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A case study on the influence of geometry and symbolism in Islamic Art with reference of Muslim's religious Beliefs

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Abstract

This paper aims to discuss the role of mathematics in the emergence of Islamic art. Islamic art is known for its geometrical patterns, decorative art and calligraphy. It is believed that the highly geometrical patterns is a result of the Quranic prohibition of making living beings. On the other hand, many researchers believed that Islamic artists got influenced by the platonic beliefs to adopt geometry to symbolically describe their ideas.

This research investigates the reason behind the great influence of geometry used to produce symbolism in Islamic art and architecture without replicating nature into artworks but to describe natural laws into geometrical forms with the reference of Quran. This paper shed the light on another perspective into this matter that Muslims were highly influenced by their religion and they practiced it not only in daily life but in art. They used Quranic descriptions of paradise to build heavenly gardens around the structures. The purpose of these ideas were to glorify Islam among other nations and to preach God's message.

Keywords: Aniconic Art, Islamic Art, Mathematics and Symbolism, Geometric Patterns, Religious impacts on Art.

Resumen

Este artículo tiene como objetivo discutir el papel de las matemáticas en el surgimiento del Arte Islámico. El Arte Islámico es conocido por sus patrones geométricos, arte decorativo y caligrafía. Se cree que los patrones altamente geométricos son el resultado de la prohibición coránica de crear seres vivos. Por otro lado, muchos investigadores creían que los artistas islámicos fueron influenciados por las creencias platónicas y adoptaron la geometría para describir simbólicamente sus ideas.

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Esta investigación busca la razón detrás de la gran influencia de la geometría utilizada para producir simbolismo en el arte y la arquitectura islámicos sin replicar la naturaleza en obras de arte sino para describir las leyes naturales en formas geométricas con la referencia del Corán. Este artículo arroja luz sobre otra perspectiva sobre esta cuestión: los musulmanes estaban muy influenciados por su religión y la practicaban no sólo en la vida diaria sino también en el arte. Utilizaron descripciones coránicas del paraíso para construir jardines celestiales alrededor de las estructuras. El propósito de estas ideas era glorificar al Islam entre otras naciones y predicar el mensaje de Dios.

Palabras clave: Arte Anicónico, Arte Islámico, matemáticas y simbolismo, patrones geométricos, impactos religiosos en el arte.

1. Introducción

Mathematics plays a prominent role in Islamic art. The presence of geometrical patterns can be seen everywhere in Islamic architecture and illumination. It is believed that geometric patterns reflect the infinite nature of God (Dewji, 2016: 03). Numbers, patterns and math were not new for humans but Muslims took them differently and used them to create a unique style of art. Muslims were not the first ones who used geometry in art but the Greeks and Romans do have geometrical forms in their artworks like the *Corinthian capital*, the *tower of winds* and the *Colosseum*. And after the arrival of Islam in these states around 9th century the representation of human and animal forms also have created by Muslim artists or Muslims commissioned the artworks, like *Tympanum with a Horse and Rider* which belong to the 14th century, the *Panel with Horse Heads* from the 11th century, and *Animal Flask* from the late 7th to 8th century but the usage of geometrical patterns were always been dominant among all art forms (The Metropolitan Museum of Art, 2022: 03).

Many Muslims believed that it is because of the prohibition to drawing humans and animals in Islam and the researchers claimed that it is one of the reasons behind the emergence of complex and repetitive geometrical patterns to avoid human forms (The Metropolitan Museum of Art, 2001: 03). David Wade mentioned another reason in an essay entitled, *Why Geometry? Reflections on the decorative arts of Islam*. Greek Classical and Hellenistic teachings along with Plato and Aristotle's philosophies including Neoplatonic ideas which were still being taught in the region in the late seventh century CE. When the Muslims entered Egypt and Syria, they were inspired by their civilized life and they translated the Greek teachings into Arabic. And it might be possible that they got influenced by Greek philosophers, Platonism, and Mathematical theories naturally. And they started using these philosophies and ideas in art (Wade, 2022: 03). There is another point of view according to some researchers that the Muslims wanted to reflect the universe through art, and mathematics is a universal language, so they used the spiritual representation of objects and beings, not focusing on their appearance (Dabbour, 2012: 03). But whatever the reason could be, it is considered that mathematics has been a dominant feature in

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Islamic art, it had great impacts on Islamic art and architecture and many researchers discussed the topic under different sects of mathematics and architecture.

Ahad Nejad Ebrahimi, Morteza Aliabadi discussed the strong relationship between mathematics and architecture, and architecture can't be done without using geometry. It means that mathematics is necessary for the creation of architecture. It has been used in pre Islamic era and after the arrival of Islam, mathematicians were commissioned to architectural projects due to the lack of craftsmen and architects under the caliphate of Abbasids. Thus the developments in science and mathematics are directly connected to the evolution and formation of architecture in Islamic art (Ebrahimi and Aliabadi, 2015: 04).

Hourieh Mashayekh's article further supported the argument about the impacts of mathematics on Islamic art and her article concludes that mathematics and advanced geometrical techniques were used to achieve perfection aesthetically while maintaining the sustainability of structure, and it was not possible for an ordinary architect to achieve such kind of beauty but an architect with a great knowledge of mathematics, science, astrology, poetry, and philosophy. Mashayekh further concluded that mathematics wasn't used only in the building structures but in the designs on the entrance of Friday Mosques in different places, for example, the height of Minarets at the entrance of Masjid-I-Jami, at Yazd would not have been achieved without mathematical knowledge and structural analysis and it is the only way to achieve the poetic beauty, monumentality and perfection and the height for such Minarets also symbolizes the path to paradise (Mashayekh, 2005: 04).

The architecture in Cordoba built by Umayyads in 8th century is another example of Islamic architecture in which mathematics was in deep focus. They employed architects to design ground plans, elevations, decorative patterns in the reference of human measurement just as the Vitruvius man.

Felix Arnold discussed that in Islamic architecture the architects kept the unity in focus and made every part equal to each other to create symmetry and a unified space as a whole as unity has great importance in Islam as mentioned in several places in Quran.

> Hold fast together to the cable of Allah83 and be not divided. Remember the blessing that Allah bestowed upon you: you were once enemies then He brought your hearts together, so that through His blessing you became brothers. (Qur'an, 3:103)

Thus, unity was created symbolically through art. The advancements in mathematics in the 9th century developed in architecture in 10th century and introduced a new term 'Mathematical Turn' in Islamic art. Thus all these advancements in the field of mathematics made it possible for the Muslims to set geometrical ratios in architecture that led to the later periods of Renaissance and Gothic architecture. These ratios were used to divide the object equally to show the unity in design (Arnold, 2018: 06).

The accuracy isn't possible to achieve without the help of mathematics, Raymond Tennant described how the mathematical theorems worked in the tile work of Islamic

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architecture to achieve structural and aesthetical accuracy. During the 10th century, Islamic mathematician and astronomer Abu-l-Wafa participated in the discussion of constructional designs, tiles, and other materials in the meetings held in Baghdad. He delivered his mathematical knowledge to the artisans and taught them to make several constructions by using a rusty compass and a straightedge. These teachings helped the architects to use bisecting angles, make a circle out of a square, divide segments into equal parts, etc. The craftsman wasn't aware of these formulas and ratios but the collaboration between artists and mathematicians like Abu-l-Wafa made it possible to create highly symmetrical ornamentation on tile work and other architectural structures which we have seen around the world today (Tennant, 2003: 06).

Geometry wasn't only used for ornamentation but for another important purpose in Islamic art. It is a universal language, linked with nature and has a deep connection with Islamic cosmology and symbolism as Islam itself is a universal religion as mentioned in Qur'an: "All praise is due to God alone, the Sustainer of all the worlds" (Qur'an, 1:2)

Loai M. Dabbour has described the connection of geometry with Islamic pattern designs and how the proportions play an important role to regulate the order of pattern, which will interact with the viewer to make him understand nature, humans, and the universe. These geometrical proportions are the basis of sacred geometry and have linked with Islamic cosmology, metaphysics and philosophy. The geometry used in Islamic patterns is more than just for the sake of decoration; it gives a chance to the spectator to connect with the spiritual meaning hidden within it. These Islamic patterns were the inspiration by nature and created by the strict geometrical rules to follow the natural pattern (Dabbour, 2012: 06).

Islamic religious beliefs and Quranic verses have been depicted symbolically in the architecture and many illustrated examples have been witnessed in the article of Dr. Ibrahim M. O. Abu A' mar such as the Umayyad Mosque in Damascus.

He used the term 'Religious Symbolism' to further explain the use of water, colors, plants, and other elements with their symbolic representation as celestial places with references to the Quran. Sufi art belongs to physical representations, on the other hand Sunni art representations belong to graphical work. The Dome of the Rock is another example of symbolism in art by the use of geometrical shapes, the hemispherical Dome is a representation of the universe while the quadrangle structure which supports the dome is a representation of heaven and earth. It's a way to connect the soul with the eternal world. The highly used symbolism is mainly a way to depict the heaven as Dome and the earth as supporting structures (Abuaemar, 2017: 07).

Another geometrical symbolic example we have seen is Jamia Masjid at Yazd which has a commonly used element of star either it's a 6, 8, 10, 12 or 16 corner star it has made with equal divisions of a circle and each corner symbolizes a direction. The central point of the star is the same as the central point of the circle from where it sprouts out which depicts that the circle is the base of all other patterns, it has an infinite nature, and there is no start and no end (Cbomers, 2011: 07)

All of the above literature concludes that geometry is a base for Islamic art and architecture, we have witnessed several examples where symbolism was used either

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physically or graphically. Within this symbolism, geometrical symbolism was used as a main tool to convey the spiritual meaning to the spectator. Symbolism in Islamic art has been a dominant feature among all art forms whether it is an art of illumination, calligraphy or the jaali work in architecture and every geometrical shape, pattern, and the numbers used in this art form do have a symbolic meaning and has a different representation towards Muslim religious beliefs.

Mathematics has a wide range of subjects like numbers, geometrical shapes, proportions and patterns, it is assumed that three main dominant mathematical features are directly connected to Islamic art such as geometrical patterns as used in the jaali work in Mughal art for example, the complex of Humayun tomb (Shekhar, 2022: 08). The geometrical shapes for example a circle, is a symbol of unity and infinity which are directly connected to the infinite nature of God (Dewji, 2016: 08). Lastly, the numbers are symbolically associated with religion and art, for example the octagon is used in Islamic buildings either it's a minaret or a dome, it symbolically represents eight angels who are carrying the throne of God (Edubirdie, 2022: 08).

Thus this paper aims to examine the importance of mathematics in Islamic art under the consideration of Muslim's religious practices, and it's deep connection with geometrical patterns, the origin of its formation, and how the Muslims got influenced throughout the history. This paper also discuss the significance of numbers in the Islamic world and the formation of art through symbolism. Muslim's religious beliefs will be in focus which took part to formulate this art form.

2. Symbolism of geometrical shapes in islamic art

Shapes have been used purposefully as symbols, it wasn't the Muslim's idea to use shapes as symbols but there are many other examples where shapes have been used to depict something symbolically. The circle which is believed to be the base of creation used by many artists from different civilizations. Ancient Greece, Rome, Hinduism, Buddhism and Christianity used circle with different representations such as at the top of the head of Egypt solar deity Ra to depict Sun (Magher: 09), in Roman art it has been used with the rays at the back of the heads of heroes to show their divine powers (T. Editors, 2018: 09), in Buddhist Art it was at the back of Buddha's head as Halo to show his enlightenment (Original Buddha: 09), in Hinduism circle has been used as Mandala, which is a representation of the world and used in sacred rites in Hindu culture (T. Editors, 2023: 10). In Islamic art Halo has also been used for religious purpose with flames to show Prophet Muhammad (PBUH) (Original Buddha, 10).

Rather than the use of Halo, the shape of a circle is the most common geometrical shape in Islamic art and it is a base of many other creations. The division of this single shape makes hundreds of shapes such as division of three circles makes a triangle and when expanded it makes further polygons.

Keith Critchlow defined the use of point as a symbol to create a line to form a circle with an arch, with the use of three circles the first polygon which has been created

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is a triangle, the minimal expression of an area. While increasing the amount of circles, further polygons will be created like hexagon, pentagon, octagon, when repeated it will create a pattern (Crithlow, 1976: 10).

The circle is a symbol of unity and shows diversity in creation (Moradhun: 11). It associates with the infinite nature of God as it has neither a start nor an end, the circle itself is a representation of the Muslims religious belief of Tawheed, the oneness and singularity. It is a symbol of completion, wholeness, unity, and contains a world in itself, there is no need for any other element to complete it (Editorial Staff, 2023: 11). Further divisions of circles and repetitions of patterns creates many other Islamic patterns. Division of three circles makes a triangle, which represents the three basic biological functions of a human being, ingestion, digestion, and excretion, the division of four circles makes a square which represents the four elements of nature, water, earth, fire, and air, and a hexagon is close to a circle, near to perfection and is a depiction of heaven. Further representations of seven, eight and nine has also been witnessed in several Islamic architecture, which has been made through the repetition of these basic shapes. When these shapes are connected with the vertices of each other and used repeatedly, it will give birth to several basic Islamic patterns (Mahina and Arslan, 2018: 11). Unlike other artworks Islamic artworks are not the depiction of personal perception but it has a spiritual purpose. Architects didn't have the signatures on the artworks, thus all the artworks were for the sake of eternal and the divine love for Allah.

In Islamic art and architecture geometrical patterns and designs have been a dominant feature through the ages than any other art form and it makes people wonder why the Muslims were so influenced by geometrical shapes. It might be possible that they have another purpose: to geometry the significance of numbers in their lives.

3. Symbolism of pattern in Islamic Art

Patterns have been used by nature everywhere around the universe. The spiral of a snail, web of a spider, pattern of a snowflake, the structure of a DNA, the pattern in which the birds fly and every single particle does have a pattern to follow the right direction of nature. Behind all these patterns, the geometry is the base, the foundation of all the structures and creations of this universe. In Islamic art the most common thing we used to see is a pattern, repetition and a flow, an infinite pattern which shows the infinite nature of God or his creations. It has also been used in arabesque technique which is used to decorate in the illumination of Quran. These patterns and designs have symbolic meanings and a purpose to be used in architecture and in the illumination. In arabesque technique, the biomorphic patterns are an inspiration from nature, the leaves and spirals which have three main elements. The first one is spirals which symbolizes the growth towards light. Symmetry and structure which symbolizes unity, completeness and perfection. Balance and harmony which symbolizes the flow like a sea. Similarly in Islimi designs geometrical patterns has been used as floral and vegetal patterns all around the world (Williamson: 12). These natural elements are the celestial components of paradise which linked with

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religious belief on the Day of Judgment which is mentioned in Qur'an: water, trees, plants and architecture. For example in the following verse:

> Of course there are, during the creation of sky and earth, in the rotation of night and day, on the ship which sails in the sea and which people take benefits from, in the water Allah sends from de sky to give a new life to a dead land, in the way all kind of creatures disperse through that land, in the change of winds' directions and clouds stuck between earth and sky too, signs for those people who can understand (Qur'an, 2:164).

3.1. Paradise Depiction

The structural representation of the components can be seen in the *Patio de la Acequi*a in Granada which was also discussed by Torres Balbás, he referred towards the lush green gardens, flowing streams which has mentioned several times as a depiction of paradise for the blessed ones in the Holy book of Quran. Patio de la Acequia has been built to fulfill the requirements to make a structure of what has been mentioned in Quran as *Jannah* (Paradise), according to the scholars the purpose was to make a reflection of paradise what has been described in Surah Az Zumar in the following verse:

> But those mindful of their Lord will have ˹elevated˺ mansions, built one above the other, under which rivers flow. ˹That is˺ the promise of Allah. ˹And˺ Allah never fails in ˹His˺ promise (Qur'an, 39:20).

The artisans of that time wished to make a structure like paradise, and it was a visual representation of their passion. The inscription on the palace says about the gardens, "as beautiful as a Bride". Beside this structure, the presence of natural elements, gardens, water and the huge minarets are common in most of the Islamic architecture to showcase what has been described in Quran as Jannah.

3.2. Celestial Elements

The artisans wanted to depict the Quran through their artworks either in architecture or in the illumination of Quran. Unlike the general depiction of the paradise the artists used several celestial elements like specific fruits, trees and animals to make it similar to what a real paradise would look like. Palm trees are the most common element used in several Islamic structures and also has mentioned in Quran in the following verse:

> Would any of you wish to have a garden with palm trees, grapevines, and all kinds of fruits with rivers flowing underneath and as they grow very old with dependent children, a fiery whirlwind hits the garden, burning it all up? This is how Allah makes His revelations clear to you, so perhaps you will reflect. (Qur'an, 2:266).

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A celestial fruit pomegranate which has been depicted in the Dome of the Rock, besides these two elements there are the representation of olives and grapevines (M. O. Abu A'mar, 2017: 13).

Besides these structural pattern depictions of the architecture, there have been several examples of the geometrical patterns used in tile work and in the illumination. The basic plan and most common thing that a person can witness is the repetition and a flow which symbolizes the infinity in designs that is also a part of Muslim religion.

3.3. Infinity

Tasha Brandstatter has also referred to the concepts of Islam which have been the part of Islamic patterns. The Infinite nature of God has a symbolic representation which can be seen in the repetition of patterns. This repetition also described another concept of Islam that God is everywhere. And here another perspective can be mentioned that the God is unknowable and behind the approach of human mind, so the use of abstraction in geometry dissolves the connection to the physical world and these patterns built a link between the souls and the spiritual world (Brandstatter, 2017: 14).

3.4. Unity and Order

Nimira Dewji has also made a reference towards the use of Islamic religious concepts through symbolic patterns. According to her in Islamic patterns the importance of unity and order can also be witnessed throughout Islamic architecture. The use of complex geometrical patterns, arrangements and combination of various shapes developed a symmetry in design which leads towards singularity as a whole which is also an important element to enter into this religion which is tawheed. The use of pattern in the Domes of mosques made a visitor to be inspired unconsciously by the boundless nature of God. These patterns were made in a circular way with the use of geometry as the circle is a perfect form which symbolizes infinity, not only circles but in the illumination designs, the rhythmic curves also depicts infinity and a never ending circle. In these arabesque patterns the growth of leaves out of one another instead of a single stem symbolizes the unity as a community (Dewji, 2016: 14).

> And hold firmly to the rope of Allah all together and do not become divided. And remember the favor of Allah upon you - when you were enemies and He brought your hearts together and you became, by His favor, brothers. And you were on the edge of a pit of the Fire, and He saved you from it. Thus Allah does make clear to you His verses that you may be guided? (Quran, 3:103)

3.5. Beauty

In Islamic art the word cosmos has been used several times to describe the geometry and other Islamic architecture. The word cosmos means adornment, and the word cosmetics

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which we use today for beauty products is actually derived from cosmos. In Islamic art and religion beauty is believed to be an important perspective of Islam as it is quoted in a hadith:"Allah is beautiful and he loves beauty." (Sahih Muslim: 265)

And this is one of the concepts that the Muslim artisans used to achieve perfection instead of replicating the nature they used geometry to convey what it represents. This beauty concept also lead the artists to make their writing stylized which resulted in calligraphy (Hussain, 2009: 15).

3.6. Symmetry

Symmetry is as important as the geometry itself in Islamic art, it is used everywhere, every region, every time period of Muslim community. We can see it in the Islamic architecture, arabesque pattern and in the calligraphic scripts. Symmetry used to play a role to link, to make a connection to form a group. This symmetry also works to show the connection between the Muslims of different nations to connect them into one community which we have witnessed today that the Islamic art has its own identity due to the uniqueness of the designs that make it stand out among others (Rózsa, 1986: 15).

3.7. Complexity

Islamic patterns seem to be filled with complexity and are difficult to draw but when we learn the technique we realized that it has been created just by two simple tools: a ruler and a pair of compasses. Eric Broug referred to the technique in a TEDEd just by starting with a circle to equally divide it into parts to make several other patterns (Broug, 2015). The concept behind it is similar as the creation of God, at first it seems simple and beautiful but deeper inside it is complex and unknowable.

> [This is] a blessed Book which We have revealed to you, [O Muhammad], that they might reflect upon its verses and that those of understanding would be reminded. (Qur'an 38:29)

4. Symbolism of numbers in Islamic Art

Nature is full of patterns and numbers, from a DNA pattern to a minute particle in space, mathematics is everywhere in the universe, every number and pattern does have hidden meaning and a coded message for the ones who want to understand it. It is quoted in Quran in Surah Al Qamar: "Everything We created is precisely measured." (Al Qamar-49).

The universe follows a pattern and everything around us is organized and ruled by a unified power of God and this idea was flourished by many ancient civilizations like Egypt and Mesopotamians. Many researchers claimed that everything is based on the laws of sacred geometry, in the flower petals, rain drops, the chemical formulas and every single particle have a specific ratio, and these ratios are used by nature everywhere

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so the Egyptians followed the sacred geometrical ratios to build their structures to make a connection with the unworldly powers.

Besides ancient civilizations, every religion in the world has sacred numbers and shapes to follow a pattern, for example number 7 is believed to be the most sacred number in many religions, According to Bible God created the earth in 7 days.

> In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. And God said, 'Let there be light' and there was light.(Genesis 1:1-3)

The following statement goes on and God mentioned the creations of one day after another that show how in 7 days the world was created. In another place 7th day of the week has been described as Sabbath, a holy day.

> Observe the Sabbath day by keeping it holy, as the Lord your God has commanded you. Six days you shall labor and do all your work, but the seventh day is a Sabbath to the Lord your God. On it you shall not do any work, neither you, nor your son or daughter, nor your male or female servant, nor your ox, your donkey or any of your animals, nor any foreigner residing in your towns, so that your male and female servants may rest, as you do. (Deuteronomy 5:12-14)

In Hebrew number 7 is the most sacred number associated with the 7 pairs of clean animals on Noah's ark.

> You shall take seven pairs of every clean animal with you, the male and his female. Of the animals that are not clean, take two, the male and his female. (Genesis 7:2)

In Islam there are 7 rounds around Kaaba and 7 walks between Safa and Marwa while performing Hajj which we derived from the Sunnah of Prophet Muhammad (PBUH). In another place 7 seas are mentioned in Surah Luqman.

> "If all the trees on earth become pens, and the sea replenished by seven more seas were to supply them with ink, the Words of Allah would not be exhausted. Verily Allah is Most Mighty, Most Wise. To create all of you or to resurrect all of you is to Him like (creating or resurrecting) a single person. Verily Allah is All-Hearing, All-Seeing." (Luqman 27-28)

The number 7 plays an important role in Hindu religion as well. In Rig-Veda there are 7 parts of the world, seven seasons, seven heavenly castles. In their wedding culture the couple walks around the fire 7 times (Tolia, 2018: 17).

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Apart from religions there are other places which describe the importance of this specific number. 7 holy seasons, 7 days in a week and 7 musical notes. Not only the number 7 but there are several other numeric ratios in nature which are associated with different concepts and significance. But every ratio can be described under the laws of sacred geometry, and this concept is verified and discussed on many platforms by several researchers.

Dr. Hayam Mahdy Salama is one of the scholars who contributed to prove this concept. He said that the ratios in nature created by God had a significance on Muslim artists, they used their beliefs while making Islamic structures to reflect the concepts of God in the Quran through geometry. He further elaborated the golden ratios with the examples of Islamic architecture to prove the existence of sacred geometry. El Morsi Abu El Abbas Mosque located in Alexandria is one of the examples with the existence of a golden rectangle in the façade of the mosque. Minaret of the great mosque of Samarra is another example in which the artist used a golden spiral. Stellar Geometric motifs is an example of Islamic pattern which contain golden ratio consist of five pentagons around a circle in the center (Salama, 2019: 18).

5. Discussion

5.1. Implementation of Islamic Beliefs in Art

Muslims preached Islam in several ways from war to pilgrimage in different regions far away, likely they used art to encourage people to accept Islam. There are 5 pillars to be followed in Islam and the artisans of that time used them to promote Islam on different levels, those principles are Faith, Prayer, Fasting, Zakat, and Hajj. The first step is to believe in Oneness of God which is faith (Shahada) which is mentioned below: "There is no god but God, and Muhammad is the Messenger of God".

This belief of Muslims was the main focus of most of the artworks in different eras. They built mosques which are believed to be the house of Allah, and used to call and offer prayer. These Mosques were meant to build highly beautiful because it is mentioned in a hadith: "Allah is beautiful and he loves beauty" (Sahih Muslim: 265).

Not only mosques but other architectural structures have also been made attractive and charming. Beautiful gardens and streams were meant to build to look a like heaven of which imagery has been described in Quran in Surah az Zumar and many other places:

> But those mindful of their Lord will have ˹elevated˺ mansions, built one above the other, under which rivers flow. ˹That is˺ the promise of Allah. ˹And˺ Allah never fails in 'His' promise (Qur'an, 39:20).

This depiction of heaven showed their belief on the Day of Judgment which is another Islamic faith. To make these structures beautiful the Islamic artists used mathematics to achieve perfection, precise ratios were used under the supervision of mathematicians of that time to help the artisans in building those structures. The concept

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of mathematical ratios was another piece of interest to get significance as the word 'Al Hisab' (Calculation) has been used in Quran 48 times and covered several concepts widely for example in Surah Yunus it is quoted that:

> He is the One Who made the sun a radiant source and the moon a reflected light, with precisely ordained phases, so that you may know the number of years and calculation ˹of time˺. Allah did not create all this except for a purpose. He makes the signs clear for people of knowledge (Qur'an, 10:5).

In another place:

> Allah is the One to Whom belongs the kingdom of the heavens and the earth, Who has never had any offspring, nor does He have a partner in governing the kingdom. He has created everything, ordaining it precisely (Qur'an, 25:2).

In the above mentioned verses Allah motivated human beings to learn the art of calculation and used it in everyday life. And said that everything He created has a précised ratio. Thus this concept of calculation and précised ratios had an impact on the artists to make interior and exterior designs precisely within specific ratios and for this particular purpose they make highly geometrical patterns. For example the geometric patterns on walls and ceilings of mosques.

In these patterns there's infinity which shows the Infinite nature of God, Oneness and spirituality, which is mentioned in Quran in Surah Taha:"And [all] faces will be humbled before the Ever-Living, the Sustainer of existence. And he will have failed who carries injustice" (Qur'an, 20:111).

In another place it is quoted that:

> And do not invoke with Allah another deity. There is no deity except Him. Everything will be destroyed except His Face. His is the judgment, and to Him you will be returned (Qur'an, 28:88).

In the above mentioned verses of Qur'an it is clear that in Islam the infinite nature of God has another belief to being a Muslim. There is no start and no end of God and similarly the artisans used a circle to represent God symbolically as a circle also doesn't have a starting or ending point and most of the Islamic patterns have been made by the use of circles.

Abu Musa reported:

"The Messenger of Allah (ﷺ) was standing amongst us and he told us five things. He said: Verily the Exalted and Mighty God does not sleep, and it does not befit Him to sleep. He lowers the scale and lifts it. The deeds in the night are taken up to Him before the deeds of the day, and the deeds of the day before the deeds of the night. His veil is the light. In the hadith narrated by Abu Bakr (instead of the word "light") it is fire. If he

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withdraws it (the veil), the splendor of His countenance would consume His creation so far as His sight reaches." (Sahih Muslim: 179a)

In this hadith it is said that His (Allah's) veil is light/fire. Under the reference of Quran and Hadith the importance of light has been mentioned in several places and for this purpose the openings for the entrance of light in Islamic architecture can be seen in several architectural sites.

Allah is in the veil of light, He is everywhere but His creation can't see Him because of the barrier of light. He created this veil among his creations and Him to believe in Him while witnessing His creations all around. This idea of veil has been taken as inspiration for the Islamic artwork to show the Lord symbolically.

6. Conclusion

After cross checking the Islamic teachings and faith of Muslims with Islamic artworks, it is proposed that they considered their religion the main focus not only in daily life but also in art. And this belief of theirs resulted in the presence of highly symbolic geometry, the depiction of paradise in architecture, the beatification of writing and the interior patterns in their artworks. Thus the Quran and hadith references made it clear that in every aspect of their artwork there is an inspiration and a connection towards their religion. Apart from the belief of many, the prohibition to draw living beings, this paper lead towards another perspective that the Muslims were highly inspired by Islam and this inspiration made them took the ideas for artworks from their religion and the veil of light referred towards another perspective which is that Muslims of that time were free from the bondage of structure. They used geometry symbolically, they used circles to depict God symbolically, they built gardens and minarets to depict paradise symbolically, and similarly they were free from the bondage of structure and didn't make living creatures directly but through geometry. This freedom from the bondage of structure leads towards aniconic art and highly geometrical artworks.

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