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Characterization Framework of Contemporary Mosques in Islamic Cities

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ABSTRACT

Contemporary architecture is a reflection of social status in any nation with respect to economy, traditions and culture. In addition, religious buildings express the spiritual and cultural identity of each society. The mosque is one of the most symbolic buildings of Islamic societies. Unlike historical and monumental mosques, contemporary mosques reflect the available technologies, social and cultural needs, environmental requirements as well as economic status of local society. This study focuses on analyzing the architectural features and communal role of contemporary mosques. Through the study, a framework for classifying and analyzing the design features of contemporary mosques was developed. This framework could serve as a base for surveying, identifying, analyzing and classifying information about contemporary mosques in terms of their components, area, number of floors, architectural details and style. Moreover, links were established between the features of the mosque and its functional, communal and symbolic role in its community. This framework would be useful in developing the main characteristics of contemporary mosques in terms of their social, cultural, symbolic, architectural and constructional technologies.

1. Introduction:

Despite the well-defined functionality and architectural iconography of mosques, there are many variations in their architectural expressions and functional characteristics. Functions of contemporary mosques go beyond congregational prayer (for instance, lessons and edicts are often announced after the prayer). New functions and activities in modern periods have led to the creation of additional spaces and utilities to house these activities. Therefore, it is important to define the modern functions of contemporary mosques and determine how these functions affect their architectural character and components.

2.1. Research Objectives:

- Defining the features of the contemporary mosques that play a role in the local communities.
- Developing a contemporary mosque characterization framework that relates the architectural features to the mosques' functional, social and cultural roles.

2.2. Methodology:

To achieve the research objectives this study provides a critical review of previous studies related to the mosques' design within the historical cities of the Gulf and middle eastern region and the social and economic changes that have impacted architectural design, elements, symbology and religious values of mosques. Moreover, an analytical approach was followed, in which an analysis covered key mosques within the middle east to define a framework that relates design elements and characteristics of the contemporary mosques to their communal role and spiritual importance within the local communities.

2. Contemporary Middle East Architecture:

Chadirji argued that the identity of modern middle eastern architecture cannot be shaped in isolation from advanced western architecture and its universal models. Science regionalism and Islam

are related to the preindustrial period. They are not compatible with modernity. According to Chadirji, the principles of contemporary architecture are justified by western technological advancement. Until the Arab communities catch up with the developed Western world, local Arab architecture has to be shaped through the regionalization of internationalism. However, Fathy and his scholars spent the last five decades calling for a return to the generative and formative techniques of local traditional architectural treatments. They argue that international architecture is based on western values and is incompatible with the integrity and specificity of Arab Islamic culture (SAKR, 1987). Figure 1-a and 1-b presents two architectural projects that represent the two main streams of contemporary architecture in the Arab region.

As a conclusion to this debate, architecture should reflect its surrounding natural and built-in environment and respond to them. Moreover, architecture should also adopt the users' aesthetic values and fulfill their sociocultural requirements.

The architectural visual language should employ a developed version of the local surrounding style. This built-in language comprises both: 1. a vocabulary of the fundamental forms (minaret, dome, prayer hall, etc., in the case of mosques); 2. the compositional and topological rules defined by culture (i.e. religious values in the case of mosques). Based on this general Arab architecture, the designs of the mosques should be studied in the light of the human factor, urban context and regional, historical and cultural contexts (SAKR, 1987).

Definition of a Mosque:

Hillenbrand defines the mosque as the manifestation of the mysteries of Islamic architecture and the heart of it. He believes that the mosque's role is represented in its visual landmarks, such as the minaret, dome, and pulpit. The goal of mosque architecture is to present the deepest type of unity of life (HabibAbad, 2015). Okuyucu defined the Mosque as the place where Muslims gather for worship

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and prayer, both individually and collectively (Okuyucu, 2016). By contrast, Steele argued that the mosque is not just a unique Islamic architectural building or place for worship, but that it also has many other social and communal functions. This makes the mosque one of the most important buildings in every Muslim society and one of the local townscape features that provides citizens with a sense of identity and place. However, in addition to the mosque, the marketplace, Governor's palace, citadel, and residential buildings dominate the Muslim townscape (STEELE, 1996).



Figure 1: Two Buildings Representing the Main Streams of Contemporary Architecture in the Arab Region - A: **Iraq ministry of industry and minerals**, B: **New Gournah Mosque**, Egypt.

3. Contemporary Mosque Architecture:

Throughout Islamic history, the mosque has been the center of society. Towns evolved around this central building. Today, in the Gulf and middle east region, mosques are found within a walking distance from every resident, making it a simple matter to attend the daily prayers (Kahera, 2007).

Mosques reflect the local societies at large. How identity is expressed in mosques in the different areas of the world does not depend only on cultural factors only, but also on the regional traditions of design and construction (KHAN, 2008).

Mosque design is a sensitive and unique process. It is classified as an assembly building. Its design should comply with users' properties and should be convenient to their use. Architects should respect the inherited properties that define the faith symbology and its identity as a sacred place. The design of this particular type of buildings should achieve functionality, character, and distinguishing architectural style and elements such as the minaret, mihrab, or dome, while also trying to innovate without losing the spiritual image of the mosque (Kahera, 2007).

To define the characteristics of the contemporary mosque, several categories should be defined based on:

- Architectural significance in built-in environment landscape
- Activities and purposes
- Management system
- Architectural components
- Architectural style
- Sustainability in terms of its design and material selection (STEELE, 1996).

In addition to being functional, further architectural features are required of every mosque to meet the users' aesthetic expectations. These fixed and unchanging features dictate the framework for the mosque's design. They include the following: (Abu-Dhabi, Abu-Dhabi Mosque Development Regulations - Volume 2: Design, 2016)

- Large rectangular or square separate prayer areas with separate entrances for both men and women (Kahera, 2007).
- The universal orientation of the prayer hall towards Makkah.
- A place for the imam *mihrab* and a niche in the middle of front wall that signifies the direction to Makkah to lead the prayers. This element results in the symmetrical design of mosque around its central axis (SAKR, 1987).
- A vertical and highly visible element that is identified with mosques is the minaret, where calling for the prayer, the adhan, is performed (SAKR, 1987).
- Most mosques have a pulpit, *minbr*, from which an Islamic scholar, *Imam*, deliver a speech as a part of the rituals (Kahera, 2007).

Contemporary mosque design could follow a historical or modern approach, where modern materials and techniques are imbedded within its own style and aesthetic. Figures 2-A, 2-B and 2C present three contemporary mosque design attempts where modern techniques

and religious features were merged into one innovative modern design.



Figure 2: Three Samples of Contemporary Mosques

A: Sancaklar Mosque, İstanbul designed by Emre Arolat Architects, B: **Al jabri mosque**, Hail, designed by Schiattarella Associati, C: New mosque in the Education City, Doha, Designed by Mangera Yvars Architects.

5.4.1. Types of Mosques:

Ibrahim suggested a hierarchy for mosques based on their function and relation to the surrounding urban context. The following identifies the three categories and the criteria of this classification:

- A. Cluster Masjid (daily mosque): It is the node of the housing cluster. Its serving distance should be walkable and should not exceed 150 – 200 meters. It should have a minimum capacity of 200 worshippers.
- B. Neighborhood Jame'e (Jumaa prayer mosque): It lies in the center of the neighborhood. It is a landmark whose service distance should be walkable as well and must be 250-300 meters. Additionally, it should accommodate all of the worshippers within its service zone.
- C. District jame'e (Feast prayer mosques): Should be at the edge of small towns. In the case of cities with more than 100,000 citizens there might be more than one, and they may be distributed in the district's centers. It should accommodate 40,000 worshippers or the total number of male worshippers in small towns (Abu-Dhabi, Abu-Dhabi Mosque Development Regulations - Volume 1 - Planning, 2009). The recently developed classifications adopted by the Bahraini, Abu-Dhabi and Saudi mosque development regulatory agencies follow the same classification. Some researchers like Aazam consider mosques as an object of events and social process. He argued that mosque building analyses should focus on their determinants of spatial categories and social practices (Aazam, 2007). Based on these factors, he categorizes mosques as follows:

- Single dome layout
- Multiple dome layout
- Rectangular layout
- Courtyard layout (Mourad, 2008)

5.4.2. Mosque Metrics:

The capacity of the mosque is usually determined by its categories, catchment area and the population it serves. Most standards define built-up net area per person by 1.0 square meter and up to 1.2 or 1.4 square meters, including services. Table 1 shows the areas per person for three categories of the mosques (Ibrahim, 1979) and (Abu-Dhabi, Abu-Dhabi Mosque Development Regulations - Volume 2: Design, 2016).

Table 1: Area per Person Mosque Categories:

	Local Mosques:	Collective mosques:	Feast Mosques:
Basic area	1 m ²	1 m ²	1 m ²
Service area	20%	30%-40%	5%
Total area	1.2 m ²	1.3 – 1.4 m ²	1.05 m ²

5.4.3. Mosque Elements:

The architectural elements in mosques, such as the dome, altar, minaret, etc. provide the symbolic expression of Islamic culture and reflect the image of this holy place (HabibAbad, 2015). However, there is no sacred significance to any of these elements (Aazam, 2007). Some of these elements developed over time and later lost their function but not their symbolic meaning. In the same period, new functions emerged and dictated that new elements and features be added. Based on this, the architecture of the contemporary mosque is composed of several elements (Mourad, 2008). These elements are associated with its current functions and meanings:

5.4.4. Prayer Area:

It is the main space of any mosque where the rituals are performed. Rituals confer greater merit for praying in the first row right behind the imam. Architecturally, the prayer area is usually a symmetrical

space around the Qibla axis. The Qiblah wall indicates the direction to the Kaabah and has the Mihrab at the center. Prayer hall(s), as the main element of the mosque, are sometimes celebrated by a dome, which is located above to express its centrality of the prayer area (Aazam, 2007). Prayer halls should be rectangular with their length parallel to the Qiblah wall to allow for longer praying lines, which would allow more worshippers to be in the front rows.

5.4.5. Prayer Hall Sub-elements:

Some mosques have more than one prayer hall, and these prayer halls usually have the following sub-elements:

As shown in figure 3, three elements are always found next to one another, forming the imam's praying space at the center of the Qiblah wall (Aazam, 2007).

- **The Minbar:** It is defined as a raised platform that usually takes the form of a set of stairs rising up. The Minbar is used by the imam to preach and give the sermons before or after prayer (Mourad, 2008).
- **The Mihrab:** a niche in the Qiblah wall that is usually located next to the Minbar, from which the imam leads the prayer. This feature is important acoustically, as it permits the voice of the imam to resonate (Mourad, 2008). Moreover, it acts as a spatial axis, emphasizing the Qiblah direction within the mosque's interior space (KHALIFA, 2017).
- **Imam Room:** along with the Minbar, the Mihrab is associated with the imam's space. It is usually coupled with the Minbar and Mihrab and accessed from the Qiblah wall. It serves as a rest room, private office for the imam and a preparation room for some of the social events that may take place in the prayer hall (Mourad, 2008).



Figure 3: Main Elements in the Internal Space of the Prayer Hall. A: mosque interior, Istanbul, B: Mosque, Irbil, Designed by AVA Architects.

5.4.6. Female Prayer Hall:

based on the local community statistics, females could account for 40% of the adult population, and since Islam does not oblige women to attend the daily congregational prayer at the mosque, the female prayer area should be able to accommodate up to 50% of the female adult population. This means that the overall female prayer area should accommodate up to 8% of the total population, and this percentage decreases to 4% in the case of District Jame'e. Female prayer halls are usually located on the second floor with separate entrances and sanitary facilities. The pictures in figure 4 show examples of the female prayer areas and their relation to the main hall of the mosque.

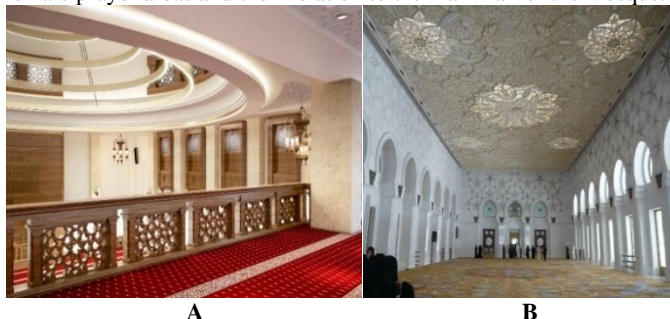


Figure 4: Female prayer halls are usually located on the second floor or at the opposite direction of the Qiblah. A: Mosque, Irbil, Designed by AVA Architects. B: Sheikh Zayed Mosque Abu Dhabi, Designed, Yusef Abdelki.

5.4.7. Ablution and Hygienic Utilities:

The ablution place, as shown in figure 5, is a row of taps that is usually located in the courtyard or near the main door of the mosque. The rituals dictate a prior personal purification before entering the prayer hall. Therefore, some daily prayers do not have a toilet since worshippers will have purification at home before coming to the Mosque. This is the reason why some mosques do not have lavatories attached to them.



Figure 5: Ablution (Rows of Taps) Either Indoor or Outdoor Located Near the Gate. A: Cambridge Central Mosque Designed by Marks Barfield. B: Al Bukhari Mosque at Mukim Kedah, Malaysia.

5.4.8. Service Spaces Related to Mosques:

the functions of this space category vary according to the category, type and location of the mosque. None of these spaces contribute directly to the ritual performance. The presence of such functions, however, shows the degree to which the mosque contributes to local activities other than the rituals. Examples of these functions include: (Aazam, 2007)

- Imam housing
- Treasuries
- Kitchens
- Storage spaces
 - Furniture and equipment store
 - Holy Quran store
 - Cleaning equipment store
- Library
- Lecture hall (Ibrahim, 1979)



Figure 6: New Spaces Added to the Main Function of the Mosque. A: Matting Room, Mosque, Irbil, Designed by AVA Architects. B: Quran reading circles, Al-Aqsa Mosque, Palestine, C: Library, Dubai, By YAAM architects.

5.4.9. Mosque Architectural Features:

Islamic architecture is not regional. The forms and features of Islamic architecture are different based on their region and religious symbolic meaning. Over time, many pre-Islamic local architectural forms and features have gradually been integrated in areas where Islam has spread. Many of these features and forms have been transformed over time to be adopted in the overall Islamic context, establishing a unique Islamic identity. Some of these features are: (KHALIFA, 2017)

5.4.10. The Minaret:

The minaret is a common feature of the mosque. The word 'minaret' is derived from the word 'manārah,' which is the light house. Thus, it can be assumed that the minarets of early mosques were inspired by the towers that were found in pre-Islamic local architecture (KHALIFA, 2017). The primary function of the minaret was to deliver the azan (call to prayer) by the muezzin. Through time, Minaret lost this function (Mourad, 2008). Its main function remains to provide a visual focal point that can distinguish the mosque from surrounding buildings.

The minarets that are found in the historic mosques of the Gulf area vary in their form and details. These variations are a result of differences in the local features, materials, and environment (KHALIFA, 2017).

5.4.11. The Dome:

Despite the arguments over the origin of the dome, it has been considered a symbolic feature in many religious cultures. Domes were found in historic Islamic architecture since the eight century. Since then, domes occupy a substantial position in traditional Islamic architecture and have become standard features of mosque buildings (Grabar, 1963, p. 196).

Domes vary in their construction methods and design styles. The same applies to the window openings that are built beneath them to allow for overhead daylight to turn the prayer hall into a calm and peaceful environment (KHALIFA, 2017).

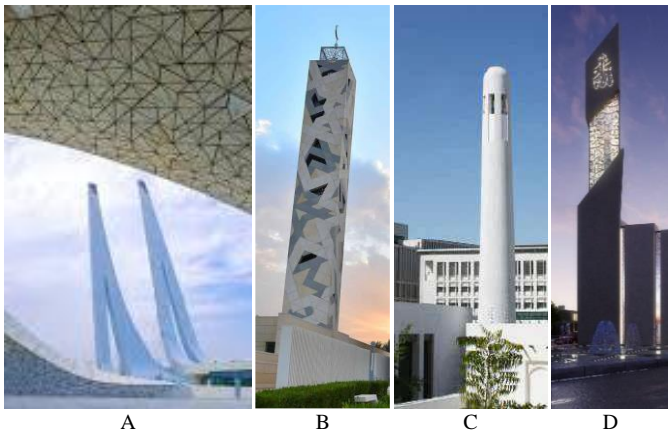


Figure 7: Different Designs of Contemporary Minarets. A: New mosque in the Education City, Doha, Designed by Mangera Yvars Architects, B: Camlica Mosque by Tuncer Cakmakli Architects in Istanbul, C: Msheireb Mosque, Doha, By AEB- Arab Engineering Bureau. D: Jenan Mosque, Khobar - Yaghmour Architects.

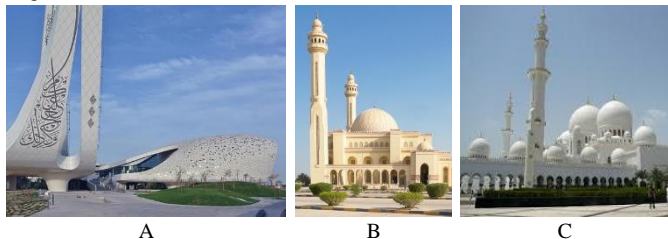


Figure 8: New Mosque Buildings With Dome Different Styles. A: New mosque in the Education City, Doha, Designed by Mangera Yvars Architects, Indonesia Henning Larsen Architects B: Al Fateh Grand Mosque, Bahrain, designed by Dar Al Handasah C: Sheikh Zayed Mosque Abu Dhabi, Designed, Yusef Abdelki.

5.4.12. Gates:

usually, mosques have several gates that lead to the surrounding streets. This provides maximum accessibility to the mosque (Aazam, 2007). The main gate usually leads to an outer court that serves as an intermediate space. Figure 9 represents three different designs of a contemporary gate for mosques in the Gulf area.



Figure 9: Three Different Mosque Gates in Contemporary Design. A: Iron Mosque, Malaysia, By GKD, B: Mohor Para Mosque, Mohorpara Bangladesh, by: A K M Tanvir Hassan Niru Nahid Akram C: Great Mosque of Sultan Qaboos, Muscat, by Mohamed Makiya.

5.4.13. Courtyard:

It can be found in some cases (as in the case of governmental and city mosques) where area is not essential. It usually acts as an extension of the prayer area and serves as an overflow area during the congregations that happen at the end of prayers (Aazam, 2007).



Figure 10: Courtyard Design of Contemporary Mosque. A: Sheikh Zayed Mosque Abu Dhabi, Designed, Yusef Abdelki, B: New Mosque in the Education City, Doha, Designed by Mangera Yvars Architects. C: Ibn Abdul Wahhab Mosque, Doha, by: Arab Engineering Bureau.

5.4.13. Openings:

Natural lighting provides the internal spaces with a pleasant environment and a lighting that is similar to the natural conditions outside the building. Having a system of openings in the walls and ceiling facilitates a direct natural lighting. These openings give the

building its style and identity and reflects its time. Those openings can be classified as follows:

Windows: Windows are narrow and screened with decorative units to prevent outside activities from disturbing the rituals. Some contemporary mosques have parametric designs, where perforated walls light up the internal space of the prayer hall (Imriyanti, 2013).

Skylight: As per the Holy Quran, Allah is the light of the heavens and of the Earth. This might be the reason why the windows for the prayer halls are elevated. Usually, the window openings that are built around the dome give the sense of light from heaven and create a spiritual peaceful environment that help worshippers to concentrate on prayer.

Doors: There is always more than one entrance to the prayer hall. Doors are always decorative and wide. Sometimes, they are made of metal or wood based on the richness of the construction materials that are used (STEELE, 1996) (Muhammad, 2016).

Pergola: This is either an outdoor or an indoor passageway that has a roof of beams and glass to allow for downward lighting (Imriyanti, 2013).

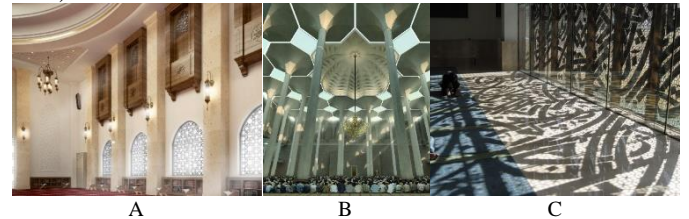


Figure 11: Lighting and Forms of Opening in the Prayer Halls of Contemporary Mosques. A: Mosque, Irbil, Designed by AVA Architects, B: Algeria Grand Mosque, Algeria, by: China State Construction Engineering, C:Kaust university Mosque, Jeddah by: Robert Bird Group Engineers.

5.4.14. Decorations and Ornamentations:

– **Exterior:** Several types of arches are used in the openings of mosques based on the local architecture style. Local designs of carved and prefabricated decorations are also used to identify the mosque (Meshary A. Al Naim, 2016).

– **Interior:** the interior details of the mosques follow the strict roles of Islamic patterns. Its main characterization is to “turn off” one’s attention from the outside environment and focus it on the inside environment. This will facilitate the required concentration (*khushu*) that is required at worship (Tajudeen Yusuf and Lukman AbdurRaheem, 2013).

– **Flooring:** in contemporary mosques, floor coverings are usually in the form of one large piece of carpet. The main reason for using carpets is to limit the noise and preserve the required quietness. Carpets that are plain or have a seamless pattern are usually used to reduce the worshipper’s distraction (Davies, 1982).

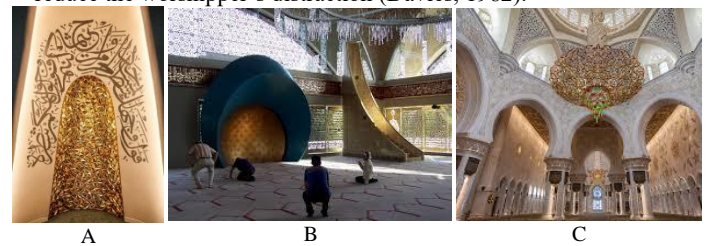


Figure 12: Interior Design Details of Contemporary Mosques. A: New mosque in the Education City, Doha, Designed by Mangera Yvars Architects, B: Mu’adh Ibn Jabal Mosque, Leicester, UK, by: CAS Architects, C: Sheikh Zayed Mosque Abu Dhabi, Designed, Yusef Abdelki.

4. Main Characteristic Features:

There are some factors contributing to the design of the mosque and its social and cultural roles within the local community. This research will attempt to define the contribution of the aspects that relate to the architectural character of the mosque and aims to identify a comprehensive frame of work that classifies them. These attributes and characterizing features are categorized as follows:

6.1. Mosque Position Within the Urban Context:

The identity of the mosque is defined by the following aspects:

- Category and Location: These factors determine the expected type and area of services that are available within the mosque.
- Location and context: Where the mosque is located and the type of urban fabric surrounding the mosque
- Catchment area: Serves the mosque and the estimated population

– Built-up area: Through which the mosque capacity and the area per worshipper can be estimated

6.2. Architectural Components:

Mosques contain elements that allow them to play their religious and ritual roles within their local communities. They may contain the following elements:

- Prayer halls: Based on its type and size, the mosque might have more than one prayer hall, one for the daily prayer, the other for the Jomaa prayer and the third for female prayer.
- Sanitary services: Purification is required prior to attending any prayer or participating in Quranic circles. Ablution places, toilets and even showers are required in most types of mosques.
- Services for the dead: Very few mosques include ceremonial burial facilities.
- Storage: Each mosque should have a storage area. Storage areas vary based on the mosque facilities and services.
- Imam housing: In mosques, specifically those at the edge of an urban city, Imam housing should be facilitated, and in some cases muezzin housing is also required.
- Shopping services: In urbanized areas, some mosques have shops at their perimeter to fund the mosque activities.
- Car parking: All of the related standards and municipal guides that regulate the location and minimum number of car parking lots should be submitted based on the economic and cultural habits of the local residents.

6.3. Architectural Features

- Minaret: It has a symbolic role rather than a functional role. It acts as a visual mark for the mosque.
- Dome: It is a traditional symbol of Islamic architecture and is utilized in covering large span of prayer area. Some mosques have several domes with different scales to reflect the importance of each element they cover.
- Gate: Gates are used to identify the mosque from its surrounding buildings. They vary in their size and decoration based on the size and category of the mosque itself.
- Courtyard: In some large mosques, a courtyard is utilized to separate the areas that require prior purification from the other areas, and it acts as an extra prayer area that can be utilized to ease congestion when worshipers leave after prayers. In many cases, the

courtyard is surrounded by a “Riwaq” which is a corridor that is covered with one or more sets of arcades.

- Minbar: One of the prayer hall sub-elements that is related to the Qiblah wall. It is used by the imam during sermons before or after prayer. It is elevated from the prayer hall floor by 60 to 200 centimeters.
- Mihrab: It is a niche in the middle of the Qiblah wall from where the imam usually leads the prayer.
- Openings:
- Gates: Usually, mosques have more than one door to allow for better accessibility. The main gate is wider and higher. Doors are usually decorated no matter their material is.
- Windows: They are usually vertical with screens on them, and sometimes they have decorative glass.
- Skylights: The upper openings match the spiritual environment, as required by rituals. The windows beneath the domes are usually adapted to light the prayer halls.
- Ancillary Building: As the functions increase and vary, the need for an attached building rises. When area is limited, the mosque building is vertical and ends up having several floors.

6.4. Communal Role

Social and cultural activities are organized and hosted within the mosque. The following activities can be hosted within the mosque:

- Quran circles: In which children, adults and women usually learn the Quran between prayers; this occurs either in a dedicated hall or within the prayer hall itself.
- Public and communal lectures: Invited speakers will give religious, social or cultural talks to mosque visitors, usually on a weekly or seasonal basis. Families usually attend these events.

Library: A separate calm hall with a reading corner and stacks area where researchers, community members and visitors can read and borrow religious books.

- Social events: A dedicated social hall that is located separately from the prayer halls and used by local community families to serve them and host their events.

5. Conclusions

Table 2: Relationship between the components of a mosque and its functional and communal roles:

		Identification				Architectural Features								Functional Components												
		Context		Location		Metrics			Minaret		Dome		Openings				Rituals			Social		Services				
		Urban features	Category	X-coordinate	Y-coordinate	Gross area	Hight	Number of floors	Cross section	Height	Diameter	Style	Shape	Screening	Materials	Court	Prayer hall	Female prayer	Toilets	Ablution	Corpse room	Lecture hall	Dining room	Events hall	Mouthen house	Storage spaces
Social and Cultural Roles	Value																									
		Urban importance																								
		Communal role																								
		Category																								
		Visual impact																								
Social		Symbology																								
		Serenity																								
		Symbology																								
Functional & Communal Roles	Religious	Daily Prayer																								
		Weekly Prayer																								
		Feast prayer & events																								
		Purification																								
		Quran circles																								
		Lectures																								
		Social events																								
		Food gatherings																								
		Corpse preparation																								
		Commercial																								
		Housing																								
		Amenities availability																								
		Ease of access																								

The mosque has always played roles other than ritual roles throughout the history of the Islamic community. In addition to their symbolic features, contemporary mosques have new features, components and styles that can fulfil the local communities and reflects their culture, technologies and economic status. Table 2 outlines the features, elements, and spatial characteristics of contemporary mosques. It also relates each one of the defined features of the mosque to its functional and communal role. These features and components are related to the ritual and communal attributes, symbolic meanings and urban values. By achieving the objective of developing a framework that characterizes contemporary mosques, the outcome of this research demonstrated in table 2 benefits both the research community and designers in relevant fields. Applying this proposed framework in such a way to statistically represent the population and the role that the contemporary mosque plays allows for the analysis of the main characteristics that are featured. Moreover, it paves the way for characterizing contemporary mosques in terms of their physical, ritual symbolic, and communal functions.

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