

## Utilizing Islamic Geometric Abstraction Aesthetics in Creating Designs for Mosque Architectural Decoration

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### Abstract:

The study sought to establish the functional and aesthetic value of the relationship between sculpture and architecture. The success of an architectural work is dependent on the integration of the architectural work and its sculptural value, which is primarily dependent on the designer's understanding of the role of sculpture in architectural work. Architecture has become a rostrum for the art of relief sculpture, whether on the outside or inside of architectural structures. As a result, relief sculpture contributed to the enrichment of architecture with aesthetic values that combined form and content. The subject of the study is determined by the scarcity of studies on developing the appearance of mosque ornamentation through the use of geometrical abstraction. The research aims to use geometrical abstraction to create designs for use in the decoration of internal and external mosques. The inventive designs were transformed from two-dimensional to sculptural designs three-dimensional for use in the mosque. 23 designs were created using geometrical abstraction and converted into three-dimensional sculptural designs, and 10 designs were applied virtually on the inside and outside of the mosque using computer Programs. One of the most significant findings of the study is that geometrical abstraction can be used to create designs that suit all architectural formations used in architectural decoration inside and outside mosques.

### Keywords:

**Islamic Geometric Abstraction  
Aesthetic Designs  
Mosque Architecture  
Decoration**

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### Introduction

Art is considered a mirror for society and a way to recognize its civilization and progress, Islamic arts are considered among the applied arts that cared about the functional and aesthetical aspects, no one could overlook the original, aesthetical and substantial philosophy that filled the Islamic art, and Islamic architectural heritage is a bright sign for the innovation that Islamic civilization contributed with it in enriching the humanitarian civilizations. Islamic architectural art at its beginning was based on architectural, decorative elements that match its spirit, this art has been able to create pure and abstract visual vocabulary capable of expressing its speech and message related to its spiritual aesthetic needs and social concerns as a meditative art combining sacred and mundane. Also Islamic art has been characterized by its uniqueness from the rest of the arts by abandoning dealing with the spatial image and traditional pictorial simulation, as applied in some western religious and non-religious arts. To prevent idol worship, the application of accurate representations of living beings was particularly avoided in Islamic architecture. Therefore, vegetal motifs and geometric patterns were gradually

applied in Islamic art and architecture, geometric patterns became the most remarkable ornamental system in Islamic art and architecture (Clivenot 2000). Throughout history, Islamic ornamentation was the most characteristic to identify Islamic architecture. Despite its research and studies by Arab researchers and orientalists in its historical, technical, philosophical and other aspects, this art did not receive in-depth studies dealing with it as an art full of spiritual, intellectual and social dimensions that could be. From this specific point the research problem started are we able to find different style of ornament that refers to Islamic art, hence the selection the subject of this research, get benefit of the geometrical abstraction in creating designs used in the architectural decorative inside and outside mosques.

### The research problem

Despite of there are various research studies looking the architectural features and aesthetical values of Islamic architecture, research works concerning this architecture from the scientific and specialized perspectives are as yet restricted, This research investigates Geometric abstraction in Islamic arts that were applied Architectural Ornaments of masjids like embellishment, cornice,

friezes, columns, ceiling, walls and façades More unequivocally, besides that All previous research and studies condense on the Islamic ornament itself by focusing on the type, style, color and lineage as a traditional art that belongs to the Islamic culture long time ago. The research problem has crystallized in it tries to answer the followed questions:

1. How to employ Islamic art's use of geometric abstraction to create attractive patterns for use in mosques
2. Is it possible to use the creative decorative geometric pattern both inside and outside the mosque.
3. How to use Islamic creative traditions' artistic techniques as a source of modern creativity in the fields of design in general and developing architectural adornment in particular.
- 4- How effective is Islamic art's singularity in inspiring innovative concepts for mosque decoration?
5. What philosophical principles govern the Islamic Abstractism geometric Arts' aesthetics

#### The aim of study

- 1: benefiting from geometric abstraction at Islamic arts to create ornamental decorations for mosques and establish Islamic identity
- 2- Rooting of the concept of ornament functionality as a heritage and how to utilize them in a modern way under the shade of technological development.
- 3-Giving creative design solutions inspired by the Islamic geometric patterns to produce sustainable art work. as ornament of mosque
4. Highlight Aesthetics of Islamic geometric patterns and their contribution to the ornamentation of mosques and other Islamic

building .

#### Research significance:

- 1- Investigating the functional and aesthetical aspects of Geometric abstraction in Islamic arts
- 2- Studying the functional and aesthetical aspects of architectural ornament in Islamic architecture.

#### Islamic art

Islamic art is essentially derived from tawhid that is from an assent to or contemplation of divine cohesion. (Burckhardt, 2009) Islamic art comprises all visual arts created after the seventh century; it is not just religious art, it also includes art from the many diverse and rich civilizations of Islamic societies (Shafiq, 2014) Islamic art, since its inception has been able to create pure and abstract visual vocabulary that may express its message in relation to its aesthetic requirements (Blair and Bloom, 1996). Greek, Roman, early Christian, and Byzantine art forms, as well as Sassanian art from pre-Islamic Persia and Chinese influences, all had an impact on Islamic art. Islamic arts are regarded as being among the applied arts that were concerned with both the practical and aesthetic components, where Islamic civilization was distinguished by a philosophical intellect that characterized it from other civilizations.

(Burckhardt, 2009) the Islamic, architectural heritage is a promising sign for advancing the humanitarian civilizations. Islamic architectural art was initially based on structural and decorative elements that were in keeping with its spirit, as a result, most Islamic countries produced nearly identical architecture, with a few minor variations brought on by the local environment and the accumulated knowledge and experience of the population (Mallgrave, 2006)



Fig.( 1 ) Islamic art

#### Abstraction

The remodelling of natural objects is known as abstraction, then it's complete alienation from nature objects' styles. The height of this abstraction is considered to be abstractionism. Because abstract art can take many different shapes,, geometrical styles can also be developed with the use of some technical tools (Bayraktar, 2012). Abstraction is the method of "lowering the content of an idea or, in

other words, the technique of simplifying it." according to the core of this idea, (çeken & çelik, 2016) according to this principle, the objects in a piece of art aren't shown as they actually are, but rather are depicted in a different way after not distorting. (shafiq, 2014)

#### Islamic Abstraction

Abstraction in Islamic art is the basis on which this artistic heritage is constructed, that Islam opposes

the assembly of artworks that depict figures of animals or mortals. per Islam, all living creatures with the power of locomotion fall within the domain of God and may not be replicated in any form like art (Akkach, 2005). Hence Islamic art is thus distinguished from the other humanities by its rejection of managing the spatial image and traditional pictorial simulation, as used in some Western religious and non-religious arts, which represent the visual reality through the tools and vocabulary scientific and physical belonging to the truth and associated with sensible treatments for space, perspective, and material and the way of adaptation and formation. (Aldraish & Abed Al

Hadi, 2009) Islamic architects based their artistic inventiveness on using abstract forms to express their inner ideas, which resulted in great works of art. The Muslim artist's grasp of Islam's attitude toward simulation and image, as well as his philosophical, spiritual, and aesthetic attitude toward nature and its constituent parts, are both essential to comprehending Islamic art's abstract aesthetic philosophy. The specificity of abstraction lies in Islamic art as an art that takes the understanding of religion to man and the world and translates this understanding into aesthetic philosophy. (Behnam & Atefeh, 2013).

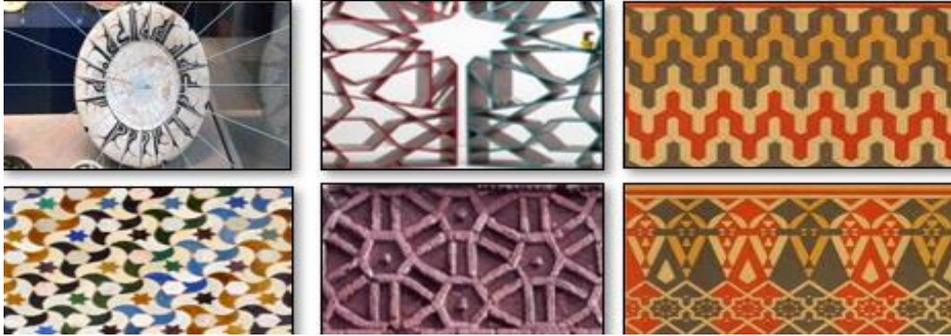


Fig.(2 ) Islamic abstraction

### Geometric Abstraction

Two types of geometric abstraction exist. In the first, the person who is expected to form a piece is requested to make a geometric reproduction. This way is a pleasant beginning for the person because it deforms their work and disfigureys them. Instead of creating something entirely new, the person will be closer to geometric abstraction if they update an old work of art with their own

emotions and expressions.( 2012 Barakat ) Additionally, Geometric Abstraction is the process of transforming existing forms into geometric shapes or altering their shapes in order to create new forms whose ratios are almost universal in nature. The forms are completely shattered when it comes to abstraction, as well changes in actual geometric proportions (Ali, 2013).



Fig.( 3 ) Geometric abstraction

### Islamic architecture

Islamic construction Islamic architecture can refer to a range of architectural styles that represent the core principles of Islamic 'aqidah. architectural Islamic arts, which just emerged a century after the prophet's immigration, have absorbed the tributaries of these civilizations. And Muslim Arab s are suffering from the aesthetic qualities of these ancient civilizations' humanities. (Itewi, 2007) Islamic architecture represents the real-life identity of Muslims in terms of their culture and civilization. a miniature of Muslim knowledge and development in terms of culture and civilization.

Islamic architecture has seen substantial evolution since the appearance of the core basic architectural features, especially with the expansion of the Islamic countries. and many countries with sophisticated and ancient civilizations joined them under the banner of Islam. This resulted in the uploading of new information, elements, and vocabularies into Islamic architecture, which helped raise the standards of aesthetic, artistic, and historical aspects in Islamic countries' architecture. (2003, Abdelmonem & Selim) A Muslim can experience this architectural identity and unity wherever he goes since Islamic architecture is unity

in diversity, which allows styles, materials, and motifs to change slightly from one realm or chronological period to another. Because of this, Muslim artists paid attention to the architecture and decorated it with numerous architectural, geometrical, and ornamental details, giving it a beautiful appearance that is in keeping with the significance of the function that this architecture serves. (Bloom, Bloom, & Blair 2003). There is no doubt that Islamic architecture exhibits a stimulating consistency in both content and appearance, regardless of when and where it was conceived and produced. Additionally, the essential feature of Islamic architecture is that decoration plays a significant role, with the style being characterized by ordered repetition, radiating structures, and rhythmic, metric patterns (Blair & Bloom, 2003).

### The mosque.

a mosque, a place of worship for Muslims that resembles a church or synagogue in other religions and frequently has at least one minaret. The first mosques are believed to be inspired by The mosque of prophet Muhammad's in Medina. (Ayyad, 2017), after prophet Muhammad's time A specifically recognizable Islamic style of architecture emerged that incorporated building traditions with the addition of localized adaptations of the previous Sassanid and Byzantine models. (Ahmed, 2016) Mosques' interiors and exteriors are decorated with Qur'anic inscriptions, creating a strong connection between the place of worship and the sacred text. Never human and animal shapes are used in mosque decorating Since they are seen as potentially idolatrous, . Instead, mosques are decorated with geometric, floral, vegetative, and calligraphic patterns that allude to the promise of Paradise. (Corniche, 2011)

### Cornices and cornices

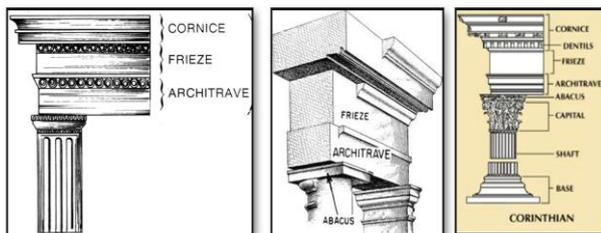


Fig. (4 ) Cornices and cornices

### The cornice

Building cornices play a key role in defining a building 's elements and are typically associated with a particular architectural design. Cornice a moulded horizontal protrusion that tops a wall at its highest point, when it joins a roof's sting. (Salland, 2015) The term "cornice" is also frequently used to refer to the ornate moulding above a door or window surround or to the topmost portion of an

entablature that rests on the frieze. Also, a cornice is a horizontally extending overhang that has numerous surfaces, planes, and profiles with limitless permutations. it is always present along a parapet or at the top of a particular plane .The cornice serves as a visible "cap" for the façade and aids in defining the structure as a whole. (Harris, 2006) One of the main characteristics that define the façade is the cornice. The sole type of adornment for a way, whether classical or modern in shape, is cornice moulding, which is utilized where the wall and ceiling meet. (Curl, 2003) When designing almost any style of architecture, cornices offer a number of significant aesthetic and practical advantages.(Thiel, 1980), . The cornice tops off or completes the portion to which it is attached. A variety of designs and component combinations are possible when using cornices to achieve various goals. (Kohane and Hill, 2015)



Fig. (5 ) Architectural Cornices

### Friezes

A frieze is a frame that encircles a picture or a pieced-together "construction" that relates to a perception, notion, or imagination. A frieze is a conspicuous band that is made of recurring floral or geometric designs that fits into the size of a building's wall. 2017 (Shehab). The friezes are typical of the mat that hangs on the walls of typical homes; they basically display stylised bundles of plant stems or reeds.. (Ćwiek, 2003) and are utilized in furniture design, ornamentation, and architectural design. Frieze moulding can be used to draw attention to a specific motif present in a floor covering or piece of clothing as well as to identify the purpose of a structure. Eaves can be used to emphasize proportions and suit the front of the structure in addition to their aesthetic function (Semper, 2011). The majority of the decorations on frieze feature floral or geometric shapes, although they can also be smooth or embossed. (Lu, 2016)



Fig. (6 ) Architectural friezes

## The Ornamentation

Ornament is derived from the word "ornate," which means "to brighten." It could refer to a decoration or an accessory, but it could also refer to an ornamental design. Another definition of ornament includes all types of geometric decorations and people of various shapes. ( Etikan, 2011) Ornament is also the most fundamental type of craft, including architecture. ( Riisber and Munch, 2015) Typically, ornament is a decoration of a specific shape or symbol to adorn something; or something painted, carved, and printed to feature values to a specific thing. (Mitrache, 2012) The ornament could also be a translator and a bridge connecting the building to the environment and people to history and culture (Clevenot, 2000). As a result, ornamentation serves as a tool for the local identity of the building, the environment, and thus the entire urban context within the context of sustainability. (Mitrache, 2012)

## Ornament Placement in Architecture

In architecture, ornament is classified as either exterior or interior. Exterior ornamentation is applied to a building's corners, center (symmetrical), bottom, roof ridge, crossing, or one side of the facade to emphasize a specific image of the building. Interior ornamentation is used to enhance the atmosphere and aesthetics of a room



Fig. (7) Ornament in Islamic architecture churches

## Research Methodology

This research is mainly based on Experimental and Analytical approaches, The Experimental work

The following are decorative geometric ribbons designed by the researcher, showing the possibility of using formation Islamic geometric in ornamentation of mosque, as an application of new elements in Islamic ornamentation, where he employed in ornamentation of Architectural elements of the mosque such as walls, cornice, Frieze, ceiling, façade.

## The innovative designs

All Innovative designs were prepared on Wave maker of textile where this program is powerful, professional design software that makes sense to designers, it was converted to 3D stereoscopic imprints using Rhino software designs were applying them to church façades using illustrator and 3D MAX programs on the facades of virtual

and is applied to the column, floor, enclosures such as walls, doors, windows, and the ceiling or plafond. (Brolin, 1982) According to art critics, ornamentation revolves around the essence of architecture rather than being an exterior cover. He believes that ornamentation reflects the inner greatness of applied science and is an important part of architectural building. He believes that the greatness of a building can't be shown through building perfection but through the type of ornamentation. (Mitrache, 2012)

## Ornament in Islamic architecture

Throughout history, Islamic ornamentation was the most distinguishing feature of Islamic architecture. It is used in mosques and other Islamic structures. Many studies have been conducted on the development of Islamic art from pre-existing traditional elements, as well as the character of the facility that wrought all of those various elements into a singular synthesis (Shafiq, 2014) There are two types of ornament: passive and active. Passive ornament serves only as decoration and has nothing to do with supporting a building's structure, whereas active ornament serves both as decoration and as a component of the building's structure. Aside from that, ornament can serve as both a pure decoration and a symbolic decoration. (Etikan, 2011)

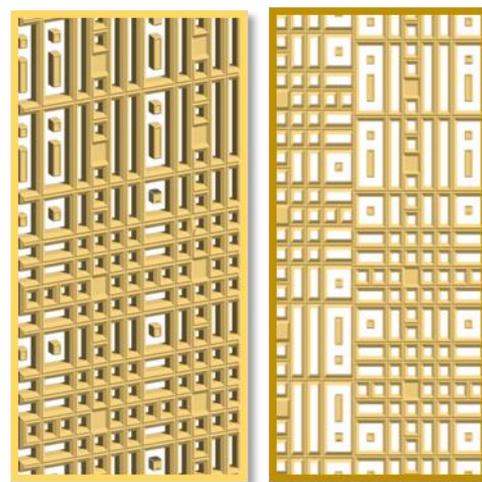
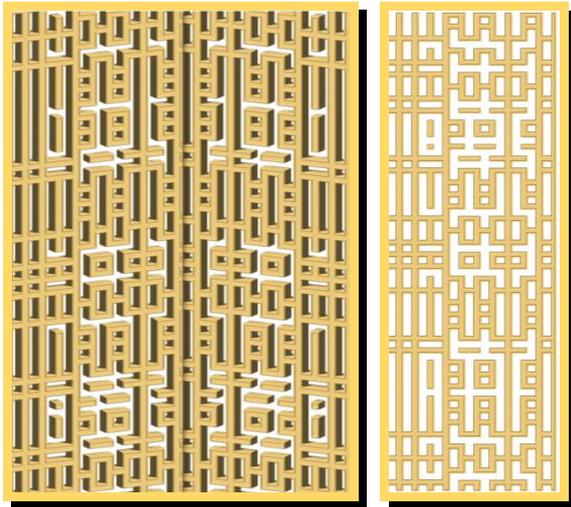
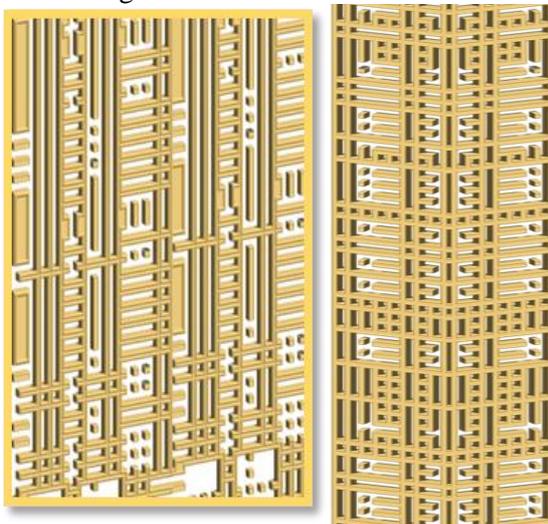


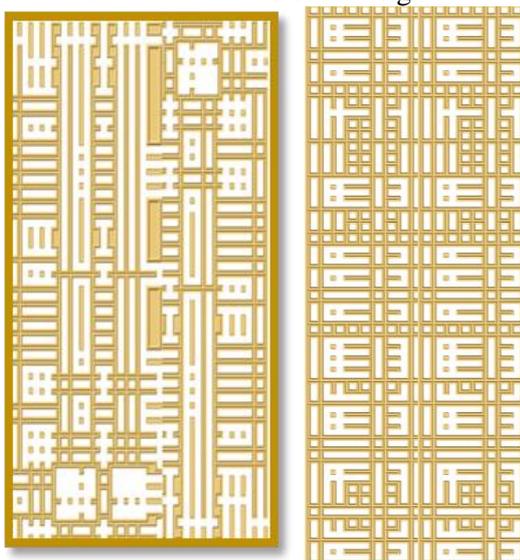
Fig. (8) illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design with two levels of surfaces



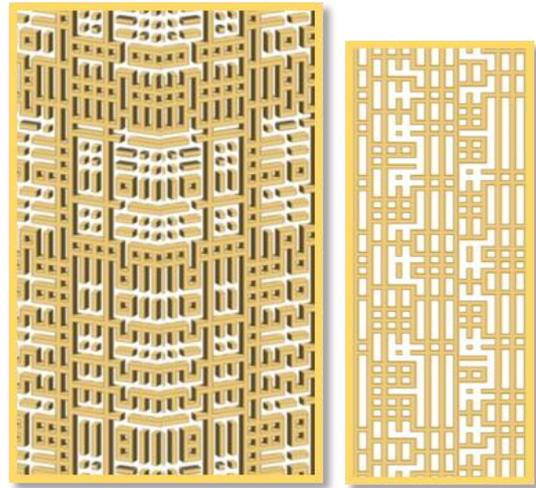
**Fig. (9)** illustrates s innovative design by using Islam and it was converted to a three-dimensional design with two levels of surfaces.



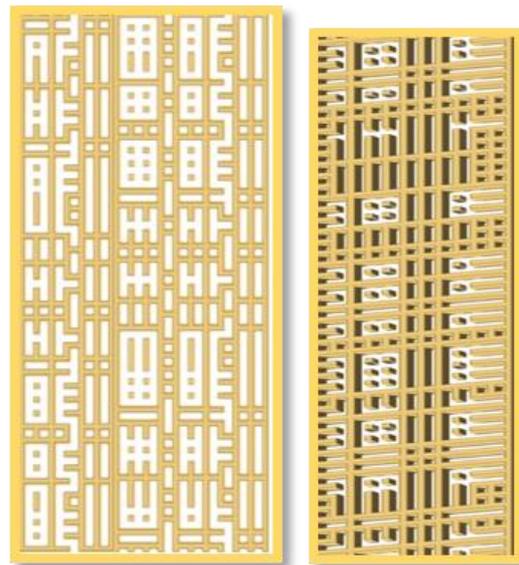
**Fig. (10)** illustrates s innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design



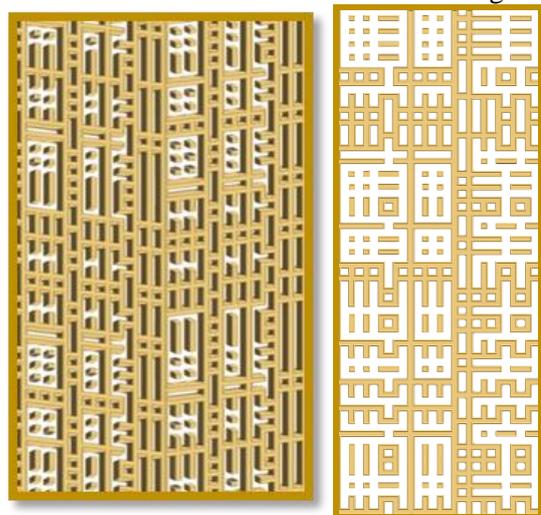
**Fig. (11)** illustrates s innovative design with two levels of surfaces. geometric abstraction



**Fig. (12)** illustrates s innovative design with two levels of surfaces. geometric abstraction.



**Fig. (13)** illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design



**Fig.(14)** illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design

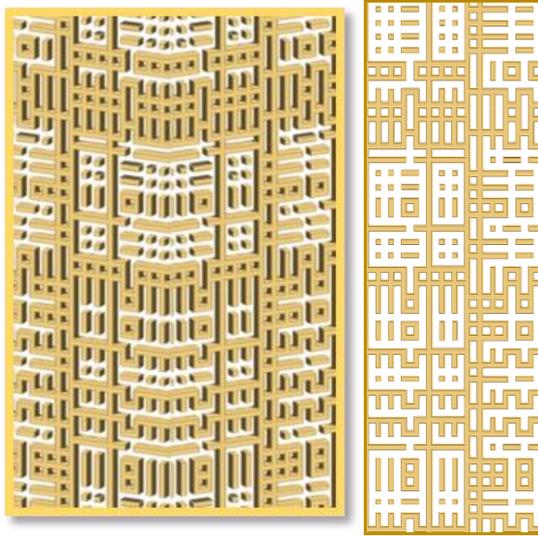


Fig. (15) illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design

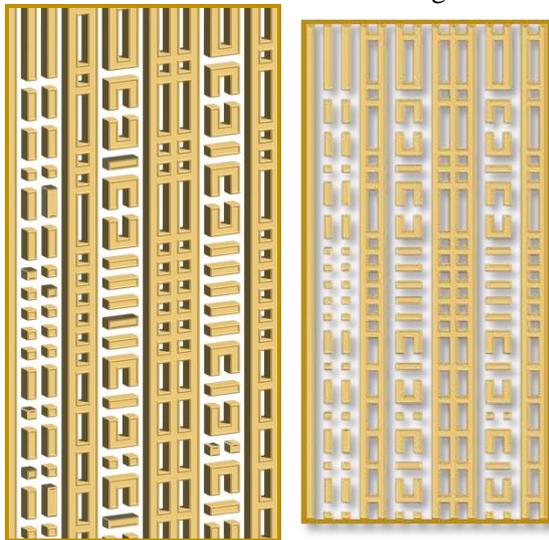


Fig. (16) illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional

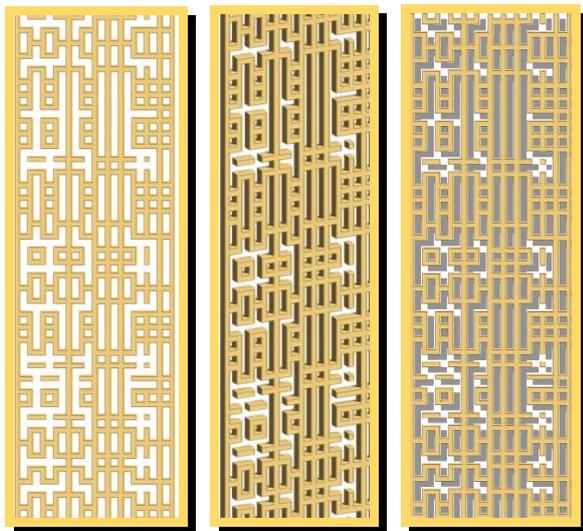


Fig. (17) illustrates innovative design by using Islamic geometric abstraction a design with two levels of surfaces.

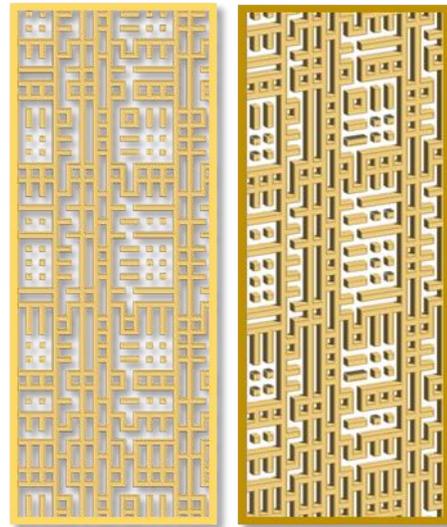


Fig. (18) illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design

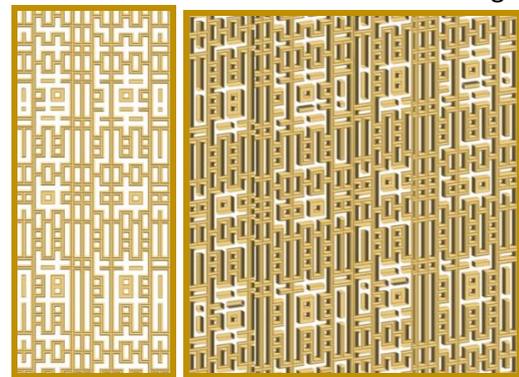


Fig. (19) illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design

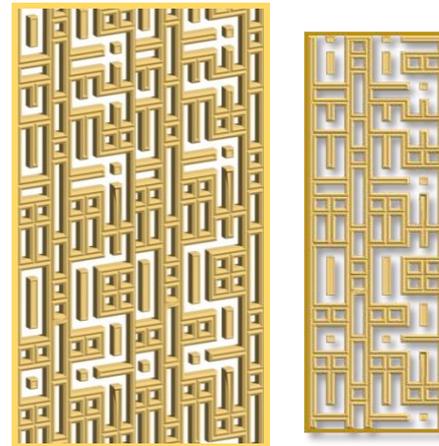
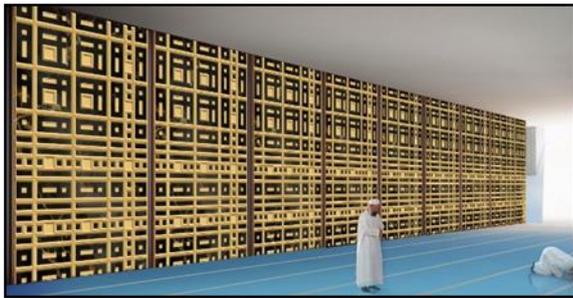
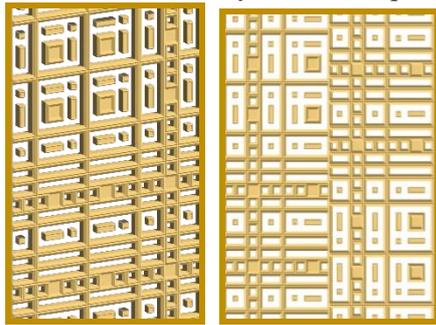


Fig. (20) illustrates innovative design by using Islamic geometric abstraction and it was converted to a three-dimensional design  
**Application Innovative designs on the facades of virtual churches**

#### Application the first innovative design

The design was done using Islamic geometric abstraction and it was converted to a three-dimensional design with two levels of surfaces. The design suitable for decoration the walls of

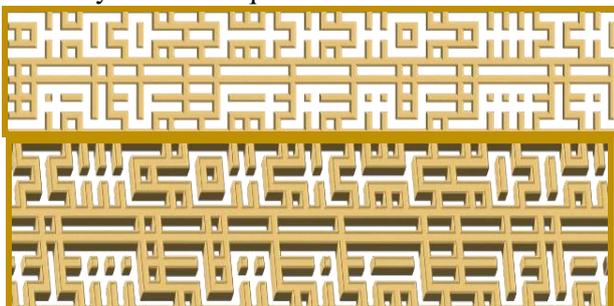
mosque. The geometric ornament appeared in the design confirm the identity of the mosque.



**Fig. (21)** application of innovative design by using Islamic geometric abstraction, on the walls of the virtual mosque.

#### Application the second innovative design

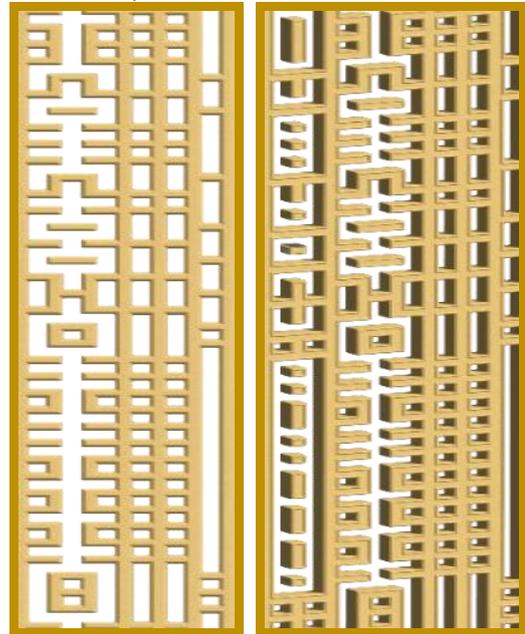
The design was done using Islamic geometric abstraction and it was converted to a three-dimensional design with two levels of surfaces. The geometric ornament appeared in the design instead of Quranic verses that may read wrongly beside of that these decorations confirm the identity of the mosque.



**Fig. (22)** application of innovative design by using Islamic geometric abstraction, on the walls of virtual

#### Application the third innovative design

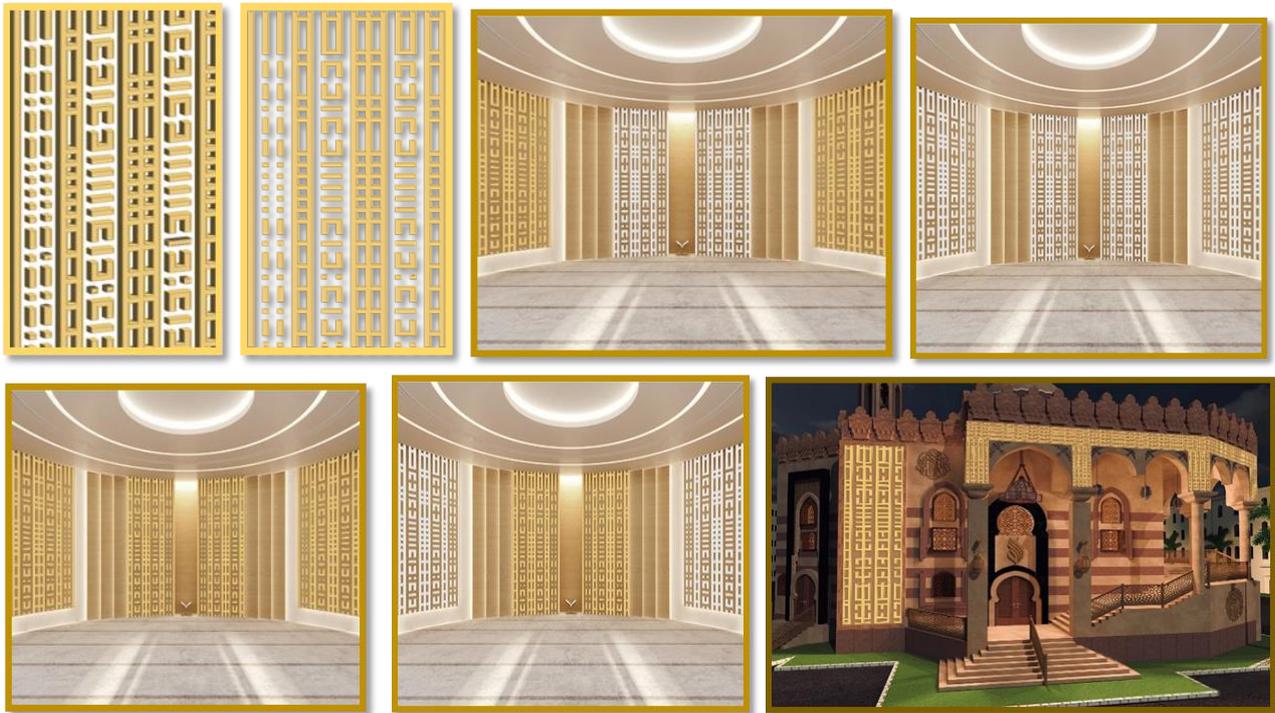
The design was done using Islamic geometric abstraction and it was converted to a three-dimensional design with two levels of surfaces. The geometric ornament appeared in the design instead of Quranic verses that may read wrongly. this design suitable for cornices inside and outside the mosque.



**Fig. (23)** application of innovative design by using Islamic geometric abstraction, on the cornices of virtual mosque.

#### Application the fourth innovative design

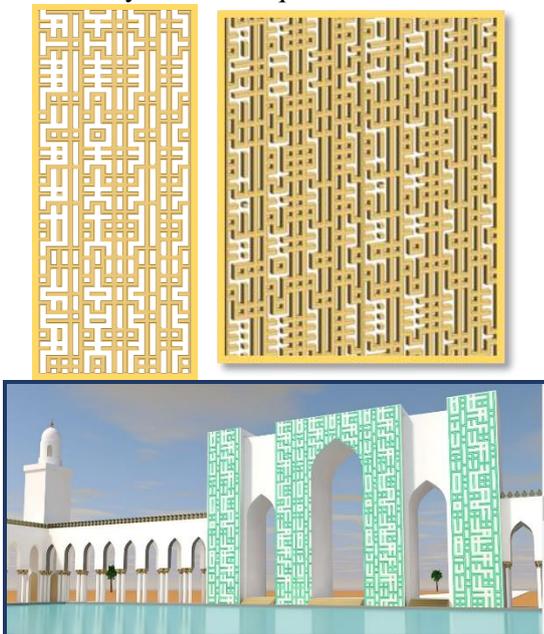
The design was done using Islamic geometric abstraction. this design suitable for decoration of mosques inside and out.



**Fig. (24)** application of innovative design by using Islamic geometric abstraction, on the facades of virtual mosque.

**Application the fifth innovative design**

The design was done using Islamic geometric abstraction and it was converted to a three-dimensional design. It is geometric lines symbolizing Islamic abstraction and confirming the identity of the mosque.

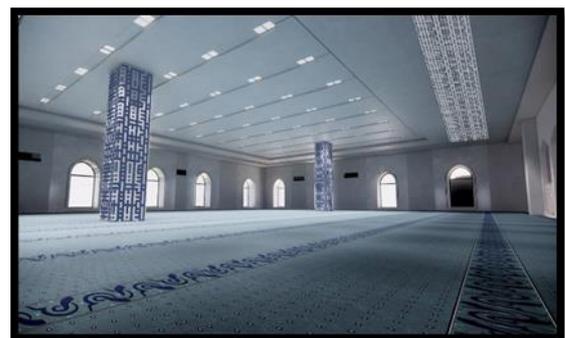
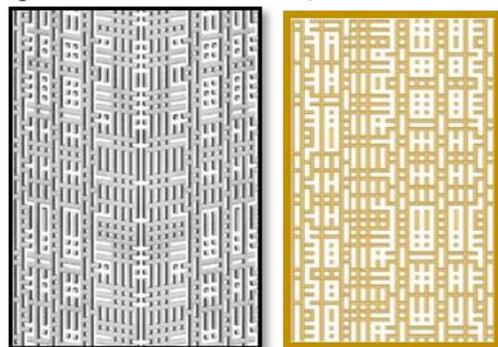


**Fig. (25)** application of innovative design by using Islamic geometric abstraction, on the facades of virtual mosque.

**Application the sixth innovative design**

It is geometric design indicating Islamic abstraction art. Design was employed on the columns and ceilings of mosques because the geometric lines confirming the identity of the

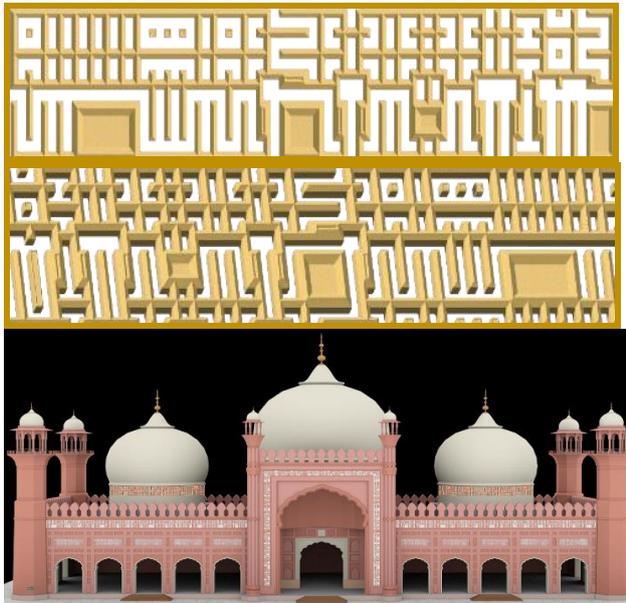
mosque as an Islamic building



**Fig. (26)** application of innovative design by using Islamic geometric abstraction, on the columns and ceiling of virtual mosque

**Application the seventh innovative design**

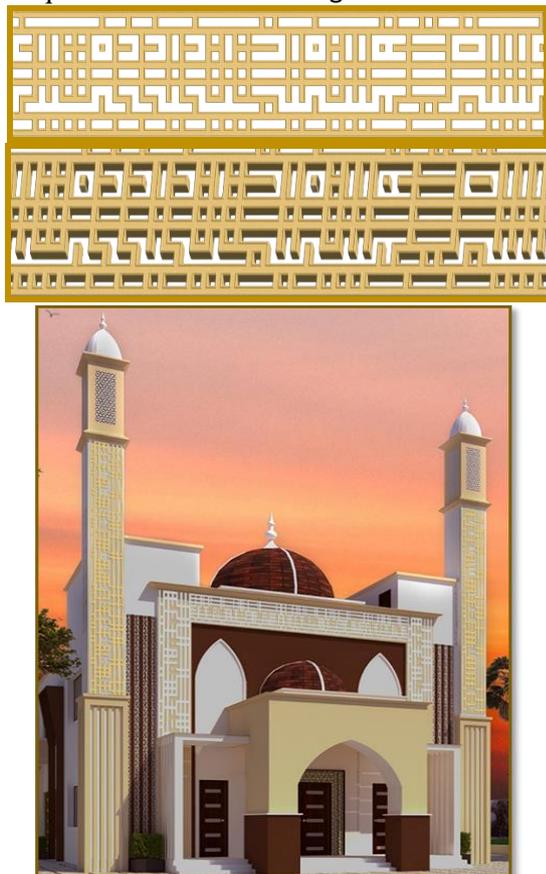
The design was done using Islamic geometric abstraction and it was converted to a three-dimensional design. The geometric ornament confirm the identity of the mosque, which using in cornices, a frieze and façade of virtual mosque.



**Fig. (27)** application of innovative design by using Islamic geometric abstraction, on the external dome and façade of the virtual mosque

#### Application the eighth innovative design

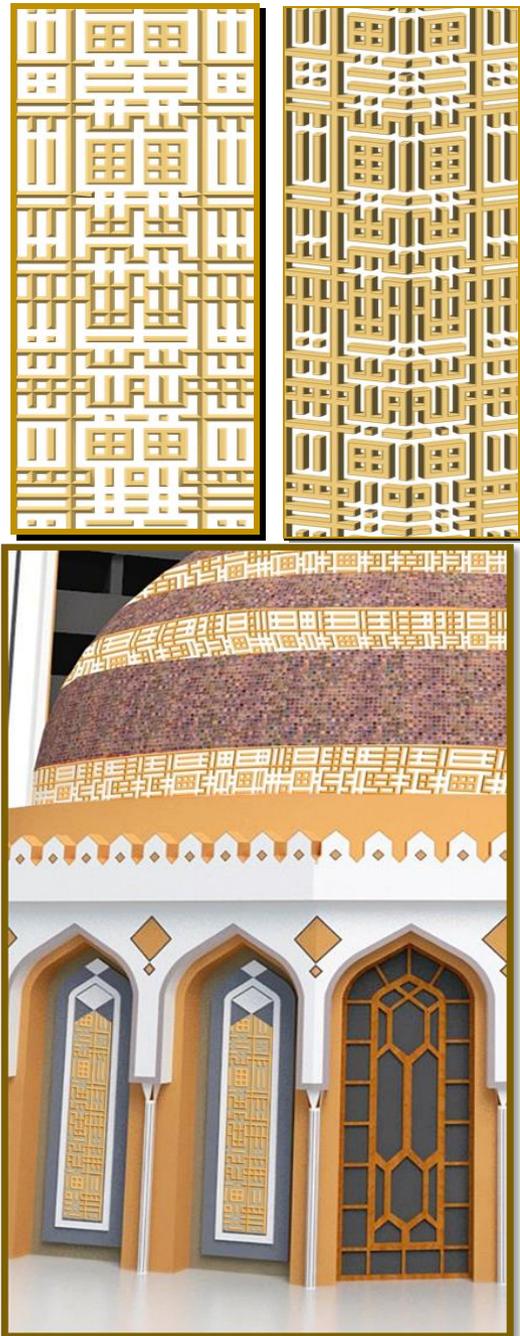
It is geometric design indicating Islamic abstraction art. Design was employed on the columns and ceilings of mosques because the geometric lines confirming the identity of the mosque as an Islamic building



**Fig. (28)** application of innovative design by using Islamic geometric abstraction, on facades of virtual mosque

#### Application the ninth innovative design

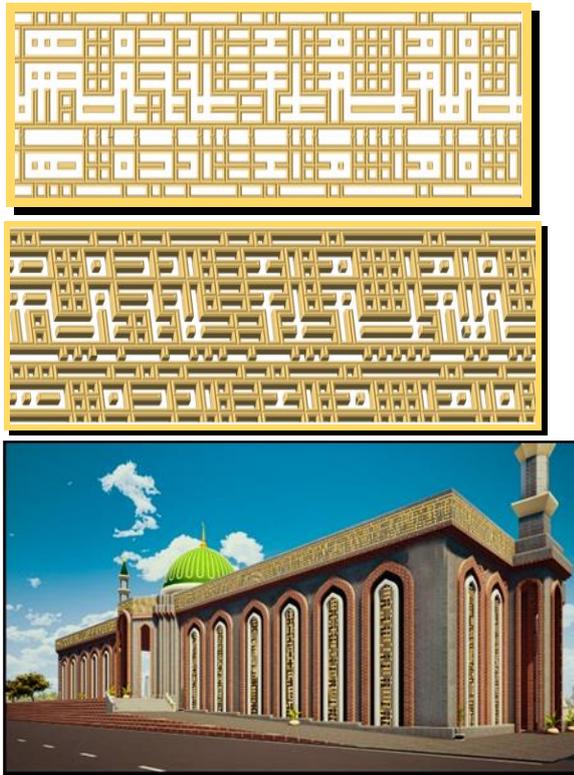
The design was done using Islamic geometric abstraction. It is design suitable for ornament of the Islamic building, hence it was employed on the windows and the external dome of the virtual mosque.



**Fig. (29)** application of innovative design by using Islamic geometric abstraction, on windows and the external dome of the virtual mosque.

#### Application the tenth innovative design

the design using geometric lines, so it suitable for ornament of the mosques and Islamic building, which it was employed on the facades, the windows, friezes of virtual mosque, The geometric ornament confirm the identity of the mosque,



**Fig. (30)** application of innovative design, on the windows and friezes of the virtual mosque

### Results

- Geometric shapes are adaptable, as Islamic artists demonstrated by using geometric lines to create sophisticated ornament architectural designs.
- Islamic arts contain a plethora of symbols and patterns that can be used as architectural ornament.
- 3.more researches are required to fully comprehend the geometric structure of Islamic patterns.
- 4. Islamic ornamentation is not a fixed heritage art form comprised of fixed elements and forms, It is a living art form that can introduce new elements based on the changing effects as indicated by human vision in through the years.
- All decorative elements support the principles of infinity, abstraction, symmetry, repetition, and bordering, Despite differences in materials, production techniques, and so on, these principles established ornamental unity in all areas of Islamic art decoration.
- Regardless of technological advancement, ornamented claddings are still regarded as the bridge and translator that connect the building to the habitat; thus, ornamented claddings are one of the tools of the local identity of the building that reflected their religious beliefs and native culture.
- Technology has resulted in a dramatic change in the shape of ornamentation, making it

possible to appreciate innovative designs that did not previously exist.

- Expanding research projects specializing in the aesthetics of Islamic arts and sustainable Islamic architecture in relation with now a day's concepts through various visions of research and studies
- Islamic geometric patterns have simple strict rules for creation and have an infinite number of possible patterns, the identical techniques of patterns creation are observed in every different place of applying.
- The study reached a proposal for a group of innovative designs within the field of designing for decorative of mosque and Islamic buildings by making use of the principles of abstraction in Islamic art.
- The abstract decorative vocabulary of Islamic art represented building units of a common style, allowing the use of those units in the formulation of artistic works, as well as the possibility of employing those standard decorative vocabulary in contemporary ornament architectural design works.

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