

Early Islamic Architecture and Structural Configurations

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ABSTRACT: Islam spread rapidly after its founding, encompassing much of North Africa, the Middle East, and Southeast Asia. The art of this vast region draws its distinctive character both from Islam itself and from the diverse cultural traditions of the world's Muslims. Because Islam discouraged the use of figurative images, particularly in religious contexts- unlike Christian art- Islamic artists developed a rich vocabulary of aniconic, or nonfigural, ornament that is a hallmark of Islamic work. This vocabulary includes complex geometric patterns and the scrolling vines known outside the Islamic world as arabesques. Figural representation, to the extent it was permitted which varied from time to time and place to place, first developed most prominently in regions with strong pre-Islamic figural traditions, such as those that had been under the control of the Roman and Byzantine empires. Stylized forms for representing animals and plants developed in the regions that had been under the control of the Sassanian dynasty of Persia (modern Iran), the heirs of the artistic traditions of the ancient Near East, who ruled from 226 to 641. Because the Arabian birthplace of Islam had little art, these Persian and Roman Byzantine influences shaped Islamic art in its formative centuries.

The elements of early Islamic architecture were formed to respond effectively to people's physical, environmental, social, physiological and religious requirements at their time. The research demonstrates that architects used to copy-paste various elements of the Islamic historical buildings in their design work without understanding the meanings and values that it holds. Such approach would only transfer the element's form though strips it from its historical context and values. The paper argues that architect should comprehend not only the hidden values of the historical elements only but also how values interacted and are integrated into these elements. By doing so, the architect would be able to correctly perceive and read these elements thus incorporate it successfully in his/ her design. This article gives perspective of early Islamic architecture and structural configurations of the related era.

Keywords: *Early Islamic Architecture, Structural configurations, Islamic Architecture's elements.*

INTRODUCTION

Much of Islamic architecture can be seen as an interplay between pure abstraction and organic form. For Muslims, abstraction helps free the mind from the contemplation of material form, opening it to the enormity of the divine presence. Islamic artists excelled in surface decoration, using repeated and expanding patterns to suggest timelessness and infinite extension. Shimmering surfaces created by dense, highly controlled patterning are characteristic of much later Islamic art, including architecture, carpet making, calligraphy, and book illustration.

Anyone who examines Islamic architecture notes that art differs from art in general in nature, characteristics and philosophy until the final outputs, it is a philosophical thought of exporting the Islamic faith and has the dimensions of the intellectual and profound philosophical implications still need a lot of studies and research to detect the components, and that comes through this research to focus the architectural heritage and architectural elements and decoration, but the richness of this heritage and richness we resort to the exact allocation and narrow the search to examine and analyze a

variety of selections from the domes of the Islamic Mamluk Egypt as architectural elements and what they contain of artistic values and aesthetic support the creative process by addressing the domes of the spirit of the times contemporary art through our culture to see the production of new structural ceramic formulations help to enrich the domes of the Islamic artistic process in general and the composition of ceramics in particular, the importance of the study is for these as one of the entrances Avenue to link the practices of the ceramic structural formations Paljmagliat emanating from the study and analysis of the Islamic Mamluk domes and through the dumping of light on the Islamic Mamluk domes and decorative elements and the linkage between the technical aspects, intellectual and practical achievements of the structural ceramic formulations.

MATERIALS AND METHODS

Architecture is a kind of art to setup the space and Islamic architecture designs its principal intent on creation a kind of space which has internal potential to put human in presence of God. Islamic architecture for creation such a holly place

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uses various techniques, one of the most standard one is polarization of building toward Kaaba. Islamic architectural space is qualified by utilizing sacred matter. This kind of polarization produces series of power line that concentrate on the center.

Researchers have proposed a number of ways to study and perceive architecture. Goss (1988) recommended that place is often “multicoded”; as people read and write different languages in the built environment, meanwhile, collective sentiments too can accord meaning to place. Rotenberg (1993) terms places as social places, or “communal sites” as are textured by multiple layers of everyday meanings and sedimented history. Hillier and Hanson (1984) have made the point that, unique among artifacts, buildings are not only shaped by the society that creates them: they also impose constraints on subsequent social actions. Hillier (1984, 1996) pointed out that spaces have qualities and characteristics that would affect people interaction and use of these spaces. He suggested two social dimensions of buildings or in other words that buildings operate socially in two ways: they constitute the social organisation of everyday life as the spatial configurations of space in which we live and move, and represent social organisation as physical configurations of forms and elements that we see. Space creates and controls the interfaces between separate categories of people and their relationships with objects. Places and buildings should be constructed to meet the demands of human beings. Maslow (1975) set the hierarchy of these needs as the following:

Physiological requirements;

Security requirements;

Belongingness and love requirements;

Esteem requirements;

Self-actualisation requirements;

The desire to know and understand;

Aesthetics requirements;

Thus buildings would address people needs and desires but how can features and values hidden in buildings can be read?

Lawson (2001) suggested a system which can be utilized to understand and study buildings thus to reveal their meanings.

This can be done by interpretation of the physical shape, form, dimensions, texture.

RESULTS AND DISCUSSION

Early Days of Islam

Muslims date the beginning of their history to the flight of the Prophet Muhammad from Mecca to Medina- an exodus called in Arabic the *hijra*-in 622. Over the next decade Muhammad succeeded in uniting the warring clans of Arabia under the banner of Islam. Following the Prophet's death in 632, four of his closest associates assumed the title of “caliph” (“successor”): Abu Bakr (Ruled 633-34), Umar (Ruled 634-44), Uthman (Ruled 644-56), and finally Ali (Ruled 656-61). The accession of Ali provoked a power struggle that led to his assassination- and resulted in enduring divisions within Islam. Followers of Ali, known as Shiites, regard him as the Prophet's rightful successor and the first three caliphs as illegitimate. Sunni Muslims, in contrast, recognize all of the first four caliphs as “rightly guided.” Ali was succeeded by his rival Muawiya (Ruled 661-80), a close relative of Uthman and the founder of the Umayyad dynasty (661-750).

Beginning in the seventh century, Islam expanded dramatically. In just two decades, seemingly unstoppable Muslim armies

conquered the Sassanian Persian Empire, Egypt, and the Byzantine provinces of Syria and Palestine. By the early eighth century, under the Umayyads, they had reached India, conquered all of North Africa and Spain, and penetrated France to within 100 miles of Paris before being turned back. In Muslim-conquered lands, the circumstances of Christians and Jews who did not convert to Islam was neither uniform nor consistent. In general, as “People of the Book”- followers of a monotheistic religion based on a revealed scripture- they enjoyed a protected status (Schacht, 1993). However, they were also subject to a special tax and restrictions on dress and employment.

Islam has proven a remarkably adaptable faith. Part of that adaptability is due to its emphasis on the believer's direct, personal relationship with God through prayer, along with a corresponding lack of ceremonial paraphernalia. Every Muslim must observe the Five Pillars, or duties, of faith. The most important of these is the statement of faith: “There is no god but God and Muhammad is his messenger.” Next come ritual prayer five times a day, charity to the poor, fasting during the month of Ramadan, and a pilgrimage to Mecca- Muhammad's birthplace and the site of the Kaaba, Islam's holiest structure- once in a lifetime for those able to undertake it. Muslims are expected to participate in congregational worship at mosque (*masjid* in Arabic) on Fridays. When not at a mosque, the faithful simply kneel wherever they are to pray, facing the Kaaba in Mecca. The Prophet Muhammad himself lived simply and advised his companions not to waste their resources on elaborate architecture. Instead, he instructed and led them in prayer in a mud-brick structure, now known as the Mosque of the Prophet, adjacent to his home in Medina. This was a square enclosure with verandas supported by palm-tree trunks that framed a large courtyard. Muhammad spoke from a low platform on the south veranda. This simple arrangement- a walled courtyard with a separate space on one side housing a *minbar* (pulpit) for the *imam* (prayer leader)- became the model for the design of later mosques.

The Relation Between Islam and Architecture

Islam outlines the fundamental human needs and wired that it should be secured. Islamic students outlined that the human wishes represented by way of: the religion, lifestyle, belongings, mind and posterity. This record of needs appears to be like Maslow's list of needs, although Maslow did not indicate the spiritual/ religious needs. Also, it can be argued that Maslow views the subject of basic needs from the individual's point of view only whereas Islam views basic needs from three perspectives: legislative, individual and state (Al Sari, 2010). It is however suggested that Islamic buildings express the religious beliefs, social and economic structure, political motivation and visual sensibility of a pervasive and unified tradition (Michell, 1978). Therefore, one can argue that traditional architecture in Islamic countries have been developed in response to several factors that characterize each country such as people's needs that highlighted above, the climate, the available building materials, the level of construction technology that is used, the level of society's prosperity, and the local architectural traditions and practices prior to the Islamic governance in that country.

Architecture in the Islamic Civilization

The reduction of architecture that evolved in the Islamic

civilization in one term is the underestimation of civilization and cultural achievement produced by the Islamic civilization (Bahnessi, 2003). The only decoration and adornment configuration is a complete deviation from the cultural depth provided by the Islamic civilization. The use of the term “architecture in the Islamic civilization” as a general framework, while likely to use the term special care of the maintenance of each historical period on the unit such as “Architecture of Islam” or “Architecture Umayyad Early” of “Architecture Abbasid” as well as we can in this regard, looking deeply and in detail in the buildings’ differing features that arose over the Islamic civilization: geographical and temporal differences between them are models of architecture in different regions of the Islamic call to reach a comprehensive and logical point to Islamic architecture (Hakim, 1991).

Architectural and Structural Systems During the Early Caliphates

The caliphs of the aggressively expansionist Umayyad dynasty ruled from their capital at Damascus (in modern Syria). They were essentially desert chieftains who had scant interest in fostering the arts except for architecture and poetry, which had been held in high esteem among Arabs since pre-Islamic times. The building of shrines and mosques throughout the empire in this period represented both the authority of the new rulers and the growing acceptance of Islam. The caliphs of the Abbasid dynasty, who replaced the Umayyads in 750 and ruled until 1258, governed in the grand manner of ancient Persian emperors from their capitals at Baghdad and Samarra (in modern Iraq). Their long and cosmopolitan reign saw achievements in medicine, mathematics, the natural sciences, philosophy, literature, music, and art. They were generally tolerant of the ethnically diverse populations in the territories they subjugated and admired the cultural traditions of Byzantium, Persia, India, and China. As Islam spread, architects adapted freely from Roman, Christian, and Persian models, which include the basilica, the *martyrium*, the peristyle house, and the palace audience hall. The Dome of the Rock in Jerusalem (Fig. 1 and 2), built about 687-91, is the oldest surviving Islamic sanctuary and is today the holiest site in Islam after Mecca and Medina.

The building stands on the platform of the Temple Mount (Mount Moriah) and encloses a rock outcropping that has also long been sacred to the Jews, who identify it as the site on which Abraham prepared to sacrifice his son Isaac. Jews, Christians, and Muslims associate the site with the creation of Adam and the Temple built by Solomon. Muslims also identify it as the site from which Muhammad, led by the angel Gabriel, ascended to heaven in the Night Journey, passing through the spheres of heaven to the presence of God.

The Dome of the Rock was built by Syrian artisans trained in the Byzantine tradition, and its centralized plan- an octagon within an octagon- derived from both Early Christian and Byzantine architecture. Unlike its Byzantine models, however, with their plain exteriors, the Dome of the Rock, crowned with a golden dome that dominates the Jerusalem skyline, is opulently decorated with tiles outside and marble veneer and mosaics inside. A dome on a tall drum pierced with windows and supported by an arcade composed of alternating piers and columns- two columns to one pier in the outer ring, three to one in the inner- covers the central space containing the rock. Concentric aisles (ambulatories) permit the devout visitor to circumambulate the rock. Inscriptions from the Koran interspersed with passages from other texts and commentary, including information about the building, form a frieze around the inner wall. The pilgrim must walk around the central space first clockwise and then counter clockwise to read the inscriptions in gold mosaic on turquoise green ground. These texts are the first use of monumental Koranic inscriptions in architectural decoration. Below the frieze, the walls are covered with pale marble, whose veining creates abstract symmetrical patterns, and columns with shafts of gray patterned marble and gilded capitals. Above the calligraphic frieze is another mosaic frieze depicting thick, symmetrical vine scrolls and trees in turquoise, blue, and green, embellished with imitation jewels, over a gold ground. The mosaics are thought to represent both the gardens of Paradise and



Fig. 1: Dome of the Rock, Jerusalem. Israel. Interior. C. 687-91. (Source: Duroodsharifwalimasjid, 2013)

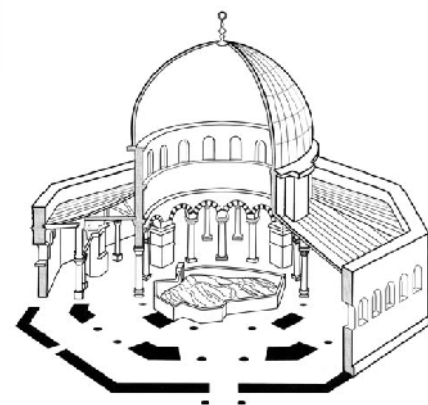


Fig. 2: Cutaway drawing of the Dome of the Rock (Source: Amazonaws, 2013)

trophies of Muslim victories offered to God. The focal point of the building, remarkably enough, is not the decorative program- or depicting thick, symmetrical vine scrolls and trees in turquoise, blue, and green, embellished with imitation jewels, over a gold ground. The mosaics are thought to represent both the gardens of Paradise and trophies of Muslim victories offered to God. The focal point of the building, remarkably enough, is not the decorative program- or containing the rock. Concentric aisles (ambulatories) permit the devout visitor to circumambulate the rock. Inscriptions from the Koran interspersed with passages from other texts and commentary, including information about the building, form a frieze around the inner wall. The pilgrim must walk around the central space first *clockwise* and then *counterclockwise* to read the inscriptions in gold monuments. Koranic inscriptions in architectural decoration. Below the frieze, even something that can be seen. From the entrance one sees only pure light streaming down to the unseen rock, surrounded by color and pattern. After penetrating the space, the viewer/worshiper realizes that the light falls on the precious rock, and in a sense re-creates the passage of Muhammad to the heavens. The Umayyad caliphs, disregarding the Prophet's advice about architectural austerity, built for themselves palatial hunting retreats on the edge of the desert. With profuse interior decoration depicting exotic human and animal subjects in stucco, mosaic, and paint, some had swimming pools, baths, and domed, private rooms. One of the later desert palaces was begun in the 740s at Mshatta (near present-day Amman, Jordan). Although never completed, this square, stone-walled complex is nevertheless impressively monumental (Fig. 3). It measured about 470 feet on each side, and its outer walls and gates were guarded by towers and bastions reminiscent of a Roman fort. The space was divided roughly into thirds, with the center section containing a huge courtyard. The main spaces were a mosque and a domed, basilica-plan audience hall that was flanked by four private apartments, or *bayts*. *Bayts*

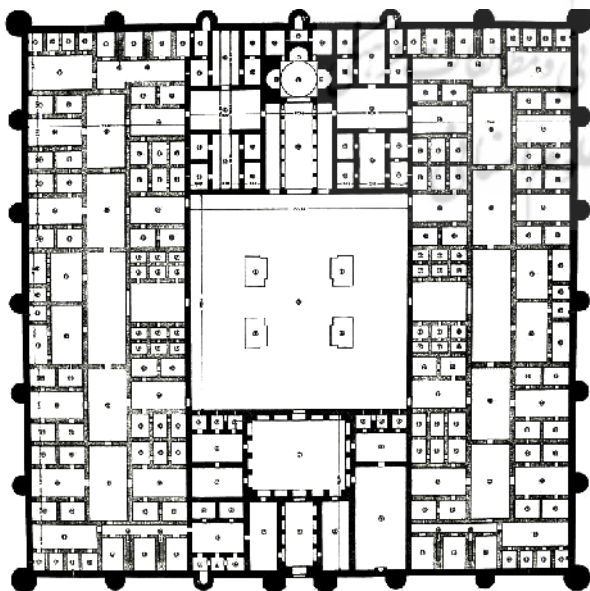


Fig. 3: Plan of the palace, Mshatta, Jordan. Begun 740s.
 (Source: IRCICA, 2013)

grouped around small courtyards, for the use of the caliph's relatives and guests, occupied the remainder of the building. Unique among surviving palaces, Mshatta was decorated with a frieze that extended in a band about 16 feet high across the base of its facade. This frieze was divided by a zigzag molding into triangular compartments, each punctuated by a larger rosette carved in high relief (Fig. 3 and 4). The compartments were filled with intricate carvings in low relief that included interlacing scrolls inhabited by birds and other animals (there were no animals on the mosque side of the building), urns, and candlesticks (Hammad, 1997).

The mosque was and is the Muslim place for communal worship, and its characteristic elements developed during the Umayyad period (Hakim, 1986). The earliest mosques were very simple, modeled on Muhammad's house. The mosque's large rectangular enclosure is divided between a courtyard and a simple columnar hall (the prayer hall), laid out so that worshipers face Mecca when they pray. Designating the direction of Mecca are the qibla wall and its mihrab (a niche); the plan of identical repeated bays and aisles can easily be extended as congregations grow (Hakim and Rowe, 1983). The origin and significance of the mihrab are debated, but the mihrab is within the tradition of niches that signifies a holy place- the shrine for the Torah scrolls in a synagogue, the frame for the sculpture of gods or ancestors in Roman architecture, the apse in a church. The maqsura, an enclosure in front of the mihrab for the ruler and other dignitaries, became a feature of the principal congregational mosque after an assassination attempt on the ruler. The minbar, or pulpit/ throne, stands by the mihrab as the place for the prayer leader and a symbol of authority (for a fourteenth-century example, Fig. 8-14). Minarets, towers from which the muezzins, or criers, call the faithful to prayer, rise outside the mosque as a symbol of Islam's presence in a city.

When the Abbasids overthrew the Umayyads in 750, a survivor of the Umayyad dynasty, Abdar-Rahman I (Ruled 756-88), fled across North Africa into southern Spain (known as al-Andalus in Arabic), where, with the support of Syrian Muslim settlers, he established himself as the *provincial ruler, or emir*. While the caliphs of the Abbasid dynasty ruled the eastern Islamic world from Baghdad for five centuries,



Fig. 4: Prayer hall, Great Mosque, Cordoba, Spain. Begun 785-86, extension of 987. (Source: IRCICA, 2013)

the Umayyads continued their dynasty in Spain from their capital in Cordoba for the next three centuries (756-1031). The Umayyads were noted patrons of the arts, and one of the finest surviving examples of Umayyad architecture, the Great Mosque of Cordoba, thus is in Spain (Fig. 4 and 5).

In 785, the Umayyad conquerors began building the Cordoba mosque on the site of a Christian church, loiter rulers expanded the building three times, and today the walls enclose an area about 620 by 460 feet, about a third of which is the courtyard, the Patio of the Orange Trees. Inside, the proliferation of pattern in the repeated columns and arches and the double flying arches is almost disorienting. The marble columns and capitals in the hypostyle prayer hall were recycled from the ruins of classical buildings in the region, which had been a wealthy Roman province. Two tiers of arches, one over the other, surmount these columns; the upper tier springs from rectangular posts that rise from the columns. This double-tiered design, which was widely imitated, effectively increases the height of the interior space and provides excellent air circulation. The distinctively shaped horseshoe arches- a form known from Roman times and favored by the Visigoths, Spain's pre-Islamic rulers- came to be closely associated with Islamic architecture in the West. Another distinctive feature of these arches, also adopted from Roman and Byzantine precedents, is the alternation of pale stone and red brick *voussoirs* forming the curved arch.

In the final century of Umayyad rule, Cordoba emerged as a major commercial and intellectual hub and a flourishing center for the arts. It surpassed Christian European cities economically and in science, literature, and philosophy. Beginning with Abdar-Rahman III (Ruled 912-61), the Umayyads boldly claimed the title of "caliph." Al-Hakam II (Ruled 961-76) made the Great Mosque a focus of his patronage, commissioning costly and luxurious renovations that disturbed many of his subjects. The caliph attempted to answer their objections to

paying for such ostentation with an inscription giving thanks to God, who "helped him in the building of this eternal place, with the goal of making this mosque more spacious for his subjects, something which both he and they greatly wanted". Among al-Hakam's renovations was a new mihrab with three bays in front of it. The melon-shaped, ribbed dome over one bay seems to float over a web of intersecting arches that rise from polylobed, intersecting arches rather than supporting piers (Fig.5). Lushly patterned mosaics with inscriptions, geometric motifs, and stylized vegetation clothe the domes in brilliant color and gold.

Elements of Architectural and Structural Systems

The earliest mosques were pillared hypostyle halls such as the Great Mosque at Cordoba (Fig 6).

Approached through an open courtyard, the *sahn*, their interiors are divided by rows of columns leading, at the far end, to the mihrab niche of a qibla wall, which is oriented toward Mecca (Critchlow, 2004).

A second type, the four-iwan mosque (Fig. 7), was originally associated with madrasas (schools for advanced study). The iwans- monumental barrel-vaulted halls with wide-open, arched entrances- faced each other across a central *sahn*; related structures spread out behind and around the iwans. Four-iwan mosques were most developed in Persia, in buildings like Isfahan's Masjid-i Jami (Fig. 8).

Central-plan mosques, such as the Selimiye Cami at Edime (Fig. 9), were derived from Istanbul's Hagia Sophia (Fig. 10) and are typical of Ottoman Turkish architecture. Central-plan interiors are dominated by a large domed space uninterrupted by structural supports. Worship is directed, as in other mosques, toward a qibla wall and its mihrab opposite the entrance (Omar, 2000).

Islamic builders used a number of innovative structural devices. Among these were two arch forms, the horseshoe



Fig. 5: Dome in front of the mihrab, Great Mosque. 965. (Source: IRCICA, 2013)

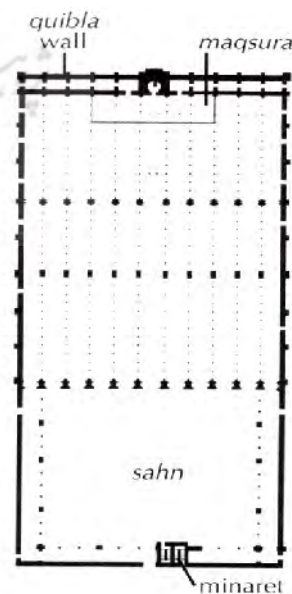


Fig. 6: Central plan of hypostyle mosque, Great Mosque, Cordoba, after extension by al-Hakam II (Ruled 961-76) (Source: IRCICA, 2013)

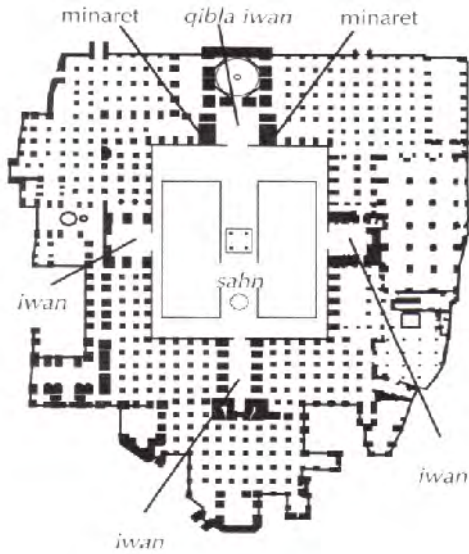


Fig. 7: Central plan of four-ivan mosque, Masjid-I Jami, Isfahan.
 (Source: Amazonaws, 2013)



Fig. 8: Masjid-I Jami, Isfahan.
 (Source: IRCICA, 2013)

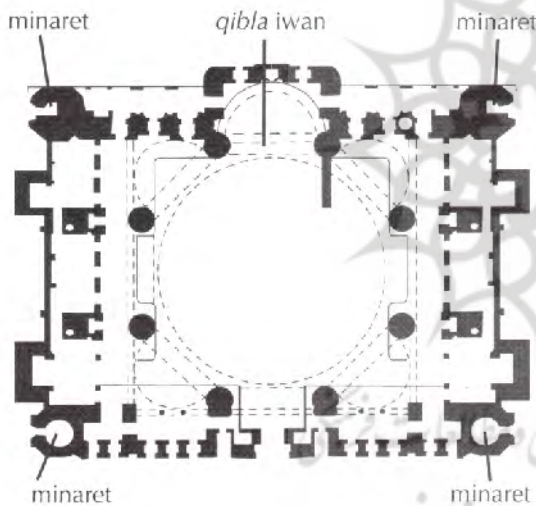


Fig. 9: Central-plan of Selimiye Camii (Mosque of Selim),
 Edirne, Turkey. 1570-74. (Source: IRCICA, 2013)



Fig. 10: Hagia Sophia, Istanbul, Turkey. 537.
 (Source: IRCICA, 2013)

arch (Fig.11) and the pointed arch (Fig. 11). There are many variations of each, some of which disguise their structural function beneath complex decoration. Structurally, a muqarna is simply a squinch. Muqarnas are used in multiples (Fig. 11) as interlocking, load-bearing, niche-shaped vaulting units. Over time they became increasingly ornamental and appear as intricately faceted surfaces (Omer, 2010). They are frequently used to vault mihrabs and, on a larger scale, to support and to form domes.

CONCLUSION

The study demonstrates that Islamic Architectural heritage's elements that we see at present, was created

regarding to a number of social, psychological, religious, environmental forces and constraints. The research has proposed a conceptual model that outlines the above mentioned forces and the target of this model is to enable researchers to correctly analyze, perceive and read the Islamic architectural heritage. The model suggested that the physical properties of the historical features should be analyzed. Thus the analysis should be combined with an examination of the historical archive of the historical area/building - under study-, archaeological inspection, and a field survey that explores the views of the residents of the historical area and building about the meanings of the historical features. Archaeological research would reveal certain facts about how people lived, how they

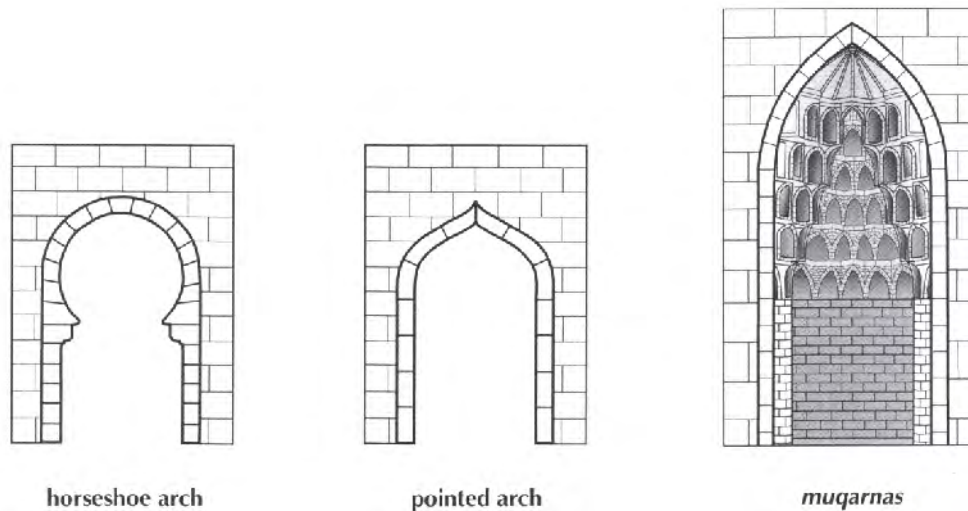


Fig. 11: Various arch forms used in structural configurations
(Source: Wikipedia, 2013)

socially and economically interacted and the outcomes can be linked to the architectural research. This may clarify the type and cost of materials that were used, why and how. The outcome of such inspection would help the professional architect's to develop better understand of the traditional Islamic elements thus he/ she would be able implement it successfully in the present and future Architectural design of buildings in the Islamic world.

Given the depth of the decline in cultural identity, there is huge scope for further research within this area. There are numerous other examples of loss of cultural identity, particularly within areas of the creative arts, together with broader areas of cultural decline within Islamic countries. Creating incentives and opportunities for more localised production, that utilises local materials, skills and traditions, could also be an invaluable area of further investigation.

The results also illustrate that there is a common connection amongst the degrees of the architectural work the part, the parts and the complete in various types and sizes of Islamic architecture constructs, such as making the system of proportional relations unified and classified by inclusiveness and integration through the following:

Proportional relations in Islamic architecture lean on the process of preferred dimensions which is recognized by the unity of its system aspects proportions that imparted unity on the architectural constructs through the positioning of variables that identify the measurements system in certain proportions extremely convergent in all the architectural models.

The proportional relations in the Islamic architecture that is dependent on the favorite relations is based on the following:

Repetition: Categorized by following a standard module reiterated by the multiplications and the parts of the standard module of the same construct. A capacity for expansion is available by multiplying the volumes which, in turn, results in the continuity of construct structure as a whole by multiplying itself with a different measurement -inclusive repetition- in a straight linear shape, such that constituting a net of reiterated

modules that are -combined with the same reproducing module without being combined in size and measurement- around a given center of the construct.

Symmetry: Categorized by adopting regular pure geometrical shapes for the entire construct around a point -a central position- or around axis with constructional relations per constant system of dimensions.

Balance: Categorized by adopting the formal and imparts the visual balance to the construct amongst the dynamic shapes like the circle and the stable ones like the square per constant system of dimensions.

Gradation: Categorized by adopting the progression idea from what is considered secondary towards what is regarded a principal whether as a result of orienting towards what is being principal for its strategic subscription or for its extraordinary measurement through the gradation of relations among the part, the parts and the whole, such as confirming the elaborate integration in those relations in Islamic architecture constructs.

All of it introduces a cultural species for the Islamic architecture that is characterized by a unified system for the dimensions that include the noble proportions, a unified system for the relations which has the characteristic of constructional flexibility through frequency, high centralization plus preserving balance and evident symmetry.

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