

## METHODS OF FORMAL RENOVATION OF MOSQUE ARCHITECTURE

**AHMED ALI AL-DABAGH**

University of Mosul, Mosul, Iraq. Email: Ahmadabdulwahid@uomosul.edu.iq

**Dr. AHMED ABDULWAHID THANNON**

University of Mosul, Mosul, Iraq. Email: ahmed.20enp145@student.uomosul.edu.iq

### **Abstract**

The conditions of Islam for the construction of mosques are purity and receiving the Qiblah, and for this reason mosques came accompanying the renovation and include old mosques or contemporary mosques and depend on the thought and culture of the designer in addition to economic, technological and other factors. Clear to study the subject, and to find a knowledge gap represented by the lack of clarity of knowledge related to the methods of formal renewal in the architecture of mosques, so the research problem was "the lack of sufficient knowledge of the methods of formal renewal of the architecture of ancient and contemporary mosques that architects followed in the renovation processes within the architecture of ancient and contemporary mosques, with no specification Detailed vocabulary for studying the subject. The main objective of this study is to reveal these methods of renewal within the architecture of ancient and contemporary mosques and to identify this vocabulary. Quantitative methods of renovation between ancient and contemporary mosques.

**Keywords:** Methods, Formal, Renovation, Mosque architecture

### **Introduction**

Talking about Islamic architecture in general and mosque architecture in particular is related to heritage forms and ancient construction techniques, but by tracing and analyzing the beginnings of the emergence of distinguished architectural models in Islamic architecture, we find that what distinguished these models is the ideas of modernity and renewal presented by these models in their time, and there are many examples in this field For example, the minaret of the Malawi minaret of the Great Samarra Mosque was a qualitative leap in innovation in the field of construction of minarets in terms of shape, constructional techniques and volume of work compared to what preceded it. In the development of contemporary mosque architecture. In the beginning, the concept of formal renewal in architecture and mosque architecture will be clarified and a procedural definition will be given to it. After that, a group of previous studies will be discussed in the light of this definition, which dealt with formal renewal, whether directly or indirectly, for mosque architecture through the method of analysis and fragmentation to reach knowledge and identification of the knowledge gap. And then formulate the research problem that this study will try to address, and then determine the research methodology to be followed in solving its problem and achieving its goals.

### **1. Definition of Renewal linguistically and idiomatically:**

Renewal in the Arabic language comes from the verb "renewed", meaning it became new, renewed it, meaning it made it new, and so do I find it and seek it, and everything that the

days did not come to is called new. [Lisan al-Arab Article (new): 2/202 [Saeed, 2009, p. 4]

Renewal, idiomatically, is to come up with something that is not common or familiar, and it is either by creating methods or topics that deviate from the usual style, or reconsidering topics and methods and introducing amendments to them so that they appear innovative. [The Literary Lexicon, Jabour Abdel Nour: 5] [Al-Kinani, 2017, p. 590]

If we move to the field of poetry, we find that the term renewal comes through the use of new vocabulary in poetry that was circulating among people, which was unknown in previous ages. [Al-Kinani, 2017]. In the field of prose, there is reference to renewal in Andalusian prose as an example of renewal whose words were characterized by ease, clarity, and the tendency to adopt imagination. [Al-Jubouri, 2015]. In the field of art (painting), innovation appeared by distinguishing the formation of shapes with fertile imagination, openness of horizon and interpretation, and this renewal was not disconnected from the heritage, as it had a major and active role in the birth of contemporary Arab art. [Al-Saadi and Al-Balooshi, 2018]

As for the renewal in architecture, it was not isolated from the renewal in other arts. We note that the architectural development in any era was not a spontaneous or involuntary development, but rather it was a gradual development that took place with a prior arrangement. Ages and linked societies and civilizations. [Fathi, 20013]

### **3. Renovation in Mosque Architecture:**

Islam did not impose special conditions or a specific design for the construction of mosques, as much as it set general controls that define their essential identity, the most important of which is purity and the direction of the Qiblah. It differs from it in the far reaches of Morocco and so on. [Ibrahim, 2018].

It can be said that renovation in mosques means a process of modifying the shape of the mosque at the level of the whole or the constituent elements of the mosque without changing the functions and in a way that does not conflict with the concepts of Islamic law and for cultural, environmental and technological reasons. This concept arises as a result of psychological motives and mechanisms of thinking.

And mental orientation, in addition to the requirements, needs and circumstances of the external environment.

And by applying all of the above, we can say that the formal renewal in mosque architecture is a design act that aims to produce an architectural product, whether at the level of the whole or the part, that is not common or familiar to what preceded it in mosque architecture in terms of style or subject matter, or reconsidering the design or architectural style and introducing Amendments to it so that it appears in an innovative way and results in a product of mosques that is not cut off from the heritage.

#### **4. A review of previous studies:**

This paragraph includes reference to a group of previous studies that dealt with the subject of formal renewal in mosque architecture to identify the knowledge gap and reach the research problem, and complete the following:

##### **4.1 An intellectual study, 1965, (Cairo mosques and schools):**

This study dealt with the renovation implicitly, and specialized in studying the mosques of Cairo in Egypt, as well as studying the renovation at the level of the elements, as it dealt with the domes in terms of the form and the shape in which they appeared.

With its multiplicity in the single mosque, in addition to its description of the decorative styles used during that period and their development, it also dealt with renovation using new structural systems, the use of graceful columns instead of retaining walls, the use of stone, and the cladding of facades with other materials.

##### **4.2 Hussain Munis, 1981, (The Mosques):**

The book dealt with mosques, their importance and their role in the Islamic society, and dealt with the renovation implicitly, then dealt with the mosques according to specific models and distinguished each model through a set of methods of renovation that appeared for each model, whether it was at the level of the internal elements that were dealt with briefly or at the level of the external elements such as the contracts and method Its construction and the building materials used, as well as domes and minarets, as well as dealing with the tacit renovation at the level of planning, and the method of dealing with mosques was within an open and indefinite period.

##### **4.3 Study:**

Filiz Karakus, 2021, (Urbanism and mosque architecture in the Ilkhanid period):-

The study dealt with the formal renewal of mosque architecture during the Ilkhanid period in Iran, with

Focusing on dealing with renovation at the level of the mosque as a whole, through a change in the proportions of the mosque, whether at the level of external elements or internal elements, such as prayer halls, in which the height has become greater than the width of the hall. The study showed that the Mongolian culture had a clear impact on mosques during this period, and it mentioned renovation through the use of new building materials and the use of new decorating methods. [karakus, 2021, p. 166]

##### **4.4 Ehsan dizany study, 2017, (Finding the patterns of Indian mosques architecture):**

This study dealt with renovation indirectly and showed that the architectural features in the basic mosques in India are a mixture of Indian temples and early Islamic mosque styles in the sense that there is an influential role for local culture in the formal renewal of mosques, as Indian mosques achieve a new and mixed model in the architecture of the Islamic world with The use of stone materials which is a defining feature of Indian mosque architecture.

#### **4.5 Study by Sherif Mahmoud and Abu bakr al-sakkaf, 2021(Modern trends in mosques architecture):**

The study dealt with the renovation through three axes: it is the shape of the mosque block, and the renovation that took place in it in terms of building materials, as well as focused on mosques that included a new method in dealing with natural lighting in contemporary mosques, through the use of glass clearly, relying on technological development and the last axis It is the renovation at the level of the interior design of the prayer hall, and the renovation that the study dealt with was at the level of the external and internal elements of the mosque such as the ceiling and domes. This research also analyzed examples of contemporary mosques and compared them with their counterparts in the same period [Mahmoud & al sakkaf, 2021, p.1]

#### **4.6 Meltem özçaki study, 2018, (Interpreting the mosque architecture):-**

Implicitly dealt with renewal in contemporary mosques, as the study showed that a set of methods were used in the design of contemporary mosques, such as focusing on the symbolic and philosophical meanings and methods of the mosque, as well as the role and influence of local culture in giving the mosque its own identity.

As well as renewal with the emergence of new building techniques and building materials, it was also mentioned that the renovation processes appeared at the level of external elements and internal elements. The study stated that the difference in the bodies of mosques was due to the different geographical regions, climate, cultural structure, local characteristics, and traditional materials. [özçaki, 2018, p. 436]

#### **4.7 A study by Reham Ibrahim and Zainab Faisal, 2009, (Contemporary Islamic architecture between renewal and imitation):**

The study implicitly dealt with renewal, and mentioned a renewal method that is the introduction of local elements in contemporary mosques with what is known as the stuttering method, which is intended to collect old local elements with cultural significance and make changes to it in accordance with the language of the era. [Ibrahim & Faisal, 2009, p. 8] The method tries to formulate and create a new architectural language that is free from proportions and scale and employs its vocabulary in a contemporary way that expresses the present and selects the most important heritage symbols that confirm the visual character of the mosque. ]

#### **4.8 Study of Asmaa Al-Muqram and Zainab Hussein Raouf, 2019, (The Dynamics of Contemporary Mosque Architecture):-**

This study focused on the shape of the mosque as a whole and did not focus on a specific element. It talked about formal strength and how to give it to the mosque, and the possibility of adopting simplicity in giving formal strength. The study talks about the philosophy of formal renewal and refers to models of mosques that support the goal of the study. The study also lacked comparisons between mosques. Ancient and contemporary mosques to clarify the sequence of the renovation process, and it did not

specify vocabulary that could be dealt with in the study and did not specify possible values for it in terms of levels of renewal and reasons for renewal.

#### **4. Discussing previous studies and extracting the research problem:**

By reviewing previous studies, we note that these studies dealt with the formal renewal of mosques at the level of specific elements only for the mosque such as minarets, domes and other elements, and some of these studies dealt with renewal as an evolutionary concept of the element during historical periods, and some of these studies did not detail specific vocabulary in a way detailed with their possible values. Likewise, most of these studies did not rely on comparisons between ancient mosques and contemporary mosques in a quantitative manner, but were satisfied with

By analyzing specific models and for specific geographical areas and did not give statistical percentages of renewal, all of this formed a knowledge gap related to the vocabulary of the formal renewal process in the architecture of ancient and contemporary mosques, which led us to the research problem, which was represented by "lack of knowledge related to the formal renewal of the architecture of ancient and contemporary mosques and the failure to sort specific vocabulary with its possible values for the study of the subject".

#### **5. Research Methodology:**

In order to solve the research problem and achieve its objectives, a research methodology was developed that includes the following points:

6.1 Building a theoretical framework that extracts the basic vocabulary for studying the subject of formal renewal with its possible values, using the help of previous studies that dealt with mosque architecture through the method of analysis and fragmentation.

6.2 Putting the results of the theoretical framework in the form of a form or a table that includes the most important methods of formal renewal with levels of achievement within the architecture of ancient and contemporary mosques.

#### **6.3 Draw final conclusions and recommendations**

##### **6.1 Theoretical framework Methods of formal renewal in mosques:**

Previous studies that dealt with formal renewal, implicitly or directly, produced a group of methods that formed the building blocks of renewal for ancient and contemporary mosques, and among these methods:

##### **6.1.1 Renewal by adding new components and functional elements:**

This method appeared in Egypt during the Mamluk period by introducing new functional components and elements to the original building to include the mosque: a school, a hospital, a path, and its spaces are expanded and its parts and accessories are many, as in the renovation that took place within the Sultan Qalawun Mosque (Fig. 1-A) [Munis, 1981, p. 86 ] [Saeed et al., 2018, p. 712] ] Also, the process of introducing gardens as

new elements in the composition of mosques, as in the Shah Mosque in Isfahan, in addition to the use of the central plan system, which consists of four iwans added to the composition (Fig. 1-b) [Mo'nis , 1981, p. 85, 87] It is also referred to the addition of a mastaba that works to raise the floor of the mosque in general from street level, as in Malaysian mosques and Indian mosques, as well as what is known as (the dome of the foyer) appeared (Fig. 1-c), which appeared due to the increase in worshipers And the expansion of the mosque. [Fikri, 1965, p. 142]

In contemporary mosques, other religious extensions have been added to contemporary mosque architecture, such as a mosque

Ali Pasha for the year (2007) (dogramacizade ali pasa mosque) in Turkey, which was established as a religious complex that includes a mosque, which is dominant over the complex, and a church for Christians and a synagogue for Jews were added [Al-Naim, 2022, h. 18, 23], as well as a mosque of Mashhour Yusuf (Fig. 1-d) Which includes a group of activities and spaces added to the prayer hall that was signed on the first floor [Al-Naim, 2022, vol. 26].

### **6.1.2 Renewal through a change in the general form or one of its elements:**

This method appeared in the old mosques through a change in the shape of the elements, as in the minaret of the Great Samarra Mosque with a spiral shape, whose shape witnessed a change from the minarets that preceded it (Fig. The minaret tower by adding an additional head, such as the minaret of al-Ghuri, which is one of the five minarets of the Al-Azhar Mosque in Egypt (Fig. 2-b) [bashier, 2013, p. 35] in Iran, and during the Ilkhanian period, emphasis was placed on increasing the vertical direction of the mosque by increasing the height ratios of the gates, for example, so high gates appeared For mosques, spaces that are longer than wide were used with more pointed arches to achieve greater heights, as in the Urmiya Mosque (Fig. 2-c) [karakus, 2021, p. 170].

In contemporary mosques, mosques with general forms far from the familiar shape of the mosque appeared, such as the Bait al-Salam mosque in Indonesia (Fig. 2-d), which appears as an administrative building and is difficult to distinguish as a mosque from the outside as a result of the formal change that was made to the general shape of the mosque [Al-Naeem, 2022, h. 18] Likewise, the mental image of the mosque was changed by changing the shape of the elements such as the minaret and the domes, which are the two inseparable elements in shaping the image of the mosque, as in the Australian Islamic Center (Fig. The wall to be distinguished as a minaret [Al-Na'im, 2022, H. 1] Some elements were also borrowed from ancient mosques, but this metaphor was not always literal, but rather its proportions were manipulated, as in the Al-Warqa Mosque in the Emirates (Fig. 2-f), which witnessed the borrowing of contracts with the change in their dimensions And its proportionality led to the emergence of a new form of contracts, which were employed for symbolic aesthetic needs [Al-Naim, 2022, p. 11]



### 6.1.3 Regeneration through a change in the motor axes:

The early mosques, including the Prophet's Mosque, were distinguished by the signature of their main entrances in the middle of the wall opposite the mihrab, to have a strong kinetic and visual axiality leading to the courtyard, including the transition

To the prayer hall, which includes a main entrance facing the wall of the Qiblah, and the mosques that followed came in the same style. In addition to that, attention was paid to the entrances in terms of their location. In some cases, they were placed within a recessed frame in the wall and topped by a minaret (Fig. 3-a) [bashier, 2013, p. 5 ], It was also distinguished by the multiplicity of these entrances, and the presence of an entrance in the qibla wall, such as the Ahmed Ibn Tulun Mosque in Cairo, dedicated to the ruler and his entourage.

And the renewal of the axes of the mosque did not include the axes of horizontal movement only, but also included the axes of vertical movement. It is known that the movement of ascent inside the minaret was carried out through stairs inside the body of the minaret, as in the Umayyad Mosque. Through a spiral staircase that wraps around the minaret from the outside (Fig. 3-B) [Yaghi, 2009, p. 116] Contemporary mosques have also relied on a new type of movement inside mosques in which the axiality of movement is broken and the position of the prayer hall within the mosque is focused with the focus of the direction of the hall Towards the Qiblah, as in the mosque of the Aman district in Bangladesh (Fig. 3-c), as the movement in it is circular around the central hall. Entrance to the hall is from several entrances located on three sides of the hall, while the fourth side includes the qibla wall [Al-Naim, 2021, H. 3] as well. That put a prayer hall in

The first floor led to a change in the movement of ascent, either by side stairs or by ramps, as in the Bait al-Salam mosque in Indonesia (Fig. 3-d) [Al-Naeem, 2022, H10, 12, 13]

### 4.1.6 Innovation through finding new environmental solutions:

The old mosques relied on the compact fabric of the city, not separating the mosque from its neighboring buildings, and using local building materials such as bricks, plaster, etc., which maintain the temperature inside the mosque, as well as the use of internal courtyards [Al-Khalifa, 2017, p. 343] [dizany, 2017, p. 76 ] In the mosques of Andalusia, the area of the courtyard was reduced, and the Andalusians planted trees in the courtyards of their mosques for their beauty and seeking shade and to protect the worshipers from the summer heat, as in the Mosque of Cordoba (Fig. pp. 436, 442]

In contemporary mosques, the architect sought to make the building suitable for the environment and not to copy and replicate mosques in different regions, and this led to the emergence of different mosques with their ideas and compatible with the environment in which they arose, so the concept of sustainability was achieved in the Cologne Mosque (Figure 4-b) in Germany, where the environment had an impact on The design of the mosque through the mass of the building, which is in harmony with the surrounding environment openness to the outside

And its transparency [Al-Saadani, 2019, p. 124], and solar energy was used as a renewable source of energy through photovoltaic cells in the building's external openings and benefiting from an integrated system for water recycling by reusing gray water in works other than drinking, such as irrigation and cleaning [Al-Saadani, 2019, p. 124 ] As well as in the Cyberjaya Mosque (Figure 4-c) by applying the idea of environmentally friendly construction by using rainwater to irrigate the crops and using the energy conservation system (VRF) and using glass panels that reduce heat leakage in addition to adopting solar roof panels and adopting natural ventilation for the mosque [Al-Muqram & Al-Obaidi 2017, p. 17]

### **5.1.6 Renewal by creating a new relationship between the components of the mosque:**

The old mosques appeared with traditional relationships linking the components of the mosque with each other, but this was followed by mosques in which new relationships between the elements appeared, for example the Great Samarra Mosque (Fig. ] Likewise, in contemporary mosques, we note that the square prayer hall has become dominant, as in the Cyberjaya Mosque in Malaysia, which includes a minaret with a side location outside the mosque [Al-Naim, 2022, H. 7] Contemporary mosques with strong formations and relationships that express

About the spirit of the times, such as the mosque of the Aman Economic Zone in Bangladesh (Fig. 3-C) (2020), as we notice in this mosque a new concept of the prayer hall that was signed in the middle of the mosque in the form of a cubic block and surrounded by the courtyard on all sides, meaning that the prayer hall took the central position After it had a side location, it was preceded by the courtyard surrounded by arcades and other spaces, and entry to it would be from three directions, which would be surrounded by a high hill supported by concrete walls [Al-Naim, 2021, Ch. 3]

### **6.1.6 Renewal through the introduction of local elements:**

The old mosques in Iraq witnessed a rejuvenating style represented by the introduction of the use of local elements that were prevalent in previous architectural periods within the same country and the introduction of their use again in the construction of mosques, so the high walls affected by the Assyrian and Babylonian temples were used, and the construction of huge towers and pillars, as in the Samarra Mosque, and the mosque plans also came with additions It is known as the increase surrounded by giant walls leading to the prayer hall similar to the voids found in the Assyrian and Babylonian temples, as in the Al-Mutawakkil Mosque [Dhanoun, 2018, p. 6]. 2018, p. 4].

Contemporary mosques were also influenced by the local culture, so the design of the mosque reflects the local cultural identity of the region in which the mosque is established, as in the Cyberjaya Mosque in Malaysia (Fig. These elements may not only be for structural or climatic reasons, but rather for symbolic reasons, giving an identity of belonging to the mosque and increasing the ability of the mosque to interact with local cultures without dissolving in them. The hierarchical roof and roof structure of the Faisal Grand Mosque are somewhat similar to the vaults of Gothic ribs, except that the Gothic



vault gives flexibility. And soft lines instead of hard sharp edges in the design of the Faisal Mosque (Fig. 6-a) [nasim, 2008, p. 10].

### **6.1.7 Renewal through conformity and formal dissolution with the site:**

The old university mosques represented the basic nucleus in the planning of new cities and were considered a center for urban life. The mosque in its direct context of the buildings and streets surrounding it, and thus the mosque was in its beginnings consistent and dissolved in its location [Al-Khalifa

2017, p. 55] For example, the shape of the plan of the Al-Aqmar Mosque (Fig. 7-A) was not regular from the outside, as it was subject to the requirements of urbanization, which adhered to the boundaries of the surrounding street, but from the inside, the shape of the plan of the mosque was regular and rectangular in shape, while the space between the rectangle and the external borders It was filled with halls placed at the back of the mosque in order to make the mosque consistent with its location from the front side (the street) [Fikri, 1965, pp. 142, 160].

As for contemporary mosques, it was the beginning of the mosque's separation from its urban surroundings during the initial era of mosques in Europe, in which mosques were separated from their traditional urban context, as they were considered exotic architecture and were built on the outskirts of cities for reasons related to Islamic rulings and building provisions specific to those cities that oblige the mosque to use certain styles. In construction, it differs from traditional Islamic architecture styles [Al-Omari et al., 2017, p. 66] [sojak & others, 2019, p. 183], which generated a contradiction between the mosque and its urban context. In the middle of the complex, there is a mosque that is in the direction of the Qiblah without affecting the neighborhood context [Al-Omari et al., 2017, p. 74] then contemporary mosques witnessed another solution that represented renewal

By linking the mosque with its natural and topographical location, as in the Sancaklar Mosque in Turkey (Fig. 7-b), it is noted that the terrain interferes in the formation of the mosque, so the mosque is built underground and has an unconventional shape, as the mosque was signed underground and included a lighthouse and a covered seating area with employment Natural materials such as rough rocks as finishing materials enhanced the natural character of the mosque in general [özçaki, 2018, p. 436] [Al-Muqrim & Rauf, 2019, p. 13]

### **8.1.6 Renovation through the introduction of new decorative methods:**

The first decorative style that was adopted in mosques in general was the style of abstraction according to religious directives that forbade depiction and embodiment in arts in general and architecture in particular. Decorations, whether geometric or botanical, may be mere drawings abstracted from their original shapes. They may be engraved or prominent, and they may be colored. One or more, and Muslim artists created forms resulting from the intersection of lines called the star plate, which are round-shaped decorations whose lines make a star in the middle. Tangles, broken lines, strands, zigzag or curved lines, etc.,

This formed the so-called Arabesque arts in the Islamic East, and another word emerged that parallels the term "arabesque", which is "Mauresque" to refer to the decorations of Islamic arts in the Islamic West to distinguish them from the decorations of the Islamic East. [Mo'nis, 1981, p. 133, 136]. Mosaic was also used to decorate the gates, as in the (veramin) mosque and (yazd) mosque (Fig. 8-a) [karakuş, 2021, p. 166] [Hillenbrand, 1994, p. 22] [Dhanun, 2018, p. 9]

As for the style of decoration in contemporary mosques, it was influenced by philosophical aspects and religious ideas, and the decoration in the structures of contemporary mosques was formed through the structural details of the materials used in the structures, and it was not separate from the structure. (Punchbowl) in Australia and (Hoşgörü) Mosque in Turkey (Fig. 8-B). Nowadays, the prevailing opinion in decorating has become that true beauty is not in decoration, but in essence and form. Artificial lighting has also been used inside mosques and on facades as a new decorative way to highlight the aesthetic of the mosque based on technology and advanced technologies [Özçaki, 2018, pg. 470, 471] as well as Relying on simplicity and abstraction in composition and moving away from the multiplicity of blocks such as the Grand Mosque in the Dubai Financial Center [Al-Naeem, 2022, vol. 10] [taib & ahmed, 2016, p. 42]. A new concept also appeared in the design of mosques that was not the focus of the architect's attention previously, namely the symbolism of the mosque and the meanings and messages it reflects to the recipient, which has received great interest in contemporary mosques. In the Strasbourg mosque in France, a sky-colored dome (light blue) was placed in order to achieve the meanings of association with the blue sky dome, as well as in the structural structure of the mosque itself, which was influenced by the shape of the eight star, which includes crescents at the heads of this star (shown in red) [Al-Naim, 2022, h5](Fig. 8-c)

Among the concepts that emerged and were employed within contemporary mosques is the concept of coexistence between religions, through the establishment of a religious complex that includes a mosque in addition to a church for Christians and a synagogue, as in the Ali Pasha Mosque (2007) in Turkey [Al-Naim, 2022, h. 23] The idea was also inspired Hira Cave in the formal design process of the Sancaklar Mosque, and the shape of the Al-Irshad Mosque (Fig. 8-d) was inspired by the shape of the Kaaba, and the shape of the Faisal Mosque in Pakistan was inspired by the shape of the tent

And so [Al-Muqrim & Rauf, 2019, p. 13] [nasim, 2008, p. 10] [Özçaki, 2018, p. 436]. The same is the case in the White Flower Mosque (2015) in Tirana, which is considered an iconographic simulation of the white flower, which is considered a symbol of beauty and purity, and it is a symbol that is fully compatible with Islam (Fig. 8-e) [Al-Muqram & Al-Obaidi, p. ].

### **9.1.6 Renewal through the use of exaggeration and exaggeration:**

The style of exaggeration and exaggeration was very clear in the Great Mosque of Samarra, through the large area of the mosque, which reached an area of (27,000) square meters, in addition to the high walls and the construction of huge towers and pillars (Fig. 9-A) [Dhanoun, 2018, p. 6]. The Mosque of Al-Hakim, Al-Juyoushi, and Al-Aqmar in the form of two towers, in the middle of which is a corridor leading to the mosque (Fig. 9-

b) [Fikri, 1965, p. 143], as is the case with the high walls and huge gates covered with marble, alabaster, and colored faience of the Blue Mosque in Tabriz (Fig. 9-c) [Munis 85, 87] Entrance to the mosque was also achieved in Indian mosques through a huge staircase and high gates that fulfill the concept of the edifice and are inspired by the temples of fire [dizany, 2017, p. 81]

Huge and exaggeration in contemporary mosques were also used to achieve the edifice in the Sultan Qaboos Mosque (2001) through the huge gate and the large area that reached (40,000) square meters, as well as through the central dome, which reached a height of (50) meters, and in Mashour Yusef Mosque (2012). (Fig. 9-D) In Kazakhstan, the huge dome was used in a funnel-shaped star shape that ends in a hemisphere with four high minarets at the corners of the mosque, in addition to a huge gate to the mosque [Al-Naim, 2022, H. 18, 26].

#### **10.1.6 Renovation through the use of a structural system and new building materials:**

The early mosques were built with the local materials available at the time. The mosque was built with thick walls, as well as a forest of columns inside the prayer hall. After that, the building system was renewed using structural shoulders, as in the Great Samarra Mosque (Fig. 10-a), and with the development of building materials, we notice the beginning of a reduction in thickness Columns and wall thickness. At a time when burnt bricks were used in building minarets in East Asian countries [Wafi, p. 79] stone was used in building minarets of Egypt, Syria, Morocco, Andalusia and Asia Minor, and bricks and carved stone were used in Iraq, Iran and Central Asia, and faience was also used in cladding minarets [Yaghi] 2009, p. 112] In Turkey, the Ottoman minarets were covered with marble Al-Abyad and sandstones [Wafi, p. 81]. As for the method of building domes, a new method was found to move from the square shape to the circular shape in order to carry the dome over it, and there was a set of previous methods, including (the method of corner niches that are in the form of niches to convert the square base into an octagon on which the dome rests, as in Al-Azhar and Al-Hakim mosques, and the method of spherical triangles Which spread after the Ottoman conquest, and the method of the corner mihrabs) and a new method and style was added, which is (muqarnas), which is a mixture between the two styles [Waziri, p. 23]

### **7. Levels of emergence of innovation in mosque architecture:**

#### **7.1 Renovation at the level of the mosque as a whole:**

It means the case when the renovation is clear on the general shape of the mosque, for example in some mosques we notice that the shape of the general mosque has taken the vertical extension and in it the formal proportions of the mosque have been changed, such as the (urmiya) mosque compared to the Seljuk mosques [karakus, 2021, p. 168], or As in the case of raising the mosque as a whole on a mastaba, as in the (Delhi) mosque and many Indian mosques, as for the Asian mosques, their general shape was influenced by the Malay dwelling due to the nature of the area exposed to a lot of rain [budi & Wibowo, 2018, p. 4] and in the architecture of contemporary mosques, we find that many

Renewals appeared on The level of the mosque as a whole, as in the Al-Mustafa Mosque at Al-Nahrain University in Baghdad, Iraq, by the architect Walter Cropius, who used a large dome based on only three pillars to cover the entire prayer hall, and another example of the renovation that affects the shape of the building as a whole is the White Flower Mosque, which took the form of The public mosque is the shape of a flower, [Majested, 2015, p. 1] [Mahmoud & alsakkaf, 2021, p. 4].

## 7.2 Renewal at the level of external elements:

It is the case in which the renovation is located within one or more of the external elements of the mosque, and among the most important external elements in which the renovation was clearly carried out are the minarets that began as low stone towers and square in shape, as in the Umayyad Mosque in Damascus [Al-Khalifa, 2017, p. 58] Then these minarets became gradual in height, as in the minarets of North Africa and Andalusia [Mu'nis, 1981, p. 120], and after that the polygonal minaret appeared in the Fatimid era, in which the body of the minaret was reduced [Mu'nis, 1981, p. 116] and after that the minaret appeared in a form Incense burner in the Ayyubid era and occupied its position above the entrance [Saeed et al., 2018, p. 712] Double minarets were also used after that in Iran, which is one of the contributions of the Mongols to the development of Iranian mosques [karakus

2021, p. 169] The renovation also extended to another external element, which is the domes, so conical, pyramidal, and polygonal domes appeared, while in the Arabian Peninsula, domes were distinguished by shallow domes based on an octagonal base and the centrality of the site [Al-Khalifa, 2017, p. 144] The onion dome also appeared Figure in India [Waziri, p. 23]

In contemporary mosques, renewal appeared at the level of external elements, in the absence of an important group of external elements. We notice that most of the contemporary mosques were devoid of minarets or domes, or both, especially after their presence became of symbolic importance only. It is worth noting that the minaret element has been integrated into the basic design. For the mosque, it is rarely designed separately from the mass of the building, such as the White Flower Mosque in Dubai [Al-Naim, 2022, H1] and in the Ali Pasha Mosque, which was renovated by changing the structural material to create the external element, so a glass dome was used surrounded by an iron structure, as well as traditional arches and arches were used But after changing its proportions, which is a new concept that appeared in contemporary mosques, known as the concept of taqlidiya, such as the Warqa Mosque in the Emirates [Ibrahim & Al-Faisal, 2009, p. external

It became an interconnected structure of pillars, pillars, and arches, as the function of the walls was no longer carrying the roof only, but rather acting as a cover to contain the interior of the building, as well as increasing the area of the surfaces as windows in the spaces between the vertical supports [bashier, 2013, p. 59]

Among the methods of renovation that appeared on the external elements is the renovation on the facades of contemporary mosques by using glass extensively, as in the

facade of the mosque in the residential complex of the King Abdullah Center, which is preceded by a structure with decorations and geometric shapes to control light and attention to the effects of shadow and light [Mahmoud & al sakkaf, 2021 4], as well as the external appearance of Al-Siddiq Mosque in Dubai (2012) and Al-Rawda Mosque in Amman (2011) [Raouf & Al-Muqram, 2018, p. 12].

### **7.3 Renewal at the level of internal elements:**

In this level of renovation, the focus is on the interior elements of the mosque, such as the columns in the prayer hall. Short columns and fine columns that are used in pairs were invented, and in this case each pair has one crown. Marble columns were also used in the prayer halls in close rows [Mo'nis, 1981, p. 126] The lobed and double arches were also used in Andalusian mosques [Dhanoon, 2018, p. 8] Al-Sunaidi, 1998, p. 429]. As for the renovation within the element of the mihrab, the hollow mihrab appeared in the Kufa Mosque, and the hollow tiered mihrab appeared, which is in the form of a cavity with receding horizontal steps, and the renewal also included the position of the mihrab, which became not mediating the wall of the Qiblah, as in the case of the mihrab of the Umayyad Mosque [Al-Hajj Muhammad, 1976, pp. 46, 50], The renovation also included the muqarnas elements, which became more fragmented, and their arrangement consisted of three floors with an intermediate muqarnas surrounded by five tiers [Fikri, 1965, p. 165]. The renovation also appeared at the level of the prayer hall by changing its proportions and increasing its height as well. In the hall of the Esterjian Mosque [Karakuş, 2021, p. 174], and within the same level of renovation it is referred to the renovation in the middle gallery leading to the mihrab and making it wider and higher than the other corridors, especially in the prayer halls of Moroccan mosques.

In contemporary mosques, the renovation included prayer halls, which took different shapes and locations, as they became square in shape and a central location surrounded by what looks like a courtyard [Al-Naim, 2022, H3]. Underground locations were also taken for symbolic purposes and for topographical reasons, such as the Sancaklar Mosque in Turkey (Fig. 7- b) which was mentioned earlier [Özçaki,

2018, p. 436] [Al-Muqrim & Rauf, 2019, p. 13], and in some mosques the prayer hall was placed on the first floor. As for the renovation at the level of the ceiling element, in Asian mosques, especially in Malaysia and Singapore, the roof became the most dominant element in the external and internal mosque shape The mosques have a unique overlapping hierarchical roof, with a variable slope that is steeper towards the surface. These roofs had many differences in shape, composition, and proportions, as well as differences in the amount of layers constituting the roof [budi & wibowo, 2018, pg. 4, 5] [sojak & et al., 2019, p. 182].

### **4.7 Renewal at the planning level:**

This is the case in which the renovation is located within the plan of the mosque specifically, because the plan of the old mosque was not regular from the outside because it was subject to the requirements of urbanization, such as the Al-Aqmar Mosque, which adhered to the boundaries of the surrounding street. Halls were placed at the back of the



mosque [Fikri, 1965, p. 126], and a cruciform vaulted corridor appeared that divided the courtyard of the mosque into four sections open to the sky, as in the plan of the (Kalan) mosque in India [ali, 2021, p. 1295], and in contemporary mosques We notice the mosque's departure from planning The rectangle, the square, and the renovation using new planning forms that were not previously known, such as the plan of the Mashhour Youssef Mosque, which relied on the (central) stellar layout, influenced by the planning of churches with a central circular layout [Al-Naim, 2022, h. 26].

## 8. Conclusions

Through what was dealt with in the paragraph of building the theoretical framework and with the help of what was proposed by previous studies with the identification of special vocabulary for the study of methods of renewal, a group of methods that were followed within the mosque architecture during the ancient and contemporary periods were reached to achieve renewal within the architecture of mosques, as it was reached to sort and define (10) Renewal method, namely:

1. Renovation by adding new components and functionalities
2. Renewal through a change in the general form or one of its elements
3. Regeneration through a change in the visual and motor axes
4. Renewal by finding new environmental solutions
5. Renewal by creating a new relationship between the components of the mosque
6. Renewal through the introduction of local elements
7. Renewal through matching and melting with the site
8. Renovation through the introduction of new decorative methods
9. Renewal through the use of exaggeration and exaggeration
10. Renovation through the use of a new structural system and building materials

And that this renewal within the architecture of mosques with these methods achieves its appearance through 4 basic levels, namely:

1. Renewal at the level of the mosque as a whole
2. Renewal at the level of external elements
3. Renovation at the level of internal elements
4. Renewal at the planning level

And based on the most important innovative methods that the study reached, a table was made to clarify the most important conclusions of the study, its detailed vocabulary, and it's most important possible values within the architecture of ancient and contemporary mosques, which are as follows:

No	Regenerative method	Regenerative method	Regenerative method	ت
1	* Adding churches within a religious complex * Add libraries, wedding halls and dining halls * Adding a parking garage * Adding spaces for electrical and mechanical services	* Adding a school, hospital, and a path	Adding new components and functionalities	
2	* Changing the shape of the mosque is far from the usual form, so that it is difficult to distinguish it as a mosque	* Add shrines	Change in the general shape or one of the elements	
3	*Using a wall of graduated height that represents the minaret	* The appearance of hollow niches	Change in motor and visual axes	
4	* A change in the shape of the prayer halls	* Adding gardens, courtyards, and terraces	A new approach to dealing with the climatic environment	
5	*Using a mihrab and a transparent qibla wall	* Adding what is known as the lobby dome	Create a new relationship between the components	
6	* Using a prayer hall on the first floor and setting up other activities on the ground floor	The appearance of the spiral minaret	Enter local elements	
7		* The appearance of a two-headed minaret	Alignment and fusion with the site	
8	* Borrowing from local culture without dissolving in it is like borrowing tiered ceilings	Using the external staircase that revolves around the body of the minaret	Introducing new decorative styles	
9		* Reliance on interwoven fabric and the use of local building materials	Use exaggeration and exaggeration	
10	* Linking the mosque with its urban context in a harmonious and consistent manner	* Changing the location of the minaret outside the mosque	Use of new structural system and building materials	

No	Regenerative method	Regenerative method	Regenerative method	ت
1	Adding new components and functionalities	* Adding a school, hospital, and a path	* Adding churches within a religious complex * Add libraries, wedding halls and dining halls * Adding a parking garage * Adding spaces for electrical and mechanical services	
2	Change in the general shape or one of the elements	* Add shrines	* Changing the shape of the mosque is far from the usual form, so that it is difficult to distinguish it as a mosque	

3	Change in motor and visual axes	* The appearance of hollow niches	*Using a wall of graduated height that represents the minaret
4	A new approach to dealing with the climatic environment	* Adding gardens, courtyards, and terraces	* A change in the shape of the prayer halls
5	Create a new relationship between the components	* Adding what is known as the lobby dome	*Using a mihrab and a transparent qibla wall
6	Enter local elements	The appearance of the spiral minaret	* Using a prayer hall on the first floor and setting up other activities on the ground floor
7	Alignment and fusion with the site	* The appearance of a two-headed minaret	
8	Introducing new decorative styles	Using the external staircase that revolves around the body of the minaret	* Borrowing from local culture without dissolving in it is like borrowing tiered ceilings
9	Use exaggeration and exaggeration	* Reliance on interwoven fabric and the use of local building materials	
10	Use of new structural system and building materials	* Changing the location of the minaret outside the mosque	* Linking the mosque with its urban context in a harmonious and consistent manner

As for the renewal levels in which the renewal methods appeared, they are shown in the following table:

أما مستويات التجديد التي ظهرت فيها أساليب التجديد فتكون موضحة في الجدول التالي :

No	The level of renewal in contemporary mosque	The level of renewal in ancient mosques	The level of renewal s
1	* Using unprecedented vocabulary, elements and formations	* Changing the overall shape of the mosque to be in the form of a hut with the influence of local cultures	level of the mosque as a whole
2	* The presence of minarets and domes has become symbolic rather than functional and has been integrated into the original design of the mosque and not separate	Raise the mosque on a platform	external element level
3	*Using openings in large areas, paying attention to the effects of shadow and light, and paying attention to the surface treatments that cover the facades.	* A change in the proportions and heights of the mosque	internal element level
4	* Renovation of the Qibla wall by using a transparent wall to communicate with nature	Increasing the height of minarets and domes and changing their shapes	planning level

**Illustrations:**

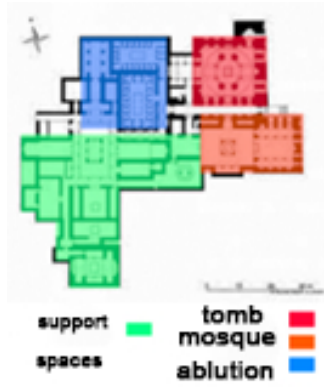
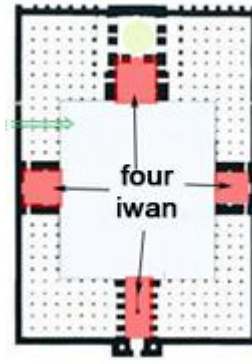


Figure No. **Error! No text of specified style in document.**-A Qalawun Mosque scheme in Cairo, [www.islamicart.museumw](http://www.islamicart.museumw)



Form 1-B Isfahan Mosque Plan with Four iwan  
 Amir Causevic



Figure No. **Error! No text of specified style in document.**-C Zitouna Mosque in Tunisia

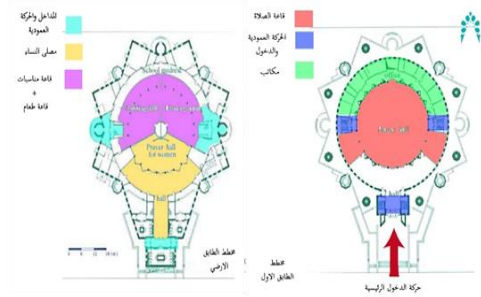


Figure No. **Error! No text of specified style in document.**-D Mashhour Yusuf Mosque in Kazakhstan  
 Analysis Prepared by the Researcher

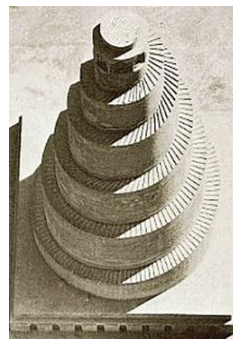


Figure No. **Error! No text of specified style in document.**-A the

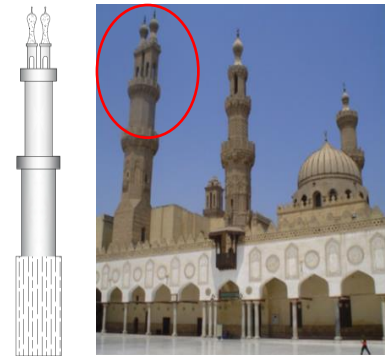


Figure 2-B Al-Ghuri minaret in Al-Azhar Mosque, Illustration prepared by the researcher, Bashier, 2013, p. 36

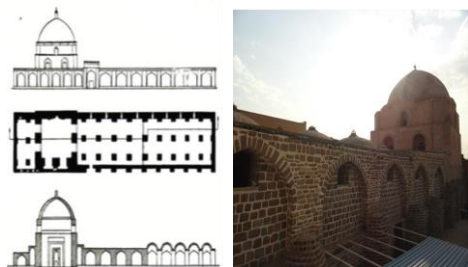


Figure 2-C Plan, section and façade of the Urmiya Mosque,



Figure No. **Error! No text of specified style in document.**-D Mosque house Peace in Indonesia, Dr. Mishari Al-Naeem, A World of



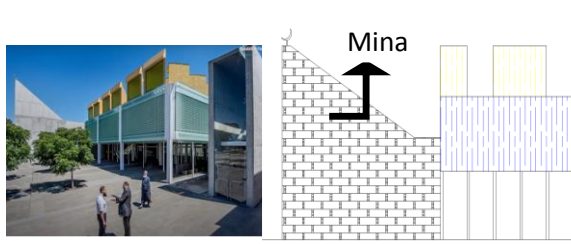


Figure No. 2-E Islamic Center in Australia, a World of Mosques, 2022, Season 2, Volume 1, and Side Illustration of the Mosque Prepared by

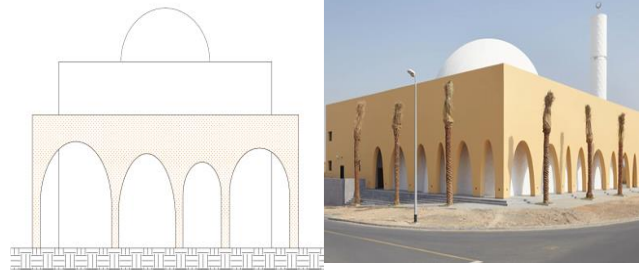


Figure No. 2-F Al Warqa Mosque in Dubai Al Naeem, 2022, Season 2, E 11, the scheme is prepared by the researcher



Figure No.3-A Entrance to Al-Aqmar Mosque , www.alhadath.net

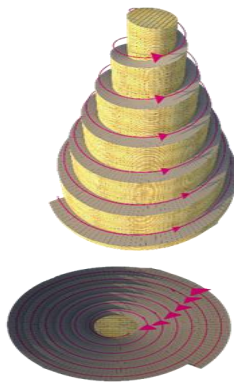


Figure No.3-B An explanatory clip of the ascent to the twisted minaret Prepared by the researcher



Figure No. Error! No text of specified style in document.-C Aman District Mosque in Bangladesh, planned by the

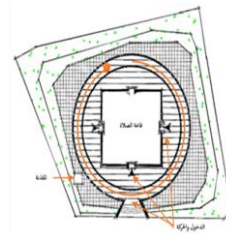


Figure No. Error! No text of specified style in document.-D Mosque Plan house Peace in Indonesia Prepared by the



مسجد قرطبة في الاندلس أشكال رقم 4-  
 www.alaraby.co.uk



Figure No. 4-B Cologne Mosque in Germany, www.noonpost.com





Figure 4-C Cyberjaya Mosque,  
 World of Mosques, 2022, Season  
 2, E7

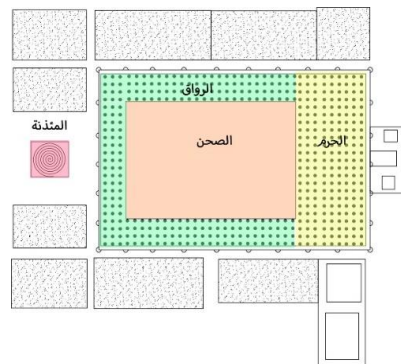


Figure 5-A Samarra Mosque Plan,  
 prepared by the researcher

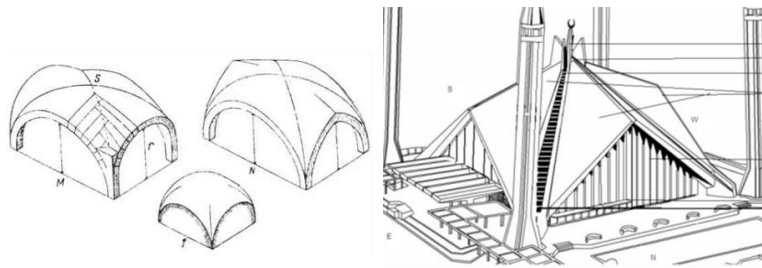


Figure No. 6-B Comparison between Faisal Mosque and Roman cellars,  
 nasim , 2008, p. 10, [www.optolov.ru](http://www.optolov.ru)

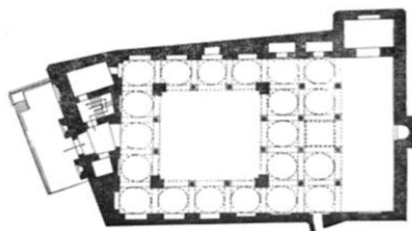


Figure No.7-A the Scheme of the al-  
 aqmar Mosque in Egypt, Fikri, 1965, p.  
 97



Figure No. 7-b  
 Sancaklar Mosque in  
 Turkey, Özçaki, 2018,  
 p.436



Figure No. 8-A Mosque yazd  
 karakus , 2021, p.171



Hosgörü Mosque in Antalya  
 – Turkey



Punchbowl Mosque in  
 Australia

Figure 8–b, Özçakı, 2018, pp. 471, 472



Figure 8–c Mosque of Strasbourg in France, Naim, 2022,  
 season 2, E 5, illustration from the researcher



Figure No. 8-D The exterior of the Al-  
 Irshad Mosque, Al-Maqram and Al-  
 Obaidi, p. 13

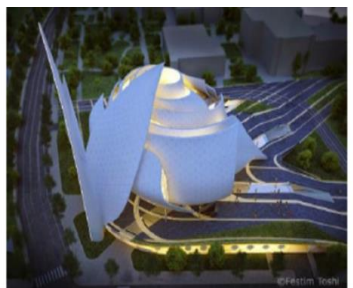


Figure No. 8-E White Flower  
 Mosque in Tirana, Al-Muqram &  
 Al-Obaidi, p. 14

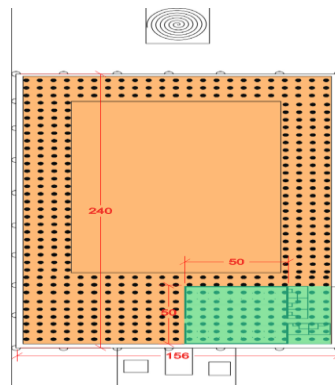


Figure 9-A Samarra Mosque  
 Plan Compared with Prophet's  
 Mosque Plan by Researcher



Figure 9-b Entrance to Al-  
 Hakim Mosque, Bashier,  
 2013, p. 42



Figure No. 9- c Blue Mosque in  
Tabriz, www.wikipedia.org



Figure No. 9-D Mashhour Yusuf Mosque in  
Kazakhstan, An-Naim, 2022, E 26



Figure 10-A Structural Shoulders Used in  
Samarra Mosque  
Prepared by the researcher

## References

1. Al khalifa, h. E. (2017). The friday mosque of the arabian gulf: defining its spatial and formal languages-1975-2010.
2. Budi, b. S., & wibowo, a. S. (2018). A typological study of historical mosques in west sumatra, indonesia. *Journal of asian architecture and building engineering*, 17(1). Doi:10.3130/jaabe.17.1
3. Dizany, e. (2017). Finding the patterns of indian mosques architecture. *The scientific journal of nazar research center (nrc) for art, architecture & urbanism*, 14(48), 73-82. Retrieved from [www.researchgate.net/publication/320058859](http://www.researchgate.net/publication/320058859)
4. Hillenbrand, r. (1994). *Islamic architecture, form, function and meaning*. Edinburgh university.
5. Karakuş, f. (2021). Urbanism and mosque architecture in ilkhanid period. Retrieved from [www.researchgate.net/publication/352226085](http://www.researchgate.net/publication/352226085)
6. Mahmoud, s., & al-sakkaf, a. (2021). *Modern trends in mosques architecture*. Montreal, canada.
7. Nasim, s. (2020). *Decorative elements of the fasial mosque islamabad*. Punjab, india. Doi:10.13140/rg.2.2.26110.20806
8. Özçaki, m. (2018). Interpreting the mosque architecture. *Ulakbilge*, 6(23), 459-483. Doi:10.7816/ulakbilge-06-23-04
9. Sojak, s., shahminan, r., & taufik, a. (2019). Mosque architectural timeline in malaysia: from vernacular to contemporary. 4th international conference on rebuilding place. Malaysia. Retrieved from [www.doi.org/10.15405/epms.2019.12.18](http://www.doi.org/10.15405/epms.2019.12.18)
10. Ahmed Abdul Wahed Thanoun. (2018). *Local Features in Islamic Architecture*.

11. Ahmed Fikri. (1965). Cairo's Mosques and Schools. Cairo: Dar Al Maaref in Egypt.
12. NJat Al-Kinani. (2017). Phenomena of renewal in modern poetry. Basra Research Journal for Humanities, 42(5), 589-618.
13. thanaa saeed. (2009). The concept of Islamic renewal in the thought of Muhammad Emara. Journal of Islamic Sciences, 3(42).
14. Hussein Munis. (1981). Mosques (vol. 37). Kuwait: National Council for Culture, Arts and Letters.
15. khalaf Al-Jubouri. (2015). Manifestations of Renewal and Creativity in Andalusian Prose. Tikrit University Journal of Humanities, 22(11), 168-196.
16. Dr. Ahmed Al-Saadani. (2019). Mosques between the past and the present: a sustainable view. Journal of urban research, 32, 109-130.
17. Dr. Asmaa Al-Maqram and Zainab Al-Obaidi. (2017). Factors affecting the trends of contemporary mosque architecture. Journal of Engineering, 23(11), 25.
18. Dr. Asmaa Al-Maqram and Zainab Raouf. (2019). The dynamics of contemporary mosque architecture. Journal of Engineering and Sustainable Development, 23(1). Doi:10.31272/jeasd.23.1.13
19. Dr. Mishari Al-Naeem. (2022). A World of Mosques. Retrieved from Al Fozan Award: <https://www.youtube.com/channel/uchhctjar9xaoc1gbbn1nocg>
20. Taher Fathy. (2013). Renewal and Classical Methodology in Twentieth-Century Architecture. Rabat-Morocco: National Ribat University Publications. Retrieved from [https://www.researchgate.net/publication/268197232\\_altjdyd\\_walnmhjt\\_alklasykyt\\_fy\\_mart\\_alqrn\\_alshryn](https://www.researchgate.net/publication/268197232_altjdyd_walnmhjt_alklasykyt_fy_mart_alqrn_alshryn)
21. Abdelkader Dahdouh (ed.). (2015). Domes in Algeria in the Ottoman Era. The general union of Arab archeologists, (pp. 608-629). Algeria.
22. Fathi Bashir. (2013). Models of the development of mosque architecture. Ethiopia: National Ribat University Publications, Khartoum. Doi:10.13140/2.1.2274.9760
23. Yahya Waziri. (2004). Islamic Architecture and the Environment. The World of Knowledge (304).
24. Bhaa Al-Saadi, and Hussein Al-Boushi. (2018). The dialectic of heritage and contemporaneity in contemporary Arab painting. Lark for Philosophy, Linguistics and Social Sciences, 2(29), 381-401.