-between space network, is an intertwined category. Based on the results, this event originates from various factors such as economic development strategies in the neighborhoods, diversity of economic performance, the scale of the neighborhood center, attention to the social need for pause and movement, appropriate physical, visual and movement access, gathering users from different cultural levels, confinement Desirable is diversity in spatial planning and the use of living structures in creating space. The scale of the neighborhood center as an intermediate element and the appropriate physical, visual and movement access to it and the diversity in the spatialization of the neighborhood center have the greatest impact on the network of intermediate space and the neighborhood and provide the basis for social dynamism in the neighborhood centers as a channel for the flow of social dynamism to the neighborhood and the city. provides

This research can be useful and effective for formulating the design criteria of the in-between space in contemporary neighborhoods in order to improve the quality and dynamics of the space of today's neighborhoods. It is hoped that these results will become the basis for researches in the direction of revitalizing the centers of historical neighborhoods, as a legacy for future generations, and in the design of new neighborhoods, following the criteria resulting from this research, we will witness more dynamism and dynamics in the relationships between the lost links in the formation of the neighborhood-city structure.

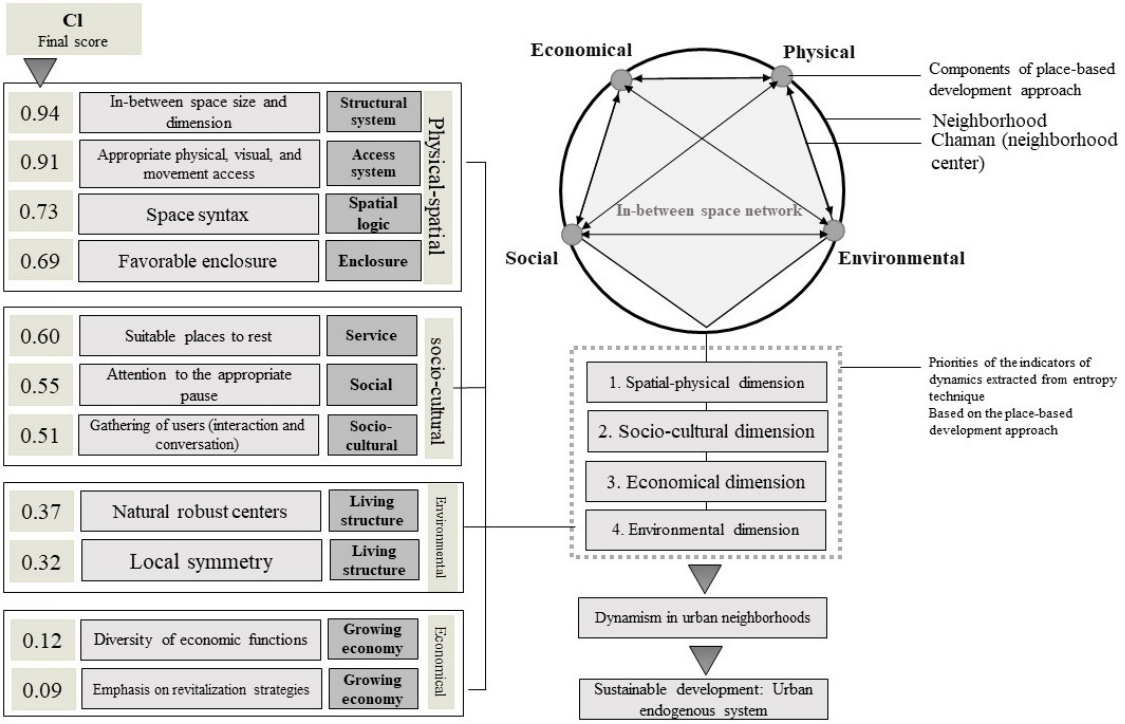

Fig. 8. Analysis Diagram of In-between Space System of Neighborhoods in Hamedan City
With screening of affecting criterias the dynamism of the in-between space based on analysis of entropy techniqu.

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