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Spatial Hierarchy in Iranian Mosques (Case Study: Jame Mosque of Yazd)

Seyyed Mojtaba Mirhosseini[a], Mojtaba Ansari[b]*, Mohammadreza Bemanian[c]

[a]*Ph.D. Student of Architecture, Department of Architecture, Faculty of Art and Architecture, Tarbiat Modares University, Tehran, Iran*
[b]*Associate Professor, Department of Architecture, Faculty of Art and Architecture, Tarbiat Modares University, Tehran, Iran*
[c]*Professor, Department of Architecture, Faculty of Art and Architecture, Tarbiat Modares University, Tehran, Iran*

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Abstract

The principle of hierarchy is one of the fundamental principles that dominate the universe. This principle is considered in the Muslims architecture and in Islamic thought. In this research, initially the position of hierarchy in Islamic art is explained in order to find out its importance and necessity. Afterwards, study the various spatial hierarchies through sample analysis of Iranian mosques (Jame mosque Yazd). The main research question is how the hierarchy of space is understood in the field of architecture? And how this meaning was manifested in Iranian mosques architecture? The research process is based on descriptive-analytical techniques and the required data is collected through library and field studies. The research and inference process is based on a case study analysis, and the extraction of qualitative and quantitative data. The research results show that "proportions" and "shape and form" are the most important factors in creating the spatial hierarchy in architecture of the Jame mosque in Yazd and to create a spiritual preparedness to enter the building and to understand the correct conduct from one space to another space in architecture.

Keywords: Hierarchy; Iranian Architecture; Jame Mosque; Yazd

1. Introduction

The significance of hierarchy according to the Holy Qur'an perspective can be pursued in two ways: one from the point of view of the verses and other the meaning and interpretation of the verses. As it is seen from the eleventh verse of Surah al-A'raf, it indicates the existence of sequence in the stages of human creation and the prostration of the angels upon him. It is also possible to

* Corresponding author. Tel: +98-9123017465.
E-mail address: Ansari_m@modares.ac.ir.

study the family verses, which shows significant differences in the order of the mentioned relatives in Quranic verses. For example, due to their status and respect, parents have been considered superior to other relatives (Naghibzadeh, 2008: 167). But the meaning and interpretation of some verses can be found that type of sequence has been mentioned as hierarchy of human existence in Islamic teachings. The purpose of the hierarchy existence is that all the creatures of the universe, such as the chain loops or ladder stairs are interconnected from pure existence to non-existence in a regular order, and the position of each in this hierarchy depends on the degree of intensity and its weakness existence level (Nasr, 1980: 114). The degree of existence itself is a kind of inner hierarchy that the spiritual value increases from bottom up (Mirhosseini, 2018: 125), and creates two modes of divine and supremacy in mankind, which in the first state, the body is without soul and in the second state the spirit is without body (Naghizadeh, 1999: 276). The footprint of this principle can be seen in Iranian mysticism. The mystics know the main aspects of existence on five occasions, and they are called as "the divine goddess". Islamic scholars have accepted the same division from Suhrawardi onwards, but generally have used other terms to describe and express each hierarchy (Nasr, 1996: 175). In epic literature closely related to mysticism, we open the story of seven cities, or seven houses, love in the form of seven chamber (meaning seven houses) (Ellahi Qamshahi, 1997: 336).

This sort of personality is not specific to the Iranian-Islamic geography, but throughout the cosmopolitan people, the theme of fixed universe has been revealed hierarchically (Nasr, 2001: 167). In order to clarify the connection between the hierarchy of existence and the hierarchy in which human beings deal with it in life, one can say that "... human as a minor world is the mirror of the whole façade of the great universe, so the human soul also has a similar hierarchy and correspond to the Great Universe. That is, each potential level of human soul, if it can be achieved, can lead to the recognition and perception of its corresponding existing hierarchy in the great universe" (Mohammadian Mansour, 2007: 62).

What has been said about the principle of hierarchy from the view point of Iranian-Islamic studies is the expression of human beings acquaintance to the traditional society of the various aspects of hierarchy. This understanding in the traditional society has determined color and has significant effects in the field of human artifacts, including architecture and urbanization. In a mosque, there is no arc that induces a transcendent meaning that, by replacing it the hollow of the concept disappears, but the geometric design, light proportions, spatial order, and access to hierarchy which gradually shift the individual from daily routine to a quiet place for prayer (Zargar, 2006: 115), which expresses the importance of the issue of hierarchy in human life and its function in his works.

2. Literature Review

2.1. Types of Hierarchy

The hierarchy defines the relationship between the components of a set to create a whole unit. An environment as a set has components that are defined by the hierarchical relationships. Naghizadeh (1999) divides the hierarchy of the environment into the following categories: regional hierarchy, neighborhood hierarchy, passage hierarchy, functional hierarchy, and spatial hierarchy.

Grötter (2011) states in the definition of space: the closest definition is to consider space as a void, which can accommodate an object or fill it with something. Space is not an entity that has a definite definition, but it is measurable. Also, space in its existing concept alone cannot offer any particular features, but as soon as a human group places an activity, the symbolic meaning of space

emerges. Henceforth, space is the base to express human activity and behaviors; a place for imagination and reality (Habibi, 2003). Hence, in general, it can be said that space is the essence of architecture. Space in architecture protects human beings from natural factors and encompasses all his personal and social activities. In other words, human beings in space provide their material and spiritual needs. According to the above definitions, space can be divided into form and function, where form is geometry and structure, and its function consists of people and activity (Fig 1).

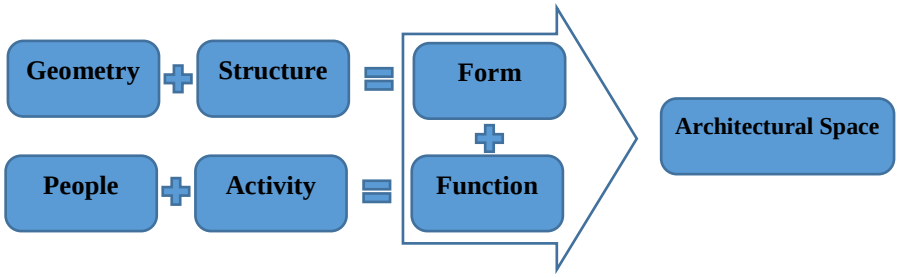

Fig 1 Factors forming space in architecture (Source: Author)

Hence, space hierarchy was chosen as evaluation criteria to incorporate the main factors of the architectural space (i.e. structure, form, people, and performance) among other types of hierarchy. The spatial hierarchy addresses the inside connection of the building (as a private space) and its adjoining spaces (as the public space) and clarifies the details of this relationship (Naghizadeh, 1999). Its observation in architecture has been the factor of the emergence of many concepts in the artistic environment. Hence, we explore the factors for creating a hierarchy of space in architecture, and then, based on the obtained factors, we will examine and analyze the case study.

2.2. Factors Creating Spatial Hierarchy

Tabasi and Jami (2006), by the definition of space, consider many factors in construction of effective space, which are called as the main factors of form, function, structure and materials. Also, time, light, color, decoration, and proportions are considered as secondary and effective factors in strengthening the expression of architecture and space perception. Meaning of proportion is relative in architecture which expresses the relationship between two or more dimensions. In architecture, this ratio corresponds to our spatial perception. In other words, change in the proportions of an emotional space that one has in relation to that space changes or actually the space changes. The change in proportion creates a new atmosphere that is not associated with the cognitive background for the audience. Therefore, although the respondent emotional percept at the moment of confrontation with the effect, but the mental perception of the new space requires time for thinking, this is the moment that is the goal of the Muslim architect (Tabasi and Jami, 2006: 84).

A form is conceptually subjective and in order to be able to exist, it needs something that can represent that form. The forms have a variety of rules (circle, square, triangle, etc.) and non-rules each due to their characteristics creates a special atmosphere. Experiments have proven that in determining position in space, form plays an important role than color. For example, for children of a certain age, color is more important than the form. The perception of color depends on the light and color of the environment (Grötter, 2011: 449).

Light is the first condition for any kind of perception. In darkness, one cannot percept form, color, and space. Light in addition to practical use has always been of symbolic values. In religious architecture, using appropriate lighting creates a visual phenomenon that is not perceptually precise

and gives a mystical mood to human (Grötter, 2011: 449). Light is effective in creating prominent spaces and extends the scope of imagination. By considering the relation of light with decorative elements and combination of space can reach to a wide range of possibilities in visual art (Haji Ali Mohammadi, 1993: 13). Muslim architects by using skylight bring in the light to the interior dome space.

Shekari Niri (1999) about the decoration in Islamic art, especially mosques architecture says: Eslimi designs in Islamic architecture, especially in the mosque's elevation are widely used, which are abstracted from plant designs and symbol of the tree of life and the paradise garden. In the role of the knot, whether on tile, engraving, or mogharnas, all designs finally lead to the shamseh, which reminiscent of unity. Light and water are important components of Islamic decoration, as they can create more layers of designs and patterns and change the space (Edrisi Khosroshahi, 2007: 44). Ahmadi Maleki (2008) refers to the forms and symbolic roles of Iranian architecture that creates the spiritual environment. The Iranian mosques are a manifestation of visual aesthetics and a clear example of the combination of symbolic forms with deep beliefs. Hyacinth is the visual level that descends from their rank in order to express a transcendental meaning. Among these symbols are blue, cyan and cobalt blue colors that symbolize immortality. The tiles patterns originate from plant motifs associated with life. In mosque architecture lie the cosmic meanings. The shape of the squares at the bottom of domes associate the earth and the place, and the top circle associate with the sky and the time. The octagonal base of the dome is the interface between the earth and the sky and the symbol of the universe of angels (Ardalan and Bakhtiar, 2012). In addition to the shape, color and texture of space, the change in the floor level relative to its adjacent surfaces determines the severity of space limited by that surface and the intensity of creating a base against other elements in space in order to be seen (Mortazai, 2002: 37).

Urban form and architectural space are understood through the incomplete means of the human eye that can get a limited level at a glance. Understanding the urban form and space by human is proportional to the human distance. For example, human from long distances can only understand the general form of the city or the architectural space, and at further longer distances, the image of the city replaces the urban form, which consists of visual elements of the environment such as activity centers, signage, borders and synchronous movement systems. On smaller scales, forms can only be understood by pedestrians. The combine arrangement of spaces and architectural elements should be considered (Tabibian et al., 2011: 71).

According to the above description, which is a summary of library studies by the researchers, the factors for creating a hierarchy of space in architecture can be summarized in Table 1.

Table 1 Factors creating a spatial hierarchy in architecture (Source: Author)

No	Factors	Description
1	Balance	Change in floor balance
2	Decoration	Brickwork, tiling, Chinese knot, mogharnas, etc.
3	Proportion	Change in relation to length to breath and length to spatial height
4	Sight and landscape	Create and change of visual frame and different views from space relative to its surrounding
5	Atmospheric condition	Change in atmospheric condition including radiation, temperature, rain, humidity and wind
6	Shape and form	Change in shape and geometric patterns of plan and section
7	Acoustic	Occurrence of acoustic phenomenon like resonance and echo, etc.
8	Material	Change in cladding material and texture and color of space
9	Symbolization	Use of symbol of beliefs and culture, etc.
10	Light and lighting	Change in the light intensity and natural lighting of the space

3. Research Methodology

In order to answer the research question, first the domain of research and explanation of the statistical society (Iranian architecture) as well as the statistical sample (Jame mosque Yazd) are introduced as the dependent variable. Also, to make it possible to measure the impact of the hierarchy for the case study, the factors of its formation in the architecture are explained. The data collection is based on library studies and the analysis of information and decision making about independent and dependent variables is by logical reasoning method. In order to reach the goal of the study, a case study was carried out in the research methodological framework. Data collection was done by field method and data analysis in a comparative way. Finally, in order to understand better and analyze more precisely, qualitative analyzes to quantitative have been discussed.

3.1. Study Area

The height of glory in architectural work is the mosque. With accurate study we will notice that at any time period the variety of decorations used in the mosques are not obvious. Dynasty and Islamic governance since beginning till date has been involved in the evolution and progression (Chitti, 2000). Therefore, among various land uses of the Iranian traditional architecture, among the mosques the Jame mosque has been selected as a symbol of the Islamic city and the most important public building of the city, which was formed mainly at the core of the city and is accessible till the present day. The Jame mosque of Yazd was built for more than 800 years, and the structure has remained intact for years. The mosque structure has been added with decorations in such a way that it spreads to its fullest extent and brings it to its peak of glory and is available to the author in order to visit and for field analyzes, as a case study.

4. Discussions and Findings

In this section, the Jame mosque of Yazd was analyzed based on the factors creating the hierarchy of space in architecture. This analysis was performed on the basis of the main parts of the mosque and, accordingly, the movements of the audience from the outer element namely courtyard to its interior that is the altar. Due to the limitation, only the two parts, the gateway and the dome area has been analyzed, and the findings related to the analysis of the parts are presented in tables and charts.

4.1. Gateway (Entrance)

The high gateway of Jame mosque was built in the Azeri style, and two minarets were added in Esfahani style to prevent the collapse of the arch. It is one of the tallest entrance gateways with a ratio of 1:3 (Pirnia, 2008: 233). The gateway has indent part that defines the empty space of gateway and the gathering location of the mosque; and strengthens the invitation to the interior of the mosque. This indent is due to a step from the courtyard to a higher level, which reminds the audience of the change in space and the consequent change in behavior. On the two sides of the indent, there are two high-rise platforms as a resting place for the pedestrian, along with other horizontal lines dividing the surface, which helps to make the scale more human. The materials and decorations of the gateway are completely different from the courtyard, which draws the attention of the audience. The use of beautiful tiles with motifs and colors are taken from the nature and Quran inscriptions around the entrance gateway, creates a sense of calmness and reminiscent the beauties of creation and creator. Change in the proportions of the gateway to its adjacent walls is

one of the important aspects in designing this section and creates a hierarchy of space in the building. The stretched proportion and the vertical movement of the gateway emphasizes the entrance and mosque's privacy, and converts the horizontal motion of the courtyard (symbol of the material world), toward sky vertically and acts as the sign of the Islamic city causing legibility of the mosque in the city's surroundings and motivates the movement in the city at different intervals.

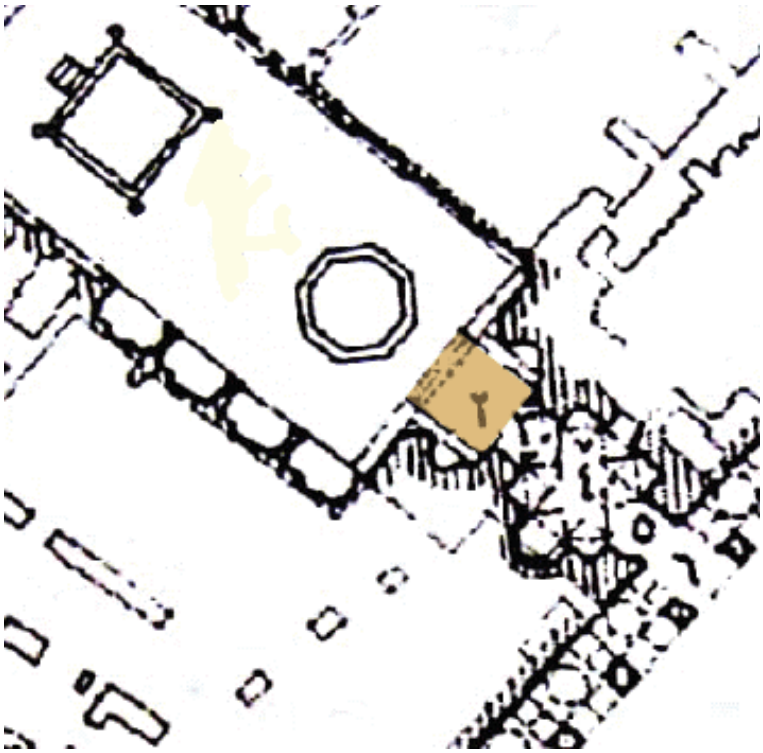

Fig 2 Entrance gateway plan of Jame mosque of Yazd (Tavassoli, 2007, edited by the author)

Table 2 Spatial hierarchy analysis of entrance gateway of Jame mosque Yazd (Source: Author)

No	Factor	Analysis
1	Balance	+
2	Decoration	+
3	Proportion	+
4	Sight and Landscape	+
5	Atmospheric condition	-
6	Shape and form	+
7	Acoustic	-
8	Material	+
9	Symbolism	+
10	Light and skylight	-

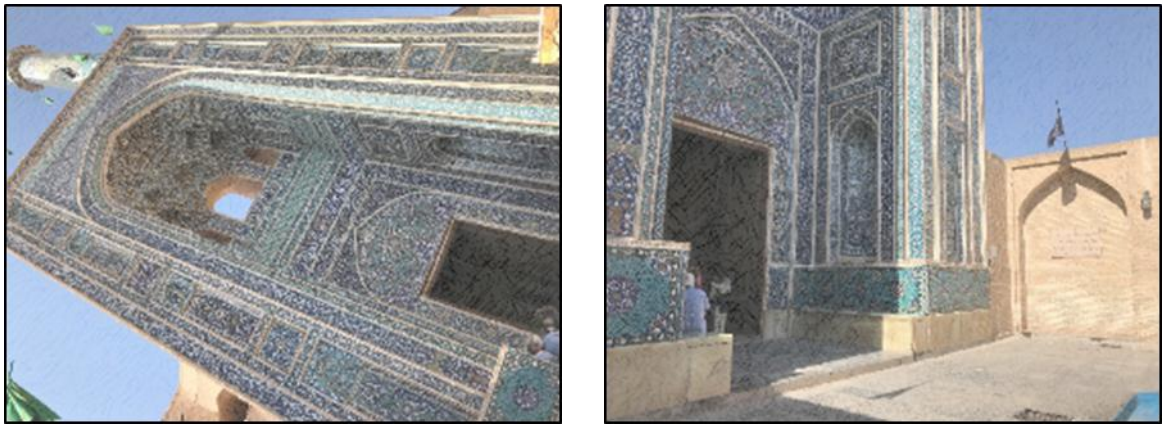

Fig 3 Entrance gateway of Jame mosque of Yazd (Source: Author)

4.2. Dome Area

The stretched porch space leads to the dome. The porch and dome are at a level and in terms of decorations and materials used in the walls are close to each other which covers the space. Brick knot with lacquer tile and tangled knot with turquoise color is one of the most important decorations of the dome space. As mentioned in porch, the change in geometry, form, and proportion of space relative to its perimeter spaces, especially porch, is an important point to be considered in designing this space and creating a spatial hierarchy in this part of the building. The square proportions and strong vertical movement of the dome area emphasize the presence of the audience at the focal point of the building. The center, because of the symbols used in geometry and its decorative motifs guide the people from earth to heaven and it reminds them that although it has reached to an end, it is just the beginning, a way that its destination is a point in the sky.

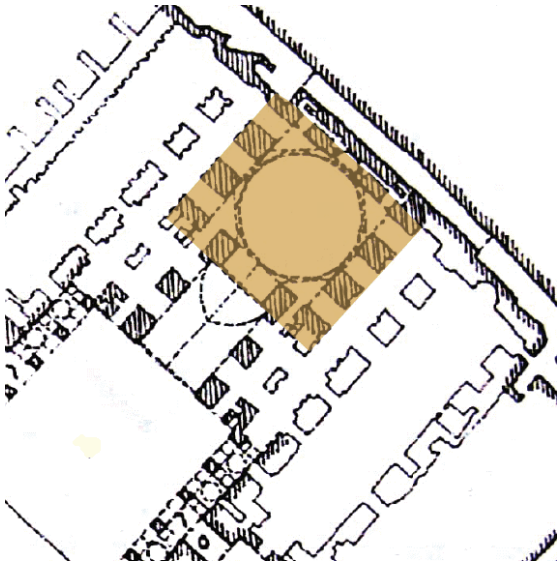

Fig 4 Dome plan of Jame mosque of Yazd (Tavassoli, 2007, edited by the author)

Table 3 Hierarchy analysis of dome space of Jame mosque Yazd (Source: Author)

No	Factor	Analysis
1	Balance	-
2	Decoration	-
3	Proportion	+
4	Sight and Landscape	+
5	Atmospheric condition	+
6	Shape and form	+
7	Acoustic	+
8	Material	-
9	Symbolism	+
10	Light and skylight	+

Access to the interior of the dome area is possible through the corners and porches. The dome space is illuminated by brick lattices on the east and west sides of the building and above the corners are embedded, as well as through the openings on the curves of the dome. The sun movement throughout the day and sunlight from these openings entering to the interior space and its movement on the floor and walls of the dome increase the sense of space and signs of the presence of the creator are reminded to the creature. The high double shell dome causes the coolness of the space in summer, and its relative enclosure makes the transfer less frequent in porch and the presence of more deities'. The eastern and western walls of the dome due to the columns that transfer the dome load to the ground are divided into three openings at two levels, which make it possible, while creating a human scale and reducing the mass and fluidity of space, ventilation, visibility and accessibility to the corners.

a. Under the dome area

b. Dome

Fig 5 Jame mosque of Yazd (Source: Author)

Further, in order to understand better and precisely analyze the Jame mosque of Yazd from the viewpoint of the spatial hierarchy, an attempt have been made to code and transform qualitative analyzes into a quantitative one, the output result is presented in the tables and diagrams.

Table 4 Parts, code and analysis of spatial hierarchy of Jame mosque Yazd (Source: Author)

No	Space name	Associated space	Period built	Code	Percent available
1	Counter	Gateway	Esfahani	1, 3, 4, 5, 6, 7, 10	70
2	Gateway	Counter, vestibules	Azeri	1, 2, 3, 4, 6, 8, 9	70
3	Vestibule	Gateway, porch, hall	Esfahani	2, 3, 4, 5, 6, 7, 8, 10	80
4	Porch	Vestibule, court, hot area, hall, Ivan	Qajar	1, 3, 4, 5, 6, 7, 9, 10	80
5	Court	Porch, Ivan	Qajar	3, 5, 6, 9, 10	50
6	Lighting	Court	Qajar	1, 8	20
7	Eastern hot area	Porch	Pahlavi	2, 3, 4, 5, 6, 7, 8, 9, 10	90
8	Western hot area	Porch	Qajar	3, 4, 5, 6, 7, 10	60
9	Hall	Vestibule, porch, Ivan, corner, dome area	Azeri	1, 3, 4, 6, 7,	50
10	Ivan	Porch, court, hall, dome area	Azeri	2, 3, 4, 5, 6, 8, 9	70
11	Corner	Hall, dome area	Azeri	1, 3, 4, 6, 7, 10	60
12	Dome area	Hall, Ivan, corner	Azeri	3, 4, 5, 6, 7, 9, 10	70
13	Altar	Dome area	Azeri	1, 2, 3, 6, 8, 9	60

As shown in Table 4, the porch area and hall has the maximum relation to other spaces of the mosque, while the spaces such as the courtyard, the skylight space, the hot areas and the altar have the least connection with other spaces. Also, there are all major construction periods, as well as changes in the structure of the mosque between the parts of the mosque.

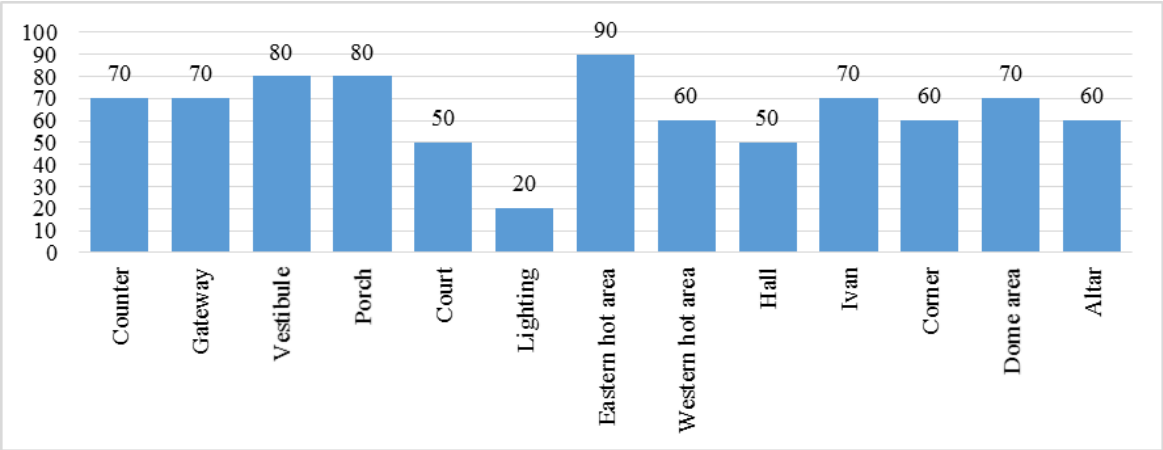

Chart 1 Frequency of spatial hierarchy in the parts of Jame mosque of Yazd (Source: Author)

As shown in Table (4) and Chart (1), eastern hot area with the highest code and the highest use of spatial hierarchy creation factors has the highest frequency (90%) among the mosque spaces. After eastern hot area, the vestibule space and the porch of the mosque with frequency of 80 percent, as well as the courtyard spaces, gateway, porch, Ivan and dome area with the frequency of 70 percent are most used to create spatial hierarchy. In contrast, the skylight space with the lowest

code and the least use of spatial hierarchy creation factors has the lowest frequency (20%). After that, mosque courtyards and halls with a frequency of 50% has the least use of the factors creating a spatial hierarchy. Hence, it can be said that the hierarchical quality of a space or the use of factors creating hierarchy in a space with the number of spaces associated with it, has no significant relationship. So the eastern hot area, which only has a porch connection, has the maximum frequency and the hall spaces that are connected with many spaces such as vestibule, porch, Ivan, and dome area has the lowest frequency.

On the other hand, by ignoring the skylight area, it can be seen that the spaces and corresponding parts in terms of hierarchical quality of space has frequency of 50 percent. Therefore, it can be said that architects of Jame mosque of Yazd, (during 800 years), in designing and constructing all the major spaces of the mosque in terms of hierarchy, from the outer space to the inner space has utilized at least half of the factors in creating the spatial hierarchy and in the set of spaces and parts more than two-thirds of these factors (total frequency 67.5 percent). This shows the high importance of the hierarchy criteria in designing and constructing of mosque spaces, religious spaces and even other environmental spaces in Iranian architecture.

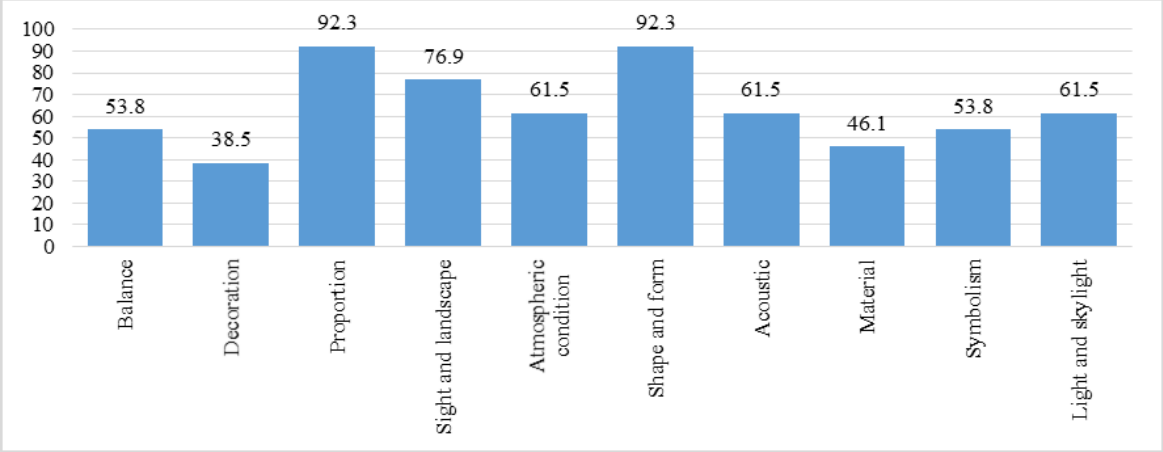

Chart 2 Factors frequency for creating spatial hierarchy in parts of Jame mosque Yazd (Source: Author)

As shown in Chart (2), all factors creating hierarchy are used in the mosque vicinity. Of course, factors such as shape and form and proportions with the frequency of 92.3 percent and sight and landscapes with frequency of 76.9 percent had the most use in parts. In contrast, factors such as “decoration” with frequency of 38.5 percent and “materials” with frequency of 46.1 percent, has the least use by the parts of the mosque. But the overall frequency of 63.7 percent indicate that architects in designing and constructing more than half of the main parts of the mosque have used these factors to create hierarchical quality, which shows the importance of all parts of the mosque in terms of quality of hierarchy.

The main factors in creating hierarchy in the mosque's parts are shape and form, and proportion and not decorations and materials. In fact, it can be said that the architects are familiar with the form and proportions, and on a macro scale it has the tools to create a hierarchy of space, and has used decorations as a space supplement on a micro scale.

5. Conclusion

As explained, eastern hot area with the highest code and the highest use of spatial hierarchy factors has the highest frequency (90%) among the mosque's spaces. The skylight space with lowest code and the least use of factors creating spatial hierarchy has the lowest frequency (20%). Hence, it can be said that the quality of hierarchy of a space or use of factors creating hierarchy in a space does not have a significant relationship with the number of spaces associated with it.

On the other hand, by ignoring the skylight area, it can be seen that the spaces and corresponding parts in terms of hierarchical quality of space has frequency of 50 percent. Therefore, it can be said that architects of Jame mosque of Yazd, (during 800 years), in designing and constructing all the major spaces of the mosque in terms of hierarchy, reaching from the outer space to the inner space has utilized at least half of the factors creating the spatial hierarchy and in the set of spaces and parts more than two-thirds of these factors (total frequency 67.5 percent). This shows the high importance of the hierarchy criteria in designing and constructing of mosque spaces, religious spaces and even other environmental spaces in Iranian architecture.

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