

VISUAL PARTICULARITIES IN THE WORKS OF QAVAM AL-DIN SHIRAZI

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ABSTRACT

Qavam al-Din Shirazi, famous architect of Khorasan in Timurid era, is one of the architects whose works have numerous innovations. These works had not existed before him. Dimensions, form, structure, the use of materials, creating a variety of components, intelligence in harmonization and combination of elements, are some factors that make exclusive his buildings. Irrespective of the technical characteristics of works, the use of visual effects in his buildings has a high position. The mean of visual particularities is to pay attention to visual elements and plastic fineness that Qavam al-Din is used them. The use of visual power of line, surface, different dimensions and colored harmonies that coordinate distinctive and traditional designs with the buildings framework, changed different views into distinguished art-works. The most important purpose of this study is to introduce visual particularities in an architecture style of Qavam al-Din, in addition to meet applied needs of the building, improve its architectural status. In this paper, by introducing and examining the works of Qavam al-Din, with helping existing works, images and designs that we have received from these works, we have tried to describe existing visual particularities in his works and answer correctly to the following questions:

- 1- What are visual particularities in the works of Qavam al-Din?
- 2- Did Qavam al-Din considered visual aspects these invention features?

Obtained results shows that if we examine more accurately what is created by Qavam al-Din, we pay attention, should be granted which are the results of Qavam al-Din's rich genius in using visual elements. Such tempting characteristics, immediately, had a direct effect on other architectural works after him.

Keywords: Timurid architecture, Qavam al-Din Shirazi, visual particularities, plastic elements.

INTRODUCTION

Qavam al-Din Shirazi, a famous architect of Shahrukhi era, is one of few artists who his name is seen frequently in various historical texts, especially in the works of his contemporaries.

In Timurid era, the names of craftsmen and architects have been recorded in many inscriptions. One could explore names of 90 people in it. Among them, only one name is a prominent figure. (Fig. 1) Qavam al-Din Ibn Zayn al-Din Shirazi is a figure that his name is recorded as a distinguished designer in texts and inscriptions on remained buildings (Donald Wilber 1995-1999).



Fig. 1: an inscription with the name of Qavam al-Din Shirazi in Goharshad chief Mosque

It is not clear to us date and manner of finding the way to Timur court. The date of his activity proves when he invited some artists from Shiraz to his capital in 791-796 lunar calendar, he lived in the prime of his youth. If we believe that Qavam al-Din has come to Samarkand in these years, he must have worked for several years as a learner in buildings such as monuments of Turkistan. He probably found a way to Timur court along with his father Zain al-Din Shirazi Tyan. Because with regard to the word "Tyan" which is at the end of his last name, (this nickname was given to his father in Mashhad Goharshad Mosque) he must have engaged in architecture. In excess of this, we don't know anything about the life and works of engineers' guide in the time of Qavam al-Din Shirazi before he achieve to master rank of architects in Timur court. If we believe that he became free of bloody battles in the beginning of his ruling and he wanted to give power to his kingship's splendor, He probably has come to Samarkand along with his father. When Hafiz-i Abru spoke about his unique architecture style in Herat; it seemed he has worked so hard that he changed into a skilled master from an architect's learner, known as the architect of the court.

It is secret to us the date of master's birth. But his death has written "Saturday, the first day of Sha'ban, 842 lunar calendar" (Fasihi 1339: 284). Khandmir was considered Qavam al-Din as "his time engineers' guide & master of architects in his times". (Golchin Arefi 1388:79) Qavam al-Din had a hand in constructing the royal buildings before 813 lunar calendar and he always was active until his death.

In general, during these periods, he has designed and implemented some buildings to order of Shahrokh and his relatives. Studying these works make appear some particularities that are peculiar to him and before Qavam al-Din they had not exist in this manner. These particularities were created generally in order to establish and strengthen the building's visual effects, so that they created eye-catching views and observer get a great pleasure of sight due to observe them.

RESEARCH BACKGROUND

Yet a special book has not been published about Qavam al-Din Shirazi and his works. But those who had written about Iranian architecture, especially the architecture of Timurid era, were regarded him as one of most influential architects of this period that his works has very valuable characteristics in different aspects. Pirnia believes that in the second period of Azeri style, "great architects such as Qavam al-Din Shirazi and his son Ghiyāth al-Dīn and Zayn al-'Abidīn Shirazi were employed as builders of large constructions in vast Khorasan". (Pirnia, Mohammad Karim 1387: 214) in other case, when they discussed his Panjohaft arches problems that apparently its formula was lost during disorders of Timurid era, they said: "obtained arch was not stable such as a panjohaft arch, so it was cracking under burden. This imperfection was resolved by Qavam al-Din Shirazi and Zayn al-'Abidīn Shirazi." (Pirnia 1387: 217) Bernard O'Kane (in Timurid architecture in Khorasan) says that he was very effective in establishing identity of Iranian architecture. He says: Qavam al-Din Shirazi is made possible one of the goals of pilgrimage in organizing constructions like "Goharshad Mosque, Dar al Siadat, Imam Reza shrine) in Mashhad. When pilgrims pass through these interconnected places, they spiritually and mentally were prepared for the greatest enjoyment of pilgrimage. Above-mentioned explanation refers to a symbolic aspect of Qavam al-Din's architecture that is based on visual expression. The relationship between buildings is in a way that brings up such profound effect for the viewer. Arthur Pope (in Iranian architecture) admires his works at the level of an architectural masterpiece of Timurid era. He believes that school building of Ghiasiyeh Khargerd is a unique and cohesive monument (Pope 1370: 197). Elsewhere, about a view of this building he says: "the whole view of this building has a horizontal and flat status" that was a new aspect in the Timurid architecture" (previous: 198). Galina Pugachenkova regards him as a mathematician who is well versed in astronomy and the rotation of planets and is the owner of calendar. Lisa Golombag and Donald Wilber (in Timurid architecture in Iran and Turan) believe that his works has particularities which may be his personal style. These authors attribute to genius of Qavam al-Din the difference between Samarkand and Khorasan architecture in Shahrokhi period and they believe that other architects of that period are his followers. They went farther and urge that Qavam al-Din has a style which is peculiar to him. According to their opinion: Khargerd School is a

best evidence for studying Qavam al-Din style. Because this amazing building is remained intact miraculously and a person could observe complexity of spatial structures as well as the elegance of decorative designs. So one could say that this work was the culmination of his activities and a reflection of Qavam al-Din's fabulous character (Lisa Golombag, Donald Wilber 1374: 259).

This paper is not intended to study all creative aspects in Qavam al-Din architecture and explain them, but according to visual effects of these buildings that are caused by various sources such as: presence in existing monuments and other designs & illustrations, it explain them and study their creative aspects to reveal Qavam al-Din's aesthetic look.

RESEARCH METHOD

In this paper, factors related to the topic are provided by a descriptive- analytic method. So, identifying visual particularities in Qavam al-Din's architecture style is a most important step. Qavam al-Din created a beauty by resorting to Particularities. So, he could make harmonious and pleasing to the eye existing roughness in geometric solids and building materials to have more effectiveness in this way and a structure is closer to achieve its own targets. This goal could be achieved in three following ways:

A- Studying works and published papers about buildings of Qavam al-Din Shirazi. Generally, these papers refer to some of his architectural specifications to introduce them. In this field, works of Lisa Golombag, Donald Wilber, Bernard O'Kane, Danshdoust and reports of The Cultural Heritage Center in Razavi Khorasan are of special importance.

B- Studying prepared drawings of his buildings and examining images that we have received from his buildings.

C- Presence studying his two existing buildings In Khorasan: "Ghiasiyyeh Khargerd School & Goharshad chief Mosque" and taking a picture from these buildings in the present time.

QAVAM AL-DIN SHIRAZI POSITION IN TIMURID ARCHITECTURE

Qavam al-Din is one of most famous architects who was renowned throughout the world in his time. In many texts of his time, they were talked good of Qavam al-Din. This celebrity is clearly evident in the works of authors who have written about his works. This process was continued until today. We are mentioned some of them in the following:

- Dolat-Shah Samarqandi was said: four artists who was unexampled in an inhabited quarter of the world, has lived in the capital of Shahrokhi: Khwaja Abd al-Qadir Maraghi in music science, Yousefi Andkany in singing and dancing, Master Qavam al-Din Shirazi in engineering, design and architecture, and Maulana Khalil Mosavvar who was a secondary Mani.

- Khandmir believed that Master Qavam al-Din, an architect of Shiraz, was a leader of his time engineers and a guide of his time architects.

- Bernard O'Kane says: Qavam al-Din Shirazi is made possible one of the goals of pilgrimage in organizing constructions like " Goharshad Mosque, Dar al Siadat, Imam Reza shrine) in Mashhad. When pilgrims pass through these interconnected places, they spiritually and mentally were prepared for the greatest enjoyment of pilgrimage (Fig. 2).

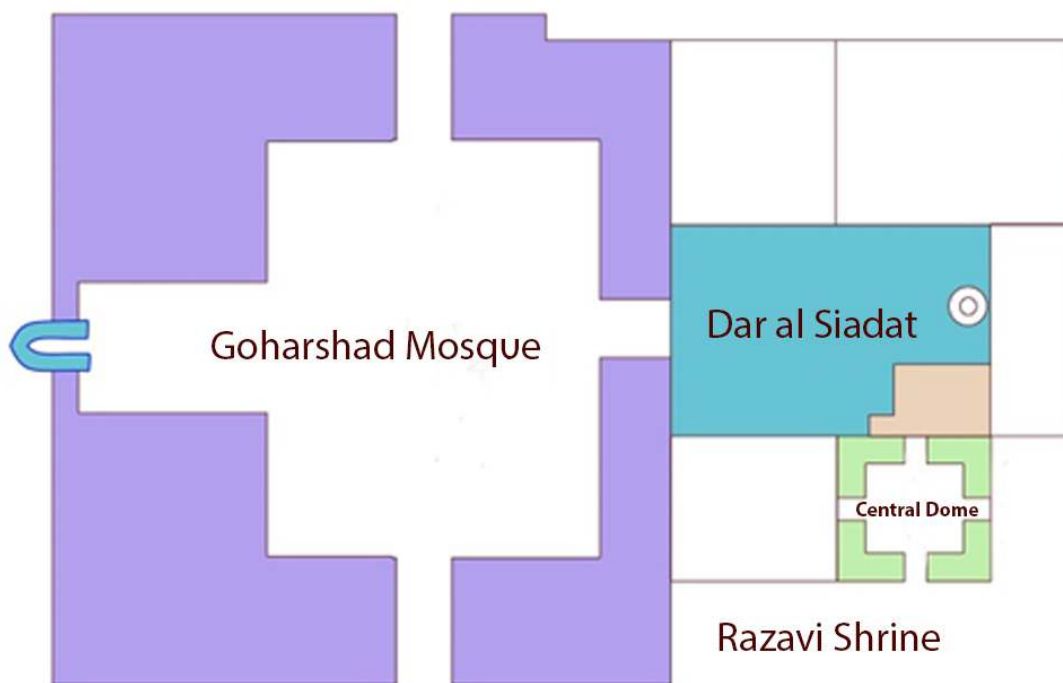


Fig. 2: Neighborly relations of Goharshad Mosque, Dar al Siadat, Central dome in Razavi shrine

- Lisa Golombag and Donald Wilber: Qavam al-Din Ibn Zainuddin Shirazi, is only active builder in Timurid era that he came out from behind the scene of history ambiguity as a person who his remained buildings make manifest personal architecture style.
- Donald Wilber: these works (buildings of Qavam al-Din Shirazi) in addition to the features of Iranian monuments in their times, has other characteristics which are limited to Qavam al-Din work.
- Galina Pugachenkova: a person like Qavam al-Din Shirazi was not only a genius architect, but also an astronomer and extremely accurate author of calendar.
- Donald Wilber: in this huge complex (a complex of Goharshad in Herat) two massive building related to each other that he wanted to show them from all sides, are masterpieces of Qavam al-Din.

ARCHITECTURAL FEATURES OF QAVAM AL-DIN SHIRAZI

Qavam al-Din Shirazi was the most prolific architect in Shahrukh era who was able to create many innovations in architecture style of this era. These innovations that are noticeable in all aspects of his buildings, especially in decorating them, have particular artistic and aesthetic features that whether Qavam al-Din establishes an ostensible change in them for more beauty or he invent it.

In Timurid capital and during almost thirty years of unflagging efforts of Qavam al-Din, many buildings were designed and completed to order of Timurid Shahrukh and his virtuoso spouse. The following list introduces his most important buildings throughout these periods:

- A monastery and a school in Herat
- Goharshad Mosque in Mashhad
- A famous complex, known as Goharshad's Mosalla (including school, mosque and the tomb) in Herat
- The tomb of Khwaja Abdollah Ansari in Herat Gazergah
- Ghyasyh School in Kharger, Khaf

Studying components of above-mentioned buildings and comparing them with other buildings in Timurid era well shows that the works have aesthetic features that whether have been developed and applied for the first time or have been created a great change in them. One could see an artistic and visual harmonious view in most of these characteristics. Some of these most important features are summarized as follows:

1- Designing tower-shaped minarets at the level of ground, located on both sides of the porch. For the first time, it was used by Qavam al-Din in buildings such as Goharshad Mosque in Mashhad, the tomb of Goharshad in Herat and etc. The previous minarets were started from the top of porch. By their special decorations, the minarets give an impressive grandeur and strength to the building. Color, texture and form, the most important visual elements, are applied in order to induce grandeur or strength of the building. Later, this approach was used in other buildings. The Shrine Grand Mosque, Located in twenty-one kilometers south of Herat (887 AH) is one of the buildings (Fig. 3).

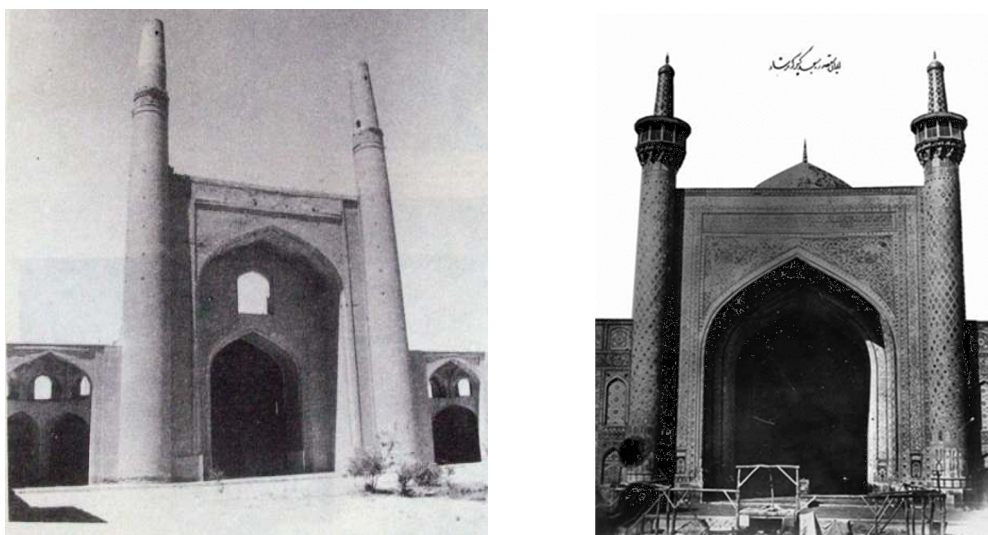


Fig. 3- Right: Goharshad Mosque with tower-shaped minarets is one of Qavam al-Din innovations. Left: Ziarat Mosque following Qavam al-Din. The Photo of Goharshad Mosque from: the holy threshold of Imam Reza. The Photo of Ziarat Mosque from: A book of Timurid architecture in Iran and Turan.

2- Change in design of a popular house's dome: up to this time, the dome of home was usually a square-shaped room where was separated from the porch by a retaining wall and the dome was located over it. Qavam al-Din applied his most daring ideas in Grand Mosque in Mashhad. An idea that was provided a large and open space for worshipers in addition to make light the structure. With a complete break from a well-rooted tradition of dome placement on the top of square-shaped house's dome, this dome has been established along the southern porch and at a distance longer than half of its length. (Donald Wilber 1378: 74), diameter of the dome is 10 meters. As can be seen from the outside, there is no a connection between the dome and massive cube of its brick foundation in terms of architecture manner. The northern part of the dome relies on qibla porch and its southern part relies on half-dome above a southern square of the main space. The southern half-dome that covers the roof of Mihrab & Minbar, is covered in white with a lot of very beautiful and the prolific *muqarnas* from a top of Mihrab to crown of an arch. The white color made undo darkness of space that is created due to much depth of space under the dome and its attachments. Some orientalists such as Donald Wilbur and Lisa Golombag criticized the great Mihrab due to lack of its human dimensions. But according to the author, largeness of Mihrab has been made purposely and in balance with other components of existing space. The arch, by itself, is a luxurious and normal one. Largeness of this arch control heaviness and hugeness of the above *muqarnas* to create an eye-catching view. Otherwise, it builds a Mihrab with a white marble within this arch to protect Mihrab humane concept like other Mihrab and it does not lose its traditional role. (Fig.5) "A genius architect, name of Qavam al-Din Shirazi completed the dome of a woman on the intersection of zigzag-shaped arches which started from the tomb of Goharshad in Herat and finished in Khargerd school in Khaf" (Galina Pugachenkova 1387: 45).

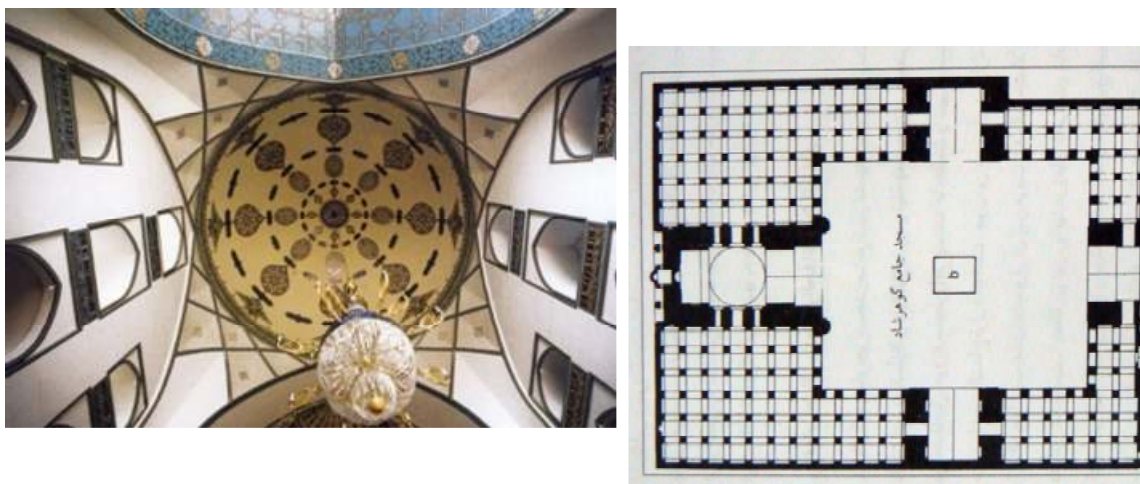


Fig. 4- Right: a plan of Goharshad Mosque and a position of the porch, the dome and the space of half-dome above Mihrab- Left: a position of the dome above four arches- a plan of Mosque from: Mosque book and endowments of "Goharshad"- Picture on the left from: public relations of the holy threshold of Imam Reza

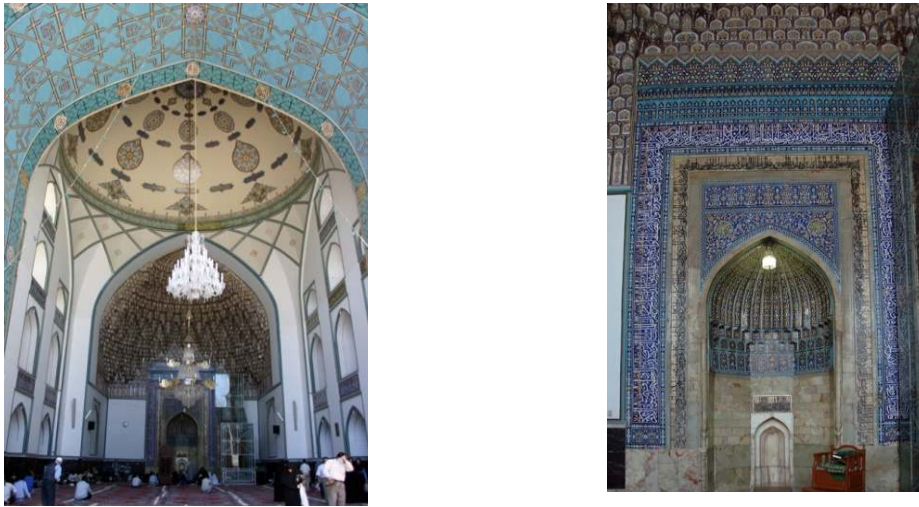


Fig. 5- Left: a position of the porch, the dome, half-dome and Goharshad Mosque Mihrab- **Right:** the main Mihrab where a heavy Mihrab is located within it.

3- Making a fenestral dais: This initiative is considered as other innovations of Qavam al-Din Shirazi. One could see this type of a royal seat in the tomb of Goharshad in Herat that is appear as a half-vestibule at the end of arches in western side of the tomb. Previously, location of this alcove led to create a gloomy space. But three windows started from the top of the plinth, facing the open space, create a bright and pleasant environment. Existences of the light cause a redoubled increasing of decorations that were used in a space of the alcove by a variety of techniques. In this space, a viewer could observe desired beauty of decorates and enjoy them. In addition to the tomb of Goharshad in Herat, this kind of the alcove was used in ghyasyh school Khargerd, the tomb of Khwaja Abdullah Ansari. There are many similarities between them (Fig. 6).

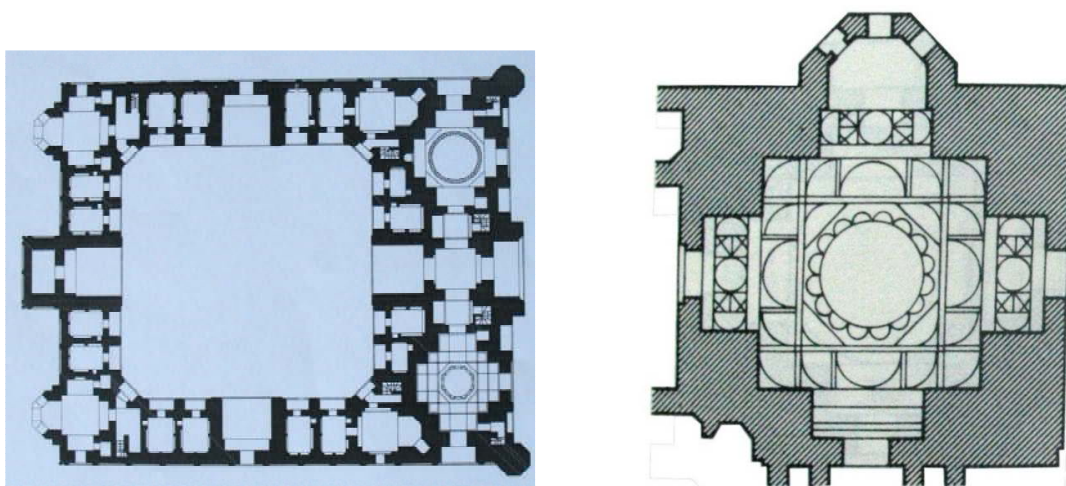


Fig. 6- Right: a plan of Goharshad's tomb in Herat with making a royal seat and three skylights- **Left:** ghyasyh school, re-showing a fenestral dais in a last work of Qavam al-Din Shirazi- a plan of the tomb from Timurid architecture in Iran and Turan- a plan of school from Documentation Center of Khorasan Cultural Heritage

4- Building monuments with making a view in several facades: usually, Islamic buildings except for the main façade relied on other around buildings and they were without viewing on other fronts. But, the tomb of Goharshad was located within an open area in monuments complex of Herat and the possible is made to design and implement windows facing an open space in addition to the main front. This innovation was placed the tomb on show in every direction. Therefore, all exterior facades were decorated by bricks & tiles technique and with a variety of brilliant colors, so the tomb's eye-catching is multifold. Later on, this feature was re-showed in ghyasyh school Khargerd and the tomb of Khwaja Abdullah Ansari.

5- Offering an innovative way for two covered domes: prior to Qavam al-Din, because the second dome is stable, a vertical thing was located on the apex of the dome. It was usually built by highly resistant woods. Other woods were used within a radius around this vertical thing that parts of the dome relied on him. One could see this approach in the dome of Gur-e-Amir in Samarkand. In this way, the interior dome bore much heaviness. But, Qavam al-Din left this approach and reduced he main burden of the interior dome by an innovative way. In this project, he first created a low altitude dome on the inner thin cover and then located it as a basis for the outer dome. It left behind a number of cadaverous redundancies on this base that external dome relies on them. These pivotal redundancies were firm by wooden timbers. For the first time, this phenomenon was observed in a stupa of Goharshad's tomb and later on, was repeated many times. Reducing the burden on the inner dome provide a possibility to an Architect use a variety of decorative arches which have generally a little depth. Low-rich bowls which have established a more evident balance with other components of a buildings and eye-catching decorations are applied in them. In fact, these domes leave a backer position and receive a more aesthetic and visualization position. Khargerd twin domes present other examples of this type of initiative.

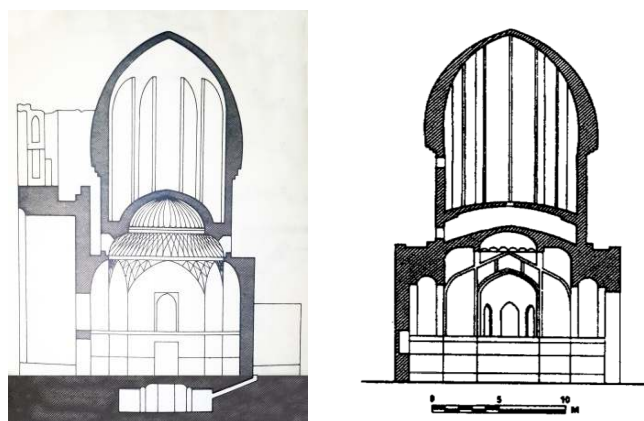


Fig. 7- Right: the tomb of Goharshad in Herat, Left: the tomb of Abu Nasr Parsa in Balkh, Schematic representation of the structure and papaverous redundancies. Holder of the outer dome, in the tomb of Abu Nasr papaverous things relies on the inner dome, but in the tomb of Goharshad, their base has been removed from the thin inner dome. Qavam al-Din's initiative to remove the main burden from the inner dome, reference: a plan of Goharshad's tomb from: Donald Wilber, Golestan e Honar, Num,13. a plan of Abu Nasr's tomb from: Lisa Golombag and Donald Wilber from: Timurid architecture in Iran and Turan.

6- Diversity in establishing Dome-chamber in covering space with *resmi bandi*: diversity of elements involved in creating a work of art, especially in the same spaces is one of visual characteristics in art-works. One of initiatives of Qavam al-Din is to establish diversity in roofs using *resmi bandi*. A roof of Goharshad's shrine and mosque & school in Khargerd are examples of this artistic performance. One can observe the summit of his work in two symmetric house's dome in Khargerd building. Although these two spaces have a same size and symmetry, are covered by two different techniques of an official scheme. Making an arch has more advanced in school in comparison to mosque and it is quite different visually. One can observe even tendency to variety of Qavam al-Din in his works details, for example: although using a technique of making an arch in school and tomb of Goharshad is the same one, decorations are applied to them presents a completely different images. A difference that has changed one into a tomb of a blessed lady and has changed other into a place to learn science and argument of seminarians.



Fig. 8- Right: the dome of a school in Khargerd. Left: the dome of Goharshad's tomb in Herat- an eye-catching innovation of Qavam al-Din in using similar official schemes with two different decorations which has different expressions- A photo of school from: the author. A photo of the tomb from: book of Timurid architecture in Iran and Turan

7- Extensive use of mosaic faience: using mosaic faience, extensively, and with various techniques is another feature of an architecture style of Qavam al-Din. Perhaps, his noteworthy use of mosaic faience in the buildings is a most effective work of Qavam al-Din. One can observe a variety of technique in decoration of Goharshad mosque in Mashhad. In an administrative standpoint, a facade presents one technique and a cover of minarets has other method. In these periods, development of constructing was justified the use of prefabricated ornaments. On one hand, mosaic faience makes possible work on any surface and on the other hand adds to develop decoration. More importantly, it is also possible to combine it with other materials like integration with stones that are seen frequently in Qavam al-Din's buildings. The use of color has a richly coloured appearance in the buildings of Qavam al-Din both as a visual element and as a symbolic element. On one hand, azure and turquoise are seen as coordinators of gray worm's colours in an interaction harmony, on other hand, they have a role in decorations as heavenly symbols.

The presence of these two colors is very evident in Qavam al-Din's buildings both in terms of a form variety and in terms of levels extent. These primary colors are so intertwined and have been harmonized with white, yellow, coppery, black, green, gray and slightly pink; one could compare them with beautiful illuminations of his contemporaries. These ornaments like their matches that were used to decorate the Holy Quran, has decorated verses and narratives inscribed on body of the building.

8- Using visual power of line to create a sense of height: One of evident initiatives of Qavam al-Din is to create a height in buildings that do not have much height, using visual power of line. A high altitude is a characteristic of Timurid monuments that founders have paid attention to it. Qavam al-Din could visually give a height to the buildings, by applying vertical parallel lines that are not interrupted along with any horizontal line. This task has been made by these two following methods:

A: creating narrow pillars in facades, For example; highlight brick layers and tiled margins in an interior facade in ghyasyh school Khargerd and the complex of Goharshad in Herat.

B: Making arches that cover two floors of the building, without being interrupted by another horizontal motion like exterior facades in ghyasyh school Khargerd (Fig. 9).

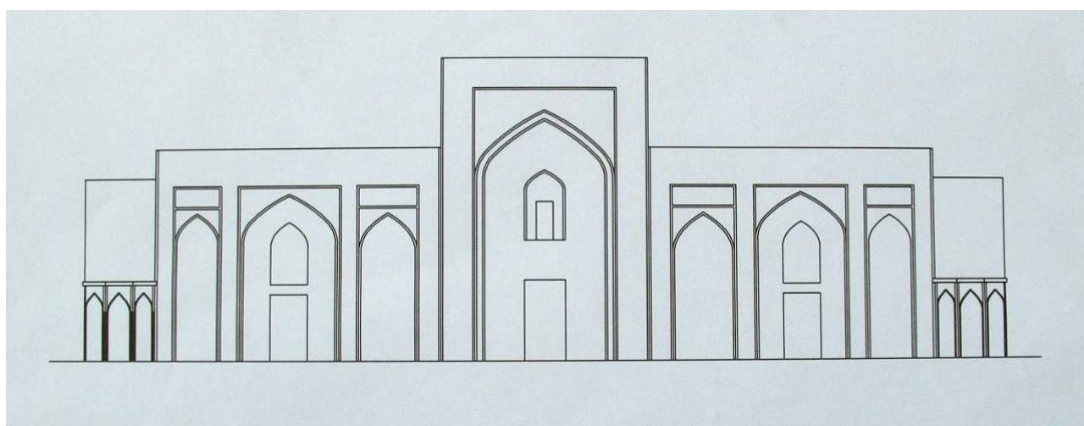


Fig. 9: the main entrance façade in ghyasyh school Khargerd. Arches that are covered a height of each two floors. The plan from: Documentation Center of Khorasan Cultural Heritage

9- Preparing diamond-shaped grounds with low-lying bricks in the cover of minarets: in these minarets, by using low height bricks were created regular diamonds that are evident in most of Qavam al-Din's buildings. A background of diamonds that usually has decorated with mosaic faience, contain the names of God. Created levels gives additional strength to the minarets, in particular these levels relies on the basis of zigzag-shaped firm arches. They are considered as most important load-bearer arches in architecture. Vertical lines of Kufic inscriptions in the leg of minarets reinforce this aspect. This method is peculiar to Qavam al-Din.

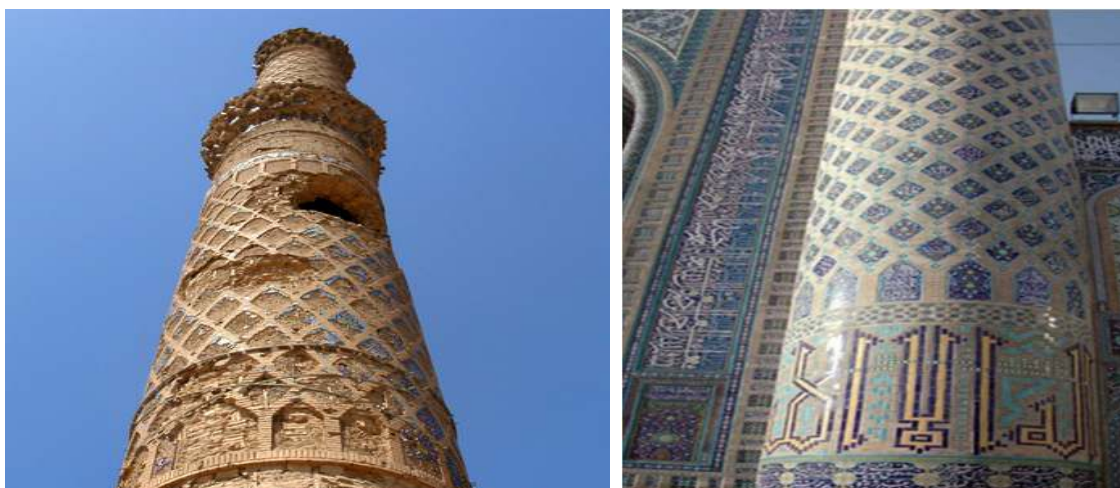


Fig. 10- The use of mosaic faiences' brick in body of minarets- Right: Goharshad Mosque in Mashhad, photo from: the author- Left: the complex of Goharshad's minaret in Herat- photo from: Google earth

10- Design change in corners of a plan to hide Stairway: Qavam al-Din was used sensible solutions for creating most beautiful parts in the building and presenting appropriate images. One of elements that show his interest in pleasing harmonizations and presenting appropriate and eye-catching images is seen in Gazorgah building. For the first time, in this construction a corner of the courtyard is disconnected by diagonal walls to be constructed in their behind stairways and corridors to reach other parts of the building. After this, the solution has also been implemented in Khargerd. He eliminated sharp corners with 90 degree angles by this knowingly scheme and created a needed space for stairways and entrance to the corners of spaces.

11- Thoughtful conjunctions in decorative elements: conjuncting a stone and a brick with mosaic faience can create an eye-catching diversity both in texture's field and in color field. Qavam al-Din was used well this scheme for covering facades in Goharshad Mosque in Mashhad. Demonstrating blue tiles beside gray and rough color of bricks and elsewhere white color of polished stones in proximity to bright colors of tiles has created a pleasing contrast. This scheme in addition to diversity in applying decorative elements, presents beautiful visual effects of the building which over time has been praised by art experts. These ornaments were used in the façade of Goharshad Mosque and ghyasyh school. It continued in Mowlana Mosque in Tayabad.

12- A rhythmic alternation of doorways on both sides of the entrance porch: Increasing rhythmic doorways on both sides of the entrance porch are evident in most of Qavam al-Din's works. This scheme is another feature of his work that was used to create balance and visual strength. For example, this rhythm is seen as a small-big-small thing in the building of Goharshad Mosque and ghyasyh school Khargerd (Picture 9).

13- Escaping from darkness: Qavam al-Din made many efforts to guide light into architectural spaces. Removing the retaining wall between the porch and a space under the dome, use of white thick muqarnas in a space of half-dome over Mihrab in Goharshad

Mosque in Mashhad, making several windows in the dais made in the tomb of Goharshad and ghyasyh school Khargerd that led to change in these types of spaces and also creating Skylight (Wind catcher?) at the end of the southern porch in ghyasyh school Khargerd which for the first time is seen in Qavam al-Din buildings, are examples of guiding the light into Architectural spaces in his thought. Surely, in addition to displaying bright decorations made in these spaces, existence of the light has a pleasing show on architectural surfaces and bodies that adds to the beauty of the environment.

- **The last explanation:** Lisa Golombag and Donald Wilber say: Khargerd school is a best evidence for studying Qavam al-Din style. Because this amazing building is remained intact miraculously and a person could observe complexity of spatial structures as well as the elegance of decorative designs. So one could say that this work was the culmination of his activities and a reflection of Qavam al-Din's fabulous character (Lisa Golombag, Donald Wilber 1374: 259).

It seems essence of all artistic life of Qavam al-Din is manifested in ghyasyh school Khargerd. The cause of this matter can be summarized as follows:

A: all works of Qavam al-Din Shirazi were supported by founders who have a highest social and political position. The history suggests that Timur was involved in all details of the building. "There is a graphic from the time of Akbar Shah, shows Timur on the agenda" (Jacob, Daneshdoust 1359: 92). Also we know that he ordered to ruin the made arch that had no high according to his desire. Unfortunately, this task did not end with his death and it was continued during the reign of his children. For example, one can refer to the estrangement of Shahrukh with Master, Qavam al-Din Shirazi that led to produce calendar by him. Certainly, in such a situation, an artist can not express all his/her style. Therefore, he may change the unwanted parts of the building, for example; make a porch taller, or make a dome larger. So, considered proportions of the architect may be distorted and it has not an appropriate architectural style. Although remained evidence of Qavam al-Din architecture style, in this sense, is flawless and wisely, one can regard as an important event an order of construction to Qavam al-Din, a specific architect of the court by Khwaja Ahmad pir Khafi, a wise minister of Timurid Shahrukh. A blessed event that both the employer and presenter were the same benefit from it. On one hand, Minister Pir Ahmad was proud to have a great architect in the court to build a royal structure by his order and make eternal his name with the name of the time Sultan in the history. On one hand, it made an opportunity to the architect, Qavam al-Din who after many years of creation under orders of the state dynasty and gains much experience, he now design and build a construction without any order. But, if to be an order, he will have no force to obey it. Qavam al-Din took a maximum advantage of this ongoing opportunity to establish a structure that was a head of his buildings and a best part of Timurid architecture. This building has no exaggerated heights. All components of the building are systematic and balanced. It has not been found any negative comments on the building in the works of researchers. The building is sturdy, balanced, equable and unassuming. Despite a variety of complex decorations, in terms of the work method and materials in use, especially applying various arches that some of them were used for the first time, the building is

integrated and balanced and no character is manifested more than they need. According to conducted studies, the building has a complex formation and an impressive, very balanced and an eye-catching fitness. A geometric analysis of the building indicates that golden dimensions and pure beauty are hidden in its components. According to Pope: "it is a unique and so equable building that was designed by Qavam al-Din and was built by Ghiyāth al-Dīn Shirazi" (Pope 1366: 197). Therefore, if characteristics of this building to be considered, it is sufficient to regard Qavam al-Din as an artistic architecture who was used principles of visual arts to achieve pure visual effects knowingly and willingly.

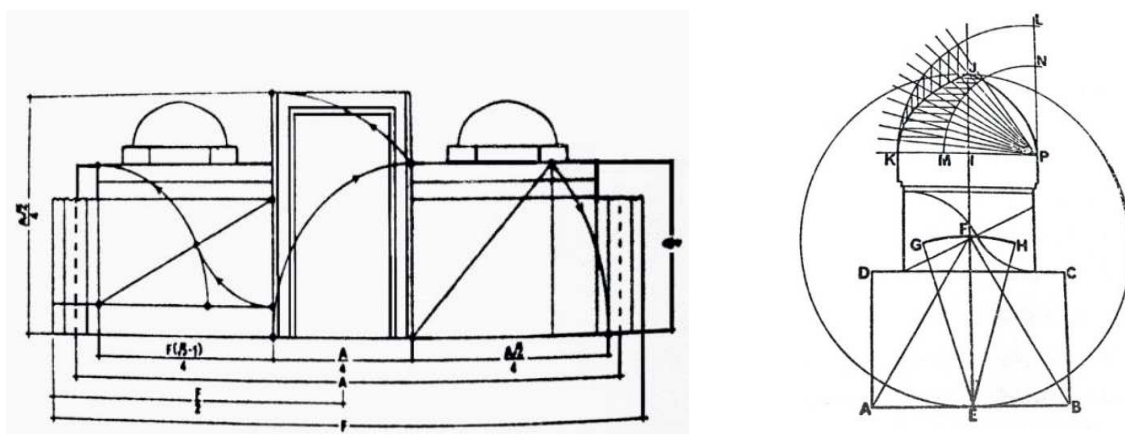


Fig. 11: fitting golden sizes in designing the building. Right: Herat, Goharshad school, Geometric analysis of cross section. Left: ghyasyh school Khargerd. Reference of designs: Timurid architecture in Iran and Turan

CONCLUSION AND DISCUSSION

Timurid architecture that got established in Samarkand by artistry of Iranian architects and with a theme of Azeri style was stopped due to Timur death. But Iranian architects especially Qavam al-Din Shirazi, helped to attach this chain and continue in Khorasan with a significant change. The most important monuments of this period were built by Qavam al-Din Shirazi. Studying visual particularities in these buildings revealed features that for the first time have been created by innovating Qavam al-Din, have been repeated in most of buildings and have been perpetuated in an architecture style after him. In this paper, for instance, the author referred to at least thirteen of them and was explained them.

Table for titles of visual effects of Qavam al-Din Shirazi and monuments that have these effects

Number	Title of studied effects	Monuments that have these studied effects
1	Designing tower-shaped minarets at the level of ground	Goharshad Mosque in Mashhad, the tomb of Goharshad in Herat
2	Change in design of the dome of house	The tomb of Goharshad, Goharshad Mosque in Mashhad, Khargerd school
3	Making a fenestral dais	The tomb of Goharshad, the tomb of Khwaja Abdullah Ansari, ghyasyh school Khargerd
4	Building monuments with making a view in several facades	The tomb of Goharshad, ghyasyh school Khargerd
5	Offering an innovative way for two covered domes	The tomb of Goharshad in Herat
6	Diversity in establishing Dome-chamber in covering space with an official scheme	The tomb of Goharshad, Goharshad Mosque in Mashhad, School and Mosque in Khargerd
7	Extensive use of mosaic faience	The tomb of Goharshad, Goharshad Mosque in Mashhad, ghyasyh school Khargerd
8	using visual power of line to create a sense of height	The tomb of Goharshad in Herat
9	Preparing diamond-shaped grounds with low-lying bricks in the cover of minarets	The complex of Goharshad in Herat, Goharshad Mosque in Mashhad
10	Design change in corners of a plan to hide Stairway	The tomb of Khwaja Abdullah Ansari, ghyasyh school Khargerd
11	Thoughtful conjunctions in decorative elements	The tomb of Goharshad, Goharshad Mosque in Mashhad, ghyasyh school Khargerd
12	A rhythmic alternation of doorways on both sides of entrance porch	Goharshad Mosque in Mashhad, ghyasyh school Khargerd
13	Escaping from darkness	The tomb of Goharshad, Goharshad Mosque in Mashhad, ghyasyh school Khargerd

The fact is that the created change led to development of Iranian architecture and made eternal Iran and name of Qavam al-Din around the world. These features prove a new perception in architecture of Iran as unique and undeniable characteristics.

Suggestion: according to resources that have been published about him and opinions of many of expert researchers, architecture style of Qavam al-Din has many subtleties and techniques. Yet, these characteristics have been described by nice words and phrases and Except for a few signs, analyzing and investigating many features are not made. This paper was adjusted and provided in the light of ability of the author who is active in the field of traditional arts and is affected by visual characteristics of Qavam al-Din's buildings. Therefore, it includes only a small part of the architectural specifications of Qavam al-Din. It is related to a building outside and is noticeable for observers. So it is recommended, dear architects with their profound attention, explain and introduce to the world other features of this noble Iranian architecture that have been hidden from the eyes of ordinary people in the light of other architectural aspects of Qavam al-Din, especially Structural features and technical specifications.

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