

An Analytical Comparative Study of Contemporary Minaret Architectural Design in Jordan

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Abstract

Mosque architecture in Jordan has witnessed remarkable development in recent years. Minaret, as an important element in the mosque's design, still has the designers' attention, despite losing its traditional primary function as a place to call for prayer to the surrounding neighborhoods. This research is based on the analysis of twelve selected case studies of mosques designed by Jordanian architects to understand the common architectural trends for minaret design in contemporary mosques by focusing on the analysis of the forms, functions, elements, and characteristics of contemporary minarets. Finally, this paper's results aimed to clarify the features of the transformation of the architectural design of contemporary minarets in Jordan in order to provide a helpful reference for architects, designers, and mosque patrons.

Keywords: Modern mosques, Minaret, Contemporary Mosque design, Islamic architecture, Jordan

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دراسة مقارنة تحليلية للتصميم المعماري للمئذنة المعاصرة في الأردن

عريب الجعافرة*

ملخص

شهدت عمارة المساجد في الأردن تطوراً ملحوظاً في السنوات الاخيرة. المأذنة كعنصر مهم في تصميم المسجد، لا تزال تحظى باهتمام المصممين على الرغم من فقدان وظيفتها الاساسية التقليدية في النداء للصلاة وإيصال صوت الأذان الى المناطق المجاورة. يعتمد هذا البحث على تحليل اثنتي عشرة حالة دراسية مختارة لمساجد محلية قام بتصميمها معماريون أردنيون، وذلك لفهم التوجهات المعمارية السائدة لتصميم المآذن في المساجد المعاصرة، من خلال التركيز على تحليل التشكيل المعماري للمآذن المعاصرة، وظائفها، العناصر والخصائص المكونة لها مقارنة بالمآذن التقليدية. وأخيراً تهدف هذه الدراسة الى الوصول الى نتائج توضح ملامح التحول في التصميم المعماري للمآذن المعاصرة في الاردن من أجل توفير مرجع مفيد للمهندسين المعماريين، المصممين والمهتمين بعمارة المساجد.

الكلمات المفتاحية: مساجد حديثة، مئذنة، تصميم المسجد المعاصر، عمارة إسلامية، الأردن.

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Introduction:

The architecture of mosques is one of the most important examples of Islamic architecture, influenced by technological development and modern architectural concepts. According to Serageldin (1996) architects deals with religious architecture including mosques in contemporary cultures in three different approaches. On one hand, there are those who used limited traditional vocabulary to represent religious architectural forms. Others went to utilize industrial materials and technologies to express mosque architecture, while between those two approaches, some went to a more complex approach based on critical analysis and assessment of the contemporary condition and possibilities which is more complicated than the two previous approaches. Bloom confirmed that the most popular approach seen in all contemporary Muslim countries is to repeat the use of traditional forms of mosques using modern materials (Bloom,2013).

Throughout history minaret played many functions from being a tall tower for calling the Adhan (Hillenbrand, 2000) to act as the main prominent visual feature that stands high, reflecting the Islamic identity and indicating the existence of the place of worship (Mosque)(Bloom,2002). Nowadays, the minaret has lost its function for calling the Adhan, since the invention of loudspeakers and audio technologies (Najmul Imam, 2003). Despite the loss of its practical function, the minaret is still constructed in contemporary mosques because of its symbolic meanings.

In Jordan, the architecture of mosques has been affected by these international changes and developments, reflecting the emergence of new designs for mosques in terms of their forms and function to bring together the various elements and parts of the mosque. The Minaret as an essential element in the architectural form of a mosque has undoubtedly been influenced by the different architectural styles over the years, which is reflected in their function and form. Unfortunately, many architects still design the mosque and minarets as well in a traditional manner, but they are inclined to use modern technologies and materials (Farazmand & Sarbangholi, 2014).

Significance of the Research:

There are many previous studies in the field of mosque architecture and minaret. Nevertheless, it is only descriptive, historical, and documentary studies. This research is based on an analytical and comparative framework focusing mainly on Jordan's contemporary mosques.

The research identifies the significant architectural practices, contributions, and new concepts in contemporary mosque design. It came to fill the lack of information regarding the study of the development of minaret design in Jordan which was influenced by the impact of modern architectural movements and styles. Despite minaret still constitutes an essential architectural element in the design despite the change in its original function, which it was founded for.

Research Objectives:

This research aims to study the practices of developing and interpreting the design of minarets in terms of form and function in contemporary mosque architecture in Jordan. Through analyzing selected case studies in order to figure out and evaluate the main characteristics of these cases and answering important questions which recently been raised to the top in the discussions of architects and Islamic architecture scholars such as What are the contemporary minaret's new components, or does it still have its main traditional components? what is the relation between the minaret location and prayer hall and Qibla wall? What are the new contributions to minaret design? and if the minaret still has its main role in mosque architecture. Furthermore, the outcome of the research intends to be a helpful reference to Jordanian architects, designers, and mosque patron regarding minaret design criteria used in contemporary mosque architecture in Jordan.

Research Methodology:

To understand the characteristics of contemporary mosque architecture in Jordan, it is essential to study the characteristics of traditional mosque architecture and its role in modern design (Uray,2013). So, the first part of this research will focus on the descriptive approach through a historical background to study the origins of the minaret as a traditional element of a mosque, depending on references and books in historical Islamic architecture. Then, an architectural description for the selected case studies. While the second part will use the analytical approach by examining ten minarets in selected mosques that were chosen from different cities in Jordan and built after 2000 until the present time which Jordanian architects designed. Finally, the characteristics of these cases will be compared with the characteristics of the traditional minaret to end with a satisfying conclusion.

Literature Review:

There are many previous studies in the field of mosque architecture and minaret. Below is some of the important research on similar topics:

The study by Trad and Sqour (2016) study titled "The design of minarets between history and contemporary cases from Jordan". It is a beneficial and important study that uses the descriptive scientific approach. It is reviewed by many case studies in a historical sequence, offering information about their historical roots, architectural features and function. Nevertheless, this research does not comprehensively study the contemporary mosque. At the same time, many innovative cases built through and after this research was published need to be studied.

Hassan Haj-Kasim's (2012), research titled "Minarets of Baghdad: Monuments of Architectural Identity", is a very useful and important study, but it focused only on historical minarets design in Iraq. While this research emphasizes more on contemporary minarets. Kasim studied the minaret through nine aspects: definitions, architectural origins, the relation between the minaret and the main building, parts of a minaret, technical construction, minaret function, and symbolic meaning. The analytical framework of his research has been a model for this study to focus mainly on Jordan's mosques.

The study of Taher and Dundar (2017), "A Comparative Analytical Study of Conversion Form of a Minaret in Contemporary Mosque Architecture". This study shed the light on selected case studies that won the Aga Khan award in different countries such as Turkey, Arabia, Africa, and India. It used an analytical framework based on Kasim's study to analyze the form, new characteristics, and innovations in minaret design in contemporary architecture. So it is important to shed light on a specific area which this research will do in the analysis of Jordan's minaret design.

2. A Historical Background through Mosque and Minaret Architecture

2.1 What is Mosque?

Linguistically, the word "masjid" in Arabic is derived from the verb "sajad", which means prostrated. Moreover, the noun is "sojoud", which refers to the act of prostrating on the ground carried out by Muslims during prayer (Al-Zubaidi, 1984). So, a masjid or mosque can be defined as a place of prostration or a building designated for worship and performing the five daily prayers.

The concept of a mosque was known early since the time of the prophet Mohammad in the first year of the hijra, where the prophet's mosque (Al-Masjid an-Nabawi) in Medina in Saudi Arabia was constructed. It is considered the prototype for all mosques worldwide (Johns, 1999). The prophet's mosque was a simple structure with a flat roof and practical building (Omer, 2010). During the time of the prophet Mohammad, prayers were called from the flat roof of houses or directly from public spaces in Madinah (Imdat, 2002). Mosques were used for many functions, not only as a place for worship but also as a place for meetings of the Shure council, a learning center, a judicial center, a house for hospitality, and a media center for news broadcasting and reporting.

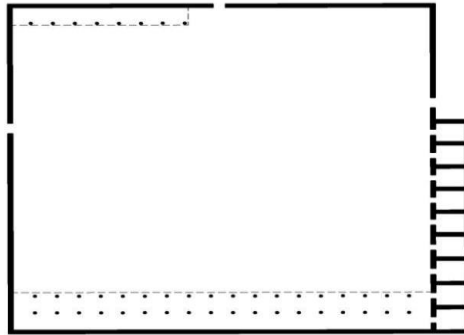


Figure (1) Reconstructed plan for the prophet's mosque in medina, source: (Khanacademy.org, 2022)

2.2 What is Minaret?

Minaret, Ma'dana, or Manara are all words that refer to a part of a mosque, which is often in the shape of a high tower adjacent or attached to a mosque designed to be used by the Muezzin for the call of prayer (Adhan). The second word Manara linguistically means "an object that gives light". Later, it was used for a "light tower" or "lighthouse". This name is derived from the light held by the Muezzin at night when he calls to prayer. (Gottheil, 1910).




During the Umayyad period (661-750), the architecture of mosques witnessed rapid development, and many elements were added, such as minarets, domes, and niches (Buhlfaia, 2000). The earliest minaret traced worldwide dates back to the early 665 AD in Bosra (Syria). Another minaret considered almost as old was built in Kairouan in Tunisia from (724-727). Later, minarets were developed and widespread under the Abbasid

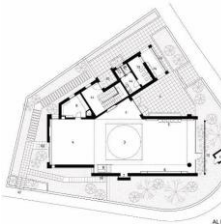




caliphate. Minaret was not only used for functional purposes as a high and visible sign for a praying place, or calling prayer five times a day or form as a watchtower (Benzine,2011). Minaret also acts as a highly visual symbol of the presence of Islam (Bloom, 2002).




3. The Selected Contemporary Case Study Mosques




The selected case studies will be reviewed in chronological order from 2000 to the present. This late period of the time lacked more research and studies about mosque design and architecture. While the previous period of time, starting from the year 1979 which considered the turning point for the relationship of the Jordanian regime to Islam and the Islamic architecture of mosques in Jordan (Sheline, 2019); when the first contemporary mosque was King Abdallah 1 mosque which was built in 1982, had been discussed in many types of research. The following table shows the features of the selected mosques (Table 1).



Table (1) Main features of the selected mosques.

Name of the mosque	Architect	Location/ Year	Architectural Description	Pictures
king Hussein bin Talal	Khaled Azzam	Amman, 2005	<ol style="list-style-type: none"> 1. Simple squared plan with a minaret in each corner. 2. An open courtyard in front of the main praying hall 3. The use of the Jordanian local white stone in all ornamentations and exterior facades (Khaledazzam.net, 2021). 4. The minaret expresses the Umayyad style through a simple squared shape element, with a balcony. A dome covers the top which made of glazed tiles that added a coppery effect (Sqour&Trad, 2016). 	  (Sqour&Trad, 2016).
Abu Ghazaleh	Rasem Badran	Amman, 2008	<ol style="list-style-type: none"> 1. Using exposed concrete facades and ceilings and exposed steel with a combination of local stone on some of the exterior facades to maintain the authenticity of the architectural design and respect the local character of mosques (daralomran.com, 2022). 	 (Researcher, 2022)

			<p>2.a square-shaped minaret attached to the building. That has two main parts: the main minaret and the spire, which are separated by a roofed balcony.</p> <p>3. the use of exposed concrete for main body of the minaret, while a steel roof covers the balcony and a steel pointed end at the top.</p>	
Al Rawda	Uraiqt Architects	Amman,20011	<p>1. it has simple geometric masses and openings, a large glass façade in the main hall elevation paralleled with a free-standing patterned wall.</p> <p>2. Used a combination of local stone with steel structures, glass, and reinforced concrete</p> <p>3.The minaret is a free-standing structure with a simple square plan that ends with a GRC pattern (Uraiqt.com, 2021).</p>	 <p>(Uraiqt.com, 2022)</p>  <p>(Researcher, 2022)</p>
Al Hamshari	Atelier White (Sameer Moghrabi)	Amman, 2011	<p>1. A simple and abstract geometric form</p> <p>2. the concrete which was reinforced with glass fibers in combination with local stone was used in the formation of the front façade, in addition to the use of abstracted Islamic decorations (squared Kufic font) (Sqour&Trad, 2016).</p>	  <p>(Researcher, 2022)</p>
Kalouti and Disi	Unknown	Aqaba, 2013		 <p>(google.com/maps, 2022)</p>

<p>Ahl Al-Quran</p>	<p>Wael-Al Masri</p>	<p>Ar-Ramtha, 2018</p>	<ol style="list-style-type: none"> 1. A geometric form with an emphasis on functionality and simplicity 2. The use of three colors of local stone, Arabic calligraphy, and Islamic decorative patterns in a more abstract way in relation to traditional Islamic architecture (waelalmasri.com, 2022) 3. An isolated minaret from the main building of the mosque. It was designed in three sections staggered in size toward the top. The shape of the crescent was subtracted in a steel plate which reflects the spirit of the modern design approach. 	 <p>(waelalmasri.com, 2022)</p>
<p>Sedqi Abu Shaqra</p>	<p>Tahhan and Bushnaq architects</p>	<p>Amman, 2017</p>	<ol style="list-style-type: none"> 1. The design reflects simplicity, purity, and clarity through its simple geometrical, clean sharp lines. 2. The use of concrete (in the earthy-colored external facades) and glass as new modern building materials and the absence of decorations or ornamentations. (tahhananbushnaq.com, 2022) 3. The minaret was built as a tall squared tower with a small platform which refers to the balcony in traditional mosques and a crescent made of glass and steel at the top. 	 <p>(tahhananbushnaq.com, 2022)</p>
<p>Al Dawood</p>	<p>Bitar consultants</p>	<p>Al-Balqa, 2019</p>	<ol style="list-style-type: none"> 1. The mosque was designed in a simple geometrical plan, using hierarchy in form composition and defining the space of the mihrab. The designer avoided the excessive use of ornamentations in the interior space and external facades. 2. A huge pointed arch, which leads to an atrium covered with a transparent skylight 	

			<p>that gives the prayer the feeling of a sacred relationship with his creator in the sky.</p> <p>3. the minaret is octagonal-shaped plan in the base, while the upper part is cylindrical and ends with a pointed cone shape painted in blue. The two sections are separated by a balcony.</p>	 <p>(bitarconsultants.com, 2022).</p>
Aisha Hamdan	Sadeen Group	Amman, 2019	<p>1. The form was designed in an abstract simple vault shape with a large glazed façade to define the main entrance.</p> <p>2. The designer focuses on using white color as the main painting for walls to reflect the meanings of purity, simplicity, and modesty</p> <p>3. The architect keeps the design of the minaret minimal and simple; he focused on using straight vertical lines and vertical glazed openings in the minaret's form which consists of three rectangular sections that gradate in size towards the top.</p>	 <p>(gerasanews.com, 2022)</p>
Habibah	Atelier white (Sameer Al Moghrabi)	Amman, 2020	<p>1. The architect used square masses, geometrical ornamentations, vertical straight lines in the design of the main façade, and large vertical glass openings.</p> <p>2. Materials were a combination of glass fiber reinforced concrete, local stone, and glass</p> <p>3. The minaret was abstracted into two vertical planes connected to the main building and topped with a steel plate that has a subtracted circular hole which refers to the crescent. And geometrical Arabic calligraphy on the sides of the minaret.</p>	 <p>(architect.sameer, 2022)</p> <p>(Researcher,2022)</p>

<p>Hudhayfah Ibn Al yaman</p>	<p>Unknown</p>	<p>Amman, 2020</p>	<ol style="list-style-type: none"> 1. The design follows the Umayyad style. A square floor plan and an open courtyard in front of the main praying hall. 2. Local stone was used as the main building material in all facades and ornamentations 3. Two symmetrical minarets in the main façade are used; a simple squared plan connected to the main mosque building, and a roofed balcony rested on muqarnas, while the top ended with a small dome and gold steel crescent. 	 <p>(Researcher, 2022)</p>
<p>Abu Bakr Al Seddiq</p>	<p>Ayman Zuaiter</p>	<p>Amman, 2021</p>	<ol style="list-style-type: none"> 1. Rectilinear and pure geometrical form. Exterior walls were painted with white color and decorated with a simple blue line at the top of these walls, which leads to more concentration on the holiness of the ritual experience of prayers. 2. The minaret was built in a square plan shape and attached to the mosque building. It has small rectangular openings at the top, then a fine blue line surrounding the minaret from all sides. It ended with an ornamented framed box carrying the crescent, all made of steel and colored blue. 	 <p>(tibahconsultants, 2022)</p>

4. Analysis Methodology, Discussion, and Results

4.1 Analysis Methodology

This section will analyze and compare the previously selected case studies according to the mosques design approaches discussed by Serageldin and Ihsan Fethi in general (Seoud,2013) and the main criteria of the minarets as classified by Kasim (Kasim, 2012).

4.1.1 Mosques Typology in Contemporary Architecture

According to the classification of mosques style approaches discussed by Ismail Serageldin and Ihsan Fethi. Mosques are classified into: (Seoud, 2013).

- 1- Vernacular approach: depends on the use of the traditional and local domestic architectural language, usually the building built by the local community.
- 2- Traditional (Conservative) approach: the design taken by the architect is usually built in relevance to the historical traditional architecture vocabulary with some modern materials and technologies.
- 3- Adaptive approach: seeks to merge traditional vocabulary and symbolism toward a modern approach.
- 4- Contemporary /modern approach: uses the modern international vocabulary reflected in pure geometry, abstracted forms (Bulgaria, 2006), and using modern structural materials and technologies. The designs should have addressed the local architectural identity.
- 5- Post-modern: post-modern characterized by creating architecture that serves the local public, using ornamentations instead of purity.
- 6- Hi-Tech approach: hi-tech architecture that uses modern technologies like structural systems, and prefabricated materials such as glass walls, steel frames, and concrete skeletal structures. Moreover, concentrate on the display of these functional and technical components. \

4.1.2 The Main Components of the Minaret (Kasim, 2012)

The elements in the contemporary minaret will be compared with the elements of the traditional minaret to see if they are the same. Kasim discussed that a traditional minaret consists of the following elements: Base, shaft, balconies, neck, and spire.

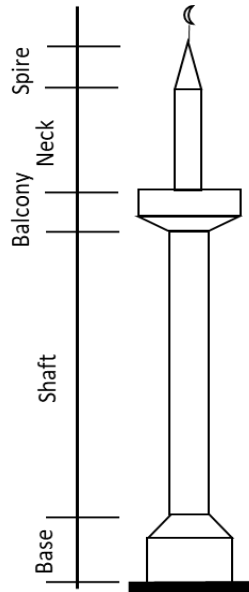


Figure 2: The Main Components of Traditional Minaret, (source: researcher, 2022)

4.1.3 The Shape of the Horizontal Section of the Minaret (Kasim, 2012)

Analyzing the sections of the minaret from the base to the spire that includes geometrical shapes: square, octagon, circular, ... to determine if the minaret has gradation toward the top or not. Since, Omary (1988) assumed that contemporary mosques have minarets without gradation in their section, which means that contemporary minarets have the same section from the base to the peak.

4.1.4 The Emphasize of Minaret in the Mosque's Composition

This focused on the powerful role of the minaret within the whole design of mosque composition. Arslan (1980) discussed that the minaret has a strong emphasis if there is more than one minaret, it would be the strongest emphasis if it dominated the whole mosque, and it would be weakly emphasized if the minaret was very thin or did not exist at all.

4.1.5 The Location of the Minaret in the Mosque Composition (Kasim, 2012)

It can be considered by the existence of the minaret, the location in relation to the direction of Qibla, the location of the minaret if attached to the building or at the corner, and the number of minarets.

4.1.6 The Abstraction and the Secondary Elements of the Minaret (Kasim, 2012)

The minaret can be considered abstract and contemporary if it is simple or complex (traditional) with secondary elements. Secondary elements can consist of traditional details such as ornamentation, symbols, Arabic calligraphy, and crescent (Kasim,2012). The minaret scale also can be considered as an edifice if the minaret has a huge scale.

4.2 Analysis and Discussion

Table (2) The Analysis of the Mosque’s Architectural Typology Approach.

Mosque/ Architectural approach	Vernacular approach	Traditional approach	Adaptive approach	Contemporary / modern approach	Post-modern approach	Hi-tech approach
king Hussein bin Talal			○			
Abu Ghazaleh						○
Al Rawda				○		
Al Hamshari				○		
Kalouti and disi				○		
Ahl Al-Quran				○		

Mosque/ Architectural approach	Vernacular approach	Traditional approach	Adaptive approach	Contemporary / modern approach	Post- modern approach	Hi-tech approach
Abu Shaqra				○		
Al Dawood			○			
Aisha Hamdan				○		
Habibah				○		
Hudhayfah Ibn Al yaman			○			
Abu Bakr Al Seddiq				○		

- 1- There is no case study that follows the traditional approach.
- 2- Two case studies follow the adaptive mosque design approach.
- 3- Eight case studies follow the modern approach.
- 4- Only one case study that follows the hi-tech mosque design approach.











































Table (3) The Main Elements of the Minaret.

Mosque / Elements	Base	Shaft	Balcony	Neck	Spire
king Hussein bin Talal mosque	○	○	○	○	○
Abu ghazaleh mosque	○	○	○	○	○
Al Rawda mosque	○	○			
Al Hamshari mosque	○	○			

Mosque / Elements	Base	Shaft	Balcony	Neck	Spire
Kalouti and disi mosque	○	○	○		
Ahl Al-Quran mosque	○	○			○
Abu Shaqra mosque	○	○	○		
Al Dawood mosque	○	○	○	○	○
Aisha Hamdan mosque	○	○			○
Habibah mosque	○	○			
Hudhayfah Ibn Al yaman mosque	○	○	○	○	○
Abu Bakr Al seddiq mosque	○	○			○

- 1- Four case studies have the traditional minaret's main parts. One of them follows the traditional design approach.
- 2- There are nine case studies out of twelve that have at least three or more of the elements of the traditional minaret.
- 3- Three case studies out of twelve have only two elements of the minaret. These minarets have only a base and shaft and follow the modern approach.

Table (4) The Geometrical Shape of the Sections of the Minaret.

Mosque / Elements		Base	Shaft	Balcony	Neck	Spire	The Result
king Hussein bin Talal							Gradates
Abu Ghazaleh							Gradates
Al Rawda							No change
Al Hamshari							No change
Kalouti and Disi							Gradates
Ahl Al-Quran							Gradates
Abu Shaqra							No change
Al Dawood							Gradates
Aisha Hamdan							Gradates
Habibah							No change
Hudhayfah Ibn Al yaman							Gradates
Abu Bakr Al- Seddiq							No change

- 1- One case study out of three that follow the adaptive approach has a minaret with different cross sections, and gradation in size along its height. While the others have the same square cross-section for the base and shaft with different spire shapes.
- 2- Four case studies have all minaret components. Three of them follow the adaptive approach. while the other follows the Hi-Tech approach.
- 3- Six case studies that follow the modern approach have a minaret with one section for the base and shaft without gradation along its height, which is easier and cheaper in construction.
- 4- There is one case study that has a minaret with the same geometrical shape but gradates in size.
- 5- Only one case (following the modern approach) has rotation for the shaft cross-section with gradation along its height.

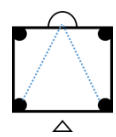
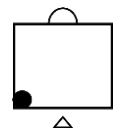
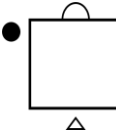
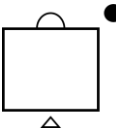
Table (5) The Emphasis of the Minaret.


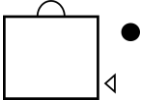

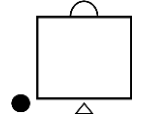




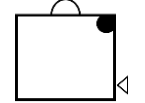



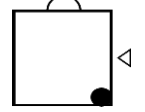



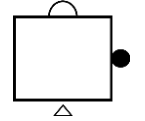




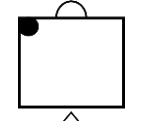



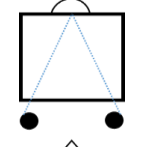




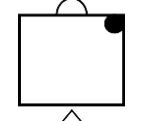
Mosque / Elements	Weak emphasize	Normal emphasize	Strong emphasize	Very strong emphasize
king Hussein bin Talal				○
Abu Ghazaleh		○		
Al-Rawda			○	
Al- Hamshari			○	
Kalouti and Disi			○	
Ahl Al-Quran			○	
Abu Shaqra			○	
Al- Dawood		○		
Aisha-Hamdan			○	

Mosque / Elements	Weak emphasize	Normal emphasize	Strong emphasize	Very strong emphasize
Habibah			○	
Hudhayfah Ibn Al-yaman			○	
Abu Bakr Al-Seddiq			○	

- 1- Most of the case studies have strong emphasis on the minaret.
- 2- Only King Hussein mosque has very strong emphasis with four minarets.
- 3- And two case studies have normal emphasis on minaret, with fair height.

Table (6) The Location of the Minaret

Mosque / Elements	The existence of the minaret	Attached to the main hall prayer	Minaret on the corner	Referring to the direction of Qiblah	The number of minarets	Location of the minaret
king Hussein bin Talal	○	○	○	○	4	
Abu Ghazaleh	○	○	○		1	
Al-Rawda	○				1	
Al- Hamshari	○				1	

Mosque / Elements	The existence of the minaret	Attached to the main hall prayer	Minaret on the corner	Referring to the direction of Qiblah	The number of minarets	Location of the minaret
Kalouti and Disi					1	
Ahl Al-Quran					1	
Abu Shaqra					1	
Al-Dawood					1	
Aisha Hamdan					1	
Habibah					1	
Hudhayfah Ibn Al-yaman					2	
Abu Bakr Al-Seddiq					1	

- The minaret
- △ Main Entrance
- ∩ Mihrab Direction
- The direction of Qiblah

- 1- All the case studies have minarets.
- 2- Four mosques have a minaret in the direction of Qiblah, one follows the adaptive approach while the rest follow the modern approach.
- 3- Only one case study has four minarets, while most have only one minaret.
- 4- Only one case study has two minarets.
- 5- There are seven case studies with minarets attached to the main praying hall.
- 6- Five case studies have a minaret separated from the main praying hall.
- 7- There are six case studies that have a minaret in the corner of the mosque.

Table (7) The Abstraction and Secondary Elements of the Minaret.

Mosque / Elements	The absence of a -minaret	Simple minaret	Ornamentations	Arabic Calligraphy	The edifice scale
king Hussein bin Talal			○		○
Abu Ghazaleh		○			
Al Rawda		○	○		○
Al-Hamshari		○		○	○
Kalouti and Disi		○			○
Ahl Al-Quran		○		○	○

Mosque / Elements	The absence of a -minaret	Simple minaret	Ornamentations	Arabic Calligraphy	The edifice scale
Abu Shaqra		○			○
Al-Dawood		○			
Aisha Hamdan		○			○
Habibah		○		○	○
Hudhayfah Ibn Al-Yaman		○	○		○
Abu Bakr Al-Seddiq		○			○

- 1- All the case studies have minarets.
- 2- Five cases have a Simple minaret style without any complex forms, ornamentation, or Arabic calligraphy.
- 3- Six case studies used ornamentations or Arabic calligraphy in the minaret design, and two were abstracted.
- 4- Ten minarets out of twelve have an edifice scale

5. Conclusion, and Results

In the end, through this comparative study and analysis, we can summarize the characteristics of contemporary minarets- in Jordan's mosques as follows:

- 1- This study shows that the minaret still exists in most mosques, this confirms that it remains an essential symbolic feature in Jordan's mosque architecture.
- 2- There was obvious attention towards designing minarets that follow the modern and contemporary architectural design vocabularies through time.
- 3- Most architects tend to design a minaret with a high emphasis on mosques that follow the modern approach; a tall iconic feature that is

- separated from the main mosque building, which is a new approach that does not appear in traditional mosques.
- 4- Contemporary minarets are simpler than traditional minarets without intricate details. Arabic calligraphy and ornamentations tend to be more geometrical and abstract.
 - 5- Because of the development of construction technologies and materials that make minaret construction easier and more economical, Jordanian designers went to be more attracted to creating new and untraditional minaret forms; most case studies have minarets with the same cross-section or base and shaft or the same geometrical cross-section but graduate in size towards the top.
 - 6- Most architects tend to respect the traditional local design aspects in Jordan; by using local building materials, especially stone, integrated with modern materials such as steel and glass fiber-reinforced concrete (GRC). In addition, in most of the case studies that follow the modern approach, architects tend to reuse Islamic architectural symbols such as ornamentation, the minaret crescent, and the balcony in a simpler and abstract form.
 - 7- It can be noticed that most of the minaret have balconies. However, the balcony in a contemporary minaret has a different form and function; designers used a window or cantilever platform as a decoration instead of a traditional balcony since there is no need to climb up the minaret.
 - 8- All the case studies have at least one minaret, although its physical function to call people to prayer may have diminished, this indicates that the presence of the minaret is remain an important symbol to define the image of a mosque and Islam throughout history in the Jordanian culture despite the mosque design approach it followed.
 - 9- In most of the case studies, the minaret has a strong emphasis on the design composition.

It is obvious that there is no specific form for minarets in the mosques that follows the modern approach and there is no mosque without a minaret in Jordan. The minaret's design process especially depends on the experience and the vision of the designer.

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