A Comparative Study of Iran's Pre-Islamic and Islamic Architecture in Iran

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ABSTRACT
The study is in fact from the pre-Islamic and Islamic periods architectural principles and their comparison with architectural principles of Iran (democracy, avoidance from extravagancy, Niresh, egotism, and introspection) which according to this comparative study of the two periods and its comparison with architectural principles of Iran, the avoidance from extravagancy principle goes back to pre-Islamic architecture and it is emphasized in post-Islamic architecture and it means proper use. Iranians believed that word "beautiful" means to be becoming and proportionate. Therefore, this concept is manifested in Taq Kasra (Eyvān-e Madaen) which belongs to pre-Islamic Sassanid-era. But among other principles, are the principles of Niresh and introspection which have been mentioned in pre-Islamic architecture (the Achaemenid period) and after Islam (in Seljuq period). Also, descriptive-analytical research method is used in this article.

KEYWORDS
Architecture principles, Achaemenid architecture, Sassanid architecture, Islamic period architecture in Iran, Seljuq architecture, pre-Islamic architecture.

INTRODUCTION
Understanding architecture begins with understanding its components. This interpretation includes all physical and structural elements and sociocultural matters, which are derived from the humanities branch, construct a whole which is referred to as architecture. Architecture is formed in the environment and hence, understanding all the environmental, geographical, and human factors is necessary for laying the foundations affecting the body. This research attempts to examine these factors briefly. Generally, these factors can be categorized as the following: Climate, Acoustic, Natural potentials, Culture

PROBLEM STATEMENT AND RESEARCH OBJECTIVES
Everywhere and in every society, people create a culture according to their surrounding environmental factors and in every culture, some demands are more important than the rest and architecture is also formed with regard to these cultures and environmental factors. Perhaps these factors create the basis, foundation, and objectives of an architecture that must be formed accordingly.

Geographical and Environmental Factors:
By paying close attention to different climates of our country, it can be concluded that every part of it has grown according to climatic conditions and based on specific conditions of each region, geographical specifications, height above mean sea level, humidity and rainfall, has been formed well and reached perfection over time. Therefore, prior to designing, environmental factors including rainfall, direction of the wind, dominant orientation of buildings to north and south axes, proper light exposure direction, etc. must be considered. What we are talking about is that the new functions in Islamic civilization, required a certain way of organizing space on behalf of architects, quality and human content of architecture emerges in organization of space and the relationship between form and meaning, the part and the whole, outside and inside, or in other words, in the course from multiplicity to unity; otherwise, dimensional and analyzed study of elements and components of an architectural body is like analyzing and evaluating the parts of an organism's carcass separately. Some like John Hough, with simplification, consider mosques the pattern of all buildings of Islamic civilization. Perhaps utilization of the same structural elements and the use of Miansara (central courtyard) in the buildings misled him; although the organization of these elements and bodies have a lot in common, the distinctions are quite significant. Since they have various functions; function of mosque and inn is different from traditional school and home. Yet it might be
possible that special spaces be organized around Miansara in all of them. This applies to many examples of the Islamic period architecture.

**THE OVERALL STRUCTURE OF THE ARTICLE**

**A) Achaemenid architecture**

After the defeat of Astyages ruler of Media by Cyrus the Great in 560 BC, the Achaemenid great empire was founded. Among the civil measures of this period construction of Royal Road from Sardis to Susa with 112 way stations, and paving the ways between Susa, Persepolis and Ecbatan can be mentioned. Achaemenid art is a royal art and the most important structures left from this period are royal palaces. Of course the architecture of the tombs of this period is important. Features of Achaemenid period architecture are as follows:

1. Adaptation of Urartian architecture in rectangular area, columned halls, and blind niches
2. Constructing the building on the platform
3. Oriented buildings
4. Using wooden roof
5. Foundation construction with rubble stone
6. Flooring with high quality materials
7. Exterior design with stone and interior design with glazed tiles
8. Using the base and the head of the column proportional to the loading
9. Using dry materials and metal fasteners for fittings

**B) Tomb of Cyrus the Great**

Mausoleum of Cyrus the Great is located in Morghab plain in village of Solomon's Mother (Pasargadae). Tomb of Cyrus is derived from Urartian architecture and architecture of pyramid tombs of Egypt. The sloping roof of this building bears witness to this claim.

**C) Pasargad Garden**

Pasargadae is one of the most beautiful gardens which includes many palaces and pavilions. One of the most fundamental factors of Iranian garden design; i.e. Chahar Bagh can be seen in Pasargad Garden.

**D) Apadana Palace in Susa**

Susa was one of Achaemenids' capitals which Darius I chose it as his capital. However, due to the warm climate of Susa region, it seems that it had been a winter seating for Achaemenid kings.

**E) Persepolis**

Construction of Persepolis dates back to around 500 years BC. It is located in Marvdasht city, and 45 km away from city of Shiraz on Rahmat Mountain slopes. Persepolis and the site of its buildings are constructed from a map. The platform is surrounded by a tower and a rampart made of rock stones which were both a barrier to the platform and had a defensive role.
The stones of this wall are skillfully connected without mortar and with iron fasteners. Buildings in this complex include: the entrance ramp, Gate of All Nations, the Apadana, Hall of A Hundred Columns, Council Chamber, royal treasury, Tachara of Darius, and Hamish of Xerxes. Gate of All Nations architecture is monumental. The huge statues of winged bulls with human heads are symbols of power and protection. This gate is situated on Throne Hall axis and guided the guests to the hall. Introspection can be well observed in the map of Persepolis buildings and this indicates people's belief in hijab at that period. Column in Achaemenid architecture, as a key element of Achaemenid architecture, was built from monoliths with concave (spoon shaped) grooves. The head of columns were made in the shape of animal heads and their base consisted of a cube with a turned vase over it. The columns were the highest of all columns made all over the world until then. Achaemenid architecture is based on the repetition of square-shaped cells. The combination of architecture and relief at Persepolis has reached the stage of perfection. The figures have dignity. The building provides the space outside within itself by an element called the "yard". Basically, Iranian religious beliefs had been influential in the formation of different areas, especially residential space. One of those features was respect and reverence for private life. Iranians' self-esteem has somehow influenced the formation of spaces within an introspective house. However, they are not sullen. They had simple clothing and their embellishment is limited to the pleat of their fabric. In Persepolis carvings, lotus flower (lotus) is used. Other works of Achaemenid architecture are rock tombs in Naqsh-e Rustam and Persepolis. Rock tombs of this period has been adapted from Mary's rock tombs. Although Cyrus' tomb was designed as stepped, his successors' tombs, including Cambyses' tomb at Pasargadae, Darius, Xerxes I, Artaxerxes I, and Darius II in the Naqsh-e Rostam are rock tombs.

G) Firuz Abad Dokhtar (Girl) Castle:
This castle which is located at the top of Tangav Mountain, situated near Tizrah River, is surrounded on three sides by the strait. The utility of this castle had possibly been for military base. The main hall of this building, in form of a dome with rooms on the sides, takes the form of a massive circular castle on the highest point of the mountain range and it is located inside the defensive line of the castle. The tip of the dome of this building is wide to the open sky, which is called "Horno".

H) Firuz Abad Palace
This building is situated outside Firuz abad city next to a bubbling spring full of water. Of course, according to the late Pirnia, this building is a fire temple and it does not have the space that a palace must have. This building is shaped like Parthian buildings with a porch and now it is combined with one or two domed chambers.
1. Vernacular materials for construction; such as rubble stone
2. Using barrel vault and dome for covering the roof
3. Building wind catcher for flow of air within the walls
4. Having a map with axial symmetry
5. Creating a central courtyard and introspection of the building "in accordance with the climate."

I) Taq Kasra (Eyvān-e Madaen)

This building is one of the most important monuments of this period which is located in Iraq.

The most important features of this building include:
1. Utilizes golden ratio in the large central porch (40 * 24) multiplied by 1.0666 is equal to (42/6 * 25/30) meters
2. Using barrel vault for covering the roof
3. Using conventional materials which are available; such as mud bricks
4. Construction of buildings on the platform; such as Persepolis and Qasr-e Shirin

J) Islamic architecture in Iran:

Architecture which emerged in Iran after acceptance of Islam in the first century AD and continued until the fourth century is called "Khorasani" style. The reason for such naming had been to create change and cultural transformation which mostly occurred in Khorasan whereupon it reached Damghan, Yazd, and other cities. Architectural features of this style include:

1. Democratization of constructions and avoiding extravagancy and luxury within them
2. Decreasing quality of construction because of the need to build more buildings than the previous period
3. Using Parthian architectural materials but with less height
4. Using Vernacular materials in buildings

During this period, mosque was considered as an example of the new building whose architecture had Medina mosque undertone. Architectural features of mosques in this era are simplicity in design, avoiding extravagancy, democratization, and the use of available materials.

K) Seljuk period architecture:

The rule of Seljuqs includes the period from 431 AD., after the defeat Masood Ghaznuvi's defeat, to 590 AD. Seljuqs government came to an end after the defeat of Toghrul III by Khwarazmians. This period coincided with the lives of great figures such as Ferdowsi, Avicenna, Al-Biruni, Razi, and Khayyam. Islamic culture and civilization in this period from Buyids to Khwarazmians reached its fullest development and progress. In terms of development of the arts, especially architecture, Seljuq era is one of the brilliant periods of art (Seljuqs architecture has great strength and beauty; although about a thousand years passed from that period; in fact, the remaining buildings of that period use the principles of Niresh and avoidance of extravagancy. This term referred to the factors that held the structure and generally consists of the static of the building, science or technology of building, and building materials knowledge. In the past, architects have relied more on the engineering and a building was beautiful when it statically represented its staticity. Also, another principle is avoidance from extravagancy which goes back to pre-Islamic architecture and it is emphasized in post-Islamic architecture and it means proper use. Iranians believed that word "beautiful" means to be becoming and proportional and not beauty. For example, the tiles which are used in many buildings were not merely used for beauty, but because of the weakness of raw mud bricks, they protected it against rain with bricks and tiles. Knowledge of various architectural styles represents the skills of master artists and craftsmen. The flourishing of the arts in this period also owes to the peace and political stability of Seljuqs realm in which artists could create numerous works. Also, the scientist minister Nizam al-Mulk in the Seljuk government boosted the industry and technology. Buildings had four-porch design whose important decorations were brickwork and stucco.

Features of Seljuqs architecture include:

1. Unity of structure and decorations
2. Using brick as the dominant material
3. Using clay seals or ceramic pieces between brick joints
4. Using colored pieces of tile of a single color called "Negin" between the bricks
5. Using Muqarnas both decoratively and structurally
6. Establishing religious buildings with four-porch maps and building inns with the same map
7. Importance of the square element as the headquarters of the government in the city
8. Establishing a porch that leads to the dome home
9. Shallow plaster works

L) Jameh Mosque of Isfahan

This mosque was established in "Khorasani" style and in this period, its design changed from columned shabestan to
four-porch plan. This mosque represents 13 centuries of history, art and architecture of Iran.

![Image](image.jpg)

**Fig. 7. Jameh Mosque of Isfahan**

This mosque has two domes which one of them was established by Nizam al-Mulk in the year 473, and the other one by Taj al-Mulk as an imitation of the previous dome. This dome has fire temple undertone and is of double shell sand type and is one of the most proportionate Iranian domes which introduces a new form of corner squinch with two quarter domes supporting a short barrel vault (Torombeh). This dome is located in the northern shabestan adjacent to Atiq Square. During Seljuqs period, the porches were decorated with double minarets. There are four platforms: Saheb platform is located on the south side, Darvish on the north side, Shagerd on the east side and Ostad, on the west side.

**CONCLUSION**

By conducting studies on Iranian architecture during pre-Islamic and Islamic periods and applying principles of architecture on them, it can be mentioned that introspection had been a significant principle in Achaemenid architecture which had been related to pre-Islamic period and also creating central courtyard and introspection of the building in accordance with the climate which had been one of the significant principles in Sassanid era architecture; thus from the principles of Iranian architecture in pre-Islamic era which had been significantly manifest in the two Achaemenid and Sassanid periods is introspection. However, in Islamic period Seljuk architecture can be mentioned in which two major principles of Iranian architecture has been used, i.e. avoidance of extravagancy and Niaresh. In fact, taking advantage of strength and beauty in the architecture of this period was extremely significant. Therefore, it can be stated that the principles of avoidance of extravagancy, Niaresh and introspection are the most important principles of architecture that have been widely used in the architecture of the two mentioned periods.

**REFERENCES**
