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Original Research Article

Wooden Capitals in Iranian Architecture: A Comprehensive Study of the Wooden Capitals of Historical Mosques in East Azerbaijan

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Abstract

Wooden capitals in wooden mosques are important elements of this type of architecture and are indicative of the artistic taste and cultural heritage of the artist or architect who created them. There are notable examples of such works in northwest Iran, on which limited studies have been conducted to date, indicating the necessity for comprehensive research to their introduction. The aim of this research is to conduct an applied study and investigate the vertical wooden capitals of East Azerbaijan, focusing on the examination and analysis of selected samples from an artistic and technical perspective. This involves the dissection and analysis of the components that make up the studied capitals, including complete elements, shapes, compositions, connections, and construction techniques. The research method used is descriptive-analytical, which delves into the form, geometric characteristics, construction process, and constituent elements of the capitals and compares and contrasts the components of capitals in historical and wooden mosques selected for analysis. Due to the compatibility and durability of wood in the climatic conditions of East Azerbaijan province, its use as a prominent element in architecture has been welcomed by a segment of artists and architects in Azerbaijan, especially in regions such as Bonab, Ajabshir, and Maragheh. The delicacy and workability of wood have led to the creation of exquisite capitals with sometimes differing geometries, and while these capitals may appear similar at first glance, the analysis shows that there are differences in terms of geometry, formal details, and constituent elements among them. It is worth noting that these differences do not seem to be visible in the construction technique of the analyzed samples, suggesting that the construction process in these cases has been similar, possibly influenced by artists inspiring each other in creating these works.

Keywords: *Iranian-Islamic architecture, Wooden mosques in Azerbaijan, Wooden capitals, Wooden columns, Wooden muqarnas.*

Introduction

Mosques, as religious and cultural centers in Islamic societies, hold great significance. Throughout history, mosques have exhibited diverse designs and architectures influenced by the cultures and local traditions of each region. Mosque architecture encompasses various patterns, ranging from hypostyle to four-iwan and four-taqi layouts. The typical feature of the hypostyle pattern is a space with multiple yet orderly columns, also referred to as "Shabestan"[1], "Chihil Sutun"[2] or "Setavand"[3] due to its forty pillars. One of the most essential design

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elements in mosques following the hypostyle plan, which significantly impacts the beauty of these spaces, is the wooden columns adorned with various decorative motifs and crafted from different materials. Artisans sought to embellish the hypostyle spaces of mosques using decorative elements such as "muqarnas", "patkaneh", or other distinctive features to enhance the beauty of these spaces. This construction technique could utilize various materials. The materials used for constructing muqarnas vary across Islamic regions. For example, in Syria, Egypt, and Turkey, muqarnas are primarily made of stone (Garofalo, 2011, 357). Conversely, in Azerbaijani mosques, they are mainly crafted from wood. The wooden columns, as pivotal and influential components shaping mosque architecture, have captured the attention of researchers and enthusiasts. This study provides a comprehensive examination of the wooden columns in East Azerbaijani mosques, exploring their historical and significant elements. East Azerbaijan, with its long history and dome-centered culture, boasts mosques adorned with beautiful and unique wooden columns. These structures not only play a vital role in preserving the history and culture of the region but also serve as examples of woodworking artistry in Iran. The investigation begins with an exploration of the history and design of these wooden columns, which have been a focal point in various architectural styles, from simple to intricately ornate forms. These columns, designed and created in compliance with artistic and cultural norms, have produced exquisite and popular artistic and cultural works. By utilizing various woodworking techniques, architects have crafted columns with captivating and innovative decorations and patterns. Factors influencing the design, formation, form, and structure of wooden columns are also examined in this research. The culture, history, and social conditions of the people in this region have considerably impacted the design and symbolism of mosque columns. Therefore, this study of East Azerbaijani mosque wooden columns aims to explore the historical and artistic elements associated with mosque design. This article can serve as a valuable resource for individuals interested in mosque architecture and art, providing insights into the characteristics of wooden columns within these religious and cultural structures.

Research Methodology

This research is structured based on a developmental objective with a historical nature. Initially, field photographs of the wooden columns were taken to provide better and more accurate visualization, and then selected samples were modeled three-dimensionally using Rhino 3D software. Limited samples of elaborately carved and luxurious wooden mosque columns from Azerbaijan are introduced in this study. After evaluating the quality and diversity of the columns in the studied mosques of Bonab, Maragheh, and Ajabshir cities, three samples (Kabood Bonab Mosque, Mehrabad Bonab Mosque, and Zavaragh Mosque) are selected for detailed and in-depth examination. Subsequently, through fieldwork and library resources, the selected samples are analyzed and described using analytical and descriptive methods.

Literature Review

Studies on wooden columns can be found in various sources, each of which has addressed the form and position of columns in different epochs and structures. However, studies focusing specifically on the shape, form, and structure of columns have been rarely undertaken, with most attention being devoted to the columns themselves and their motifs, while the form, geometry, and construction techniques of the columns have been overlooked. Some of the significant studies in this field include the following: Valibeig & Rahravi Poodeh (2017) classified and analyzed the geometric forms of stone columns in post-Islamic Iranian public buildings, categorizing and analyzing the column elements (base, shaft, and capital). Belali Oskoyi & Ashtiani (2020) investigated the evolution and origins of wooden columned halls in Azerbaijan, focusing on the formation of these halls and columned mosques in the northwest region of Iran (Azerbaijan) and tracing their evolution. Ghaffari Heris and Fasihi (2018) provided an analytical perspective on the architectural decorations

of wooden columns in Maragheh mosques, examining the wooden decorations in Maragheh mosques from an artistic perspective. Soleimani et al. (2011) compared the wooden decorative structures of the Abianeh Jame Mosque with the wooden mosques of East Azerbaijan, exploring the elements, similarities, and differences between the wooden mosques of East Azerbaijan. Dehghan (2010) in his book "Wooden Carvings of Mosques in Azerbaijan" introduced and described the architecture and decorations of wooden mosques in East Azerbaijan, focusing specifically on the patterns and calligraphy. Kheyri (2006) in his book "Architecture and Decorations of Wooden Columns in the Safavid Period in Azerbaijan " conducted a general examination of the art and architecture of wooden columned mosques in Azerbaijan. Varjavand (1976) studied the Malarstom Mosque in Maragheh in his article " Forty Columns of the Mosque of Mollarestam in Maragheh (a magnificent work of Iranian wooden architecture in the 10th century AH)". However, research is scarce on the columns and wooden capitals, with limited studies conducted. Among the existing studies, Madhoushian & Shishvani (2017) in their article "Study of Muqarnas-Style Wooden Columns in the Malek Mausoleum Mosque in Maragheh" examined the diversity in the wooden column capitals of Maragheh Mosque in terms of form and execution. Additionally, Neqabi (2014) in her article "Evolution of Column Structure in Iranian Architecture" presented the evolution of the constituent elements of columns with circular sections from the Achaemenid period to the Pahlavi era. This current study also focuses on examining the formal, geometrical, and construction techniques of wooden columns.

Theoretical Foundations

• Columns in Iran

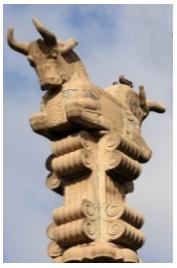
Columns, as decorative or functional elements, should be examined alongside pillars. This is because a column is divided into three parts: the base, shaft, and capital (Rafiezadeh et al., 2004). Arthur Pope (1991, 21) traces the history and background of columns back to 4600 years ago in the city of Uruk while Mohammad Taghi Mostafavi (1968, 17) attributes the origin of the columns to the mounds of Mosian in Dehloran dating back 6,000 years. On the other hand, Daniel Potts (2006, 515) concedes that columned halls in Iran were first created by the Manaean government at the Hasanlu Tepe, and the Medes later followed a similar architectural style in creating columned halls, which later influenced the Urartian architecture. Columns can be considered a fundamental part of a building structure and are also used in the facade. Throughout history, columns and pillars have appeared in various forms and shapes, and the following provides a brief introduction to different examples from different eras before and after Islam in Iran.

In various periods, the use of columns in architectural structures was prevalent. Elamites are among the Iranian tribes that used columns in their buildings. In later periods, particularly during the Achaemenid era, columns played a significant role in architecture. The palaces of the Persepolis complex, Pasargadae, Susa, Hegmataneh, and the Temple of Anahita are among the most important stone structures in Iran where the columns are considered prominent features (Mahmoudian & Mahmoudian, 2019, 1). One of the most famous examples of this is the columns of Persepolis from the Achaemenid era. These columns, made of a single piece of stone, reach a height of approximately 19 meters. In the architectural elements of the stone era, various types of capital designs can be observed, such as the form of a cow, human, horse, lion, etc. (ibid., 6).

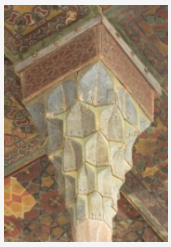
Important structures from the Parthian era include a building found in the village of Khore near Arak, which some researchers attribute to the Seleucid era, but the research of the late Ali Hakimi shows that the baronial mansion belongs to the Parthian era and is influenced by Greek art (Hakemi, 1990, Rahbar, 2003, Bani Jamali et al., 2020). Subsequently, in later eras, such as the Sasanian era, Ornate and elaborately decorated columns are not seen; rather, the columns only serve a load-bearing function and are mostly devoid of capitals. For example, the columns in the Sarvestan Palace

represent this period. However, with the advent of Islam in Iran, the use of columns in architectural buildings gradually expanded. During the Ilkhanid and Timurid periods, the element of the column was made of stone with elaborate muqarnas capitals, and multi-faceted and round column bases with wooden beam ceilings were used in the mosques of Azerbaijan by architects. During the Safavid era, there was a shift from stone columns with muqarnas to wooden columns in mosques. The use of wooden columns reached its peak during this era in the Azerbaijan region, and subsequently, wooden columns and capitals influenced the architecture of Safavid palaces and some Qajar era buildings, especially bathhouses and mosques (Khanali et al., 2019). Table 1 introduces a few examples of these architectural elements.

Table 1. Introduction to Iranian columns and capitals. Source: Authors.

Era	Columns and capitals	
	Fig.	Description
Median		Gurdakhmeh Rock: a rock formation with simple round columns that is attributed to the construction of the father of Diako king of the Medes, in the Cultural Heritage Archive of West Azerbaijan Province.
Achaemenid		Takht-e Jamshid (Persepolis): Circular stone columns with capital tops shaped like animal forms and rented out in the likeness of a bull.
Parthian		The ancient ruins of Khoreh House: a lordly mansion from the Arsacid period with capital tops resembling the Doric columns of the Seleucid-Arsacid period (National Register File), likely influenced by Greek art (source image: pinterest.com).
Sasanian		Sarvestan Palace: Circular stone columns without capital tops.
Islamic Golden Age		The historical mosque of Damghan with octagonal stone columns, appears that during this period, the capital tops did not have a place due to the simplicity of mosques..

Rest of Table 1.

Era	Columns and capitals	
	Fig.	Description
Seljuk		The Jame Mosque of Abiyaneh: Wooden polygonal columns with carved capital tops.
Ilkhanate		The Jame Mosque of Isfahan: Circular stone columns without capital tops.
Safavid		The Ali Qapu Palace: Wooden polygonal columns with carved capital tops.
Zand		The Vakil Mosque: Stone column with carved stone capital tops with floral patterns
Qajar		The Golestan Palace: Circular stone columns with carved stone capital tops with geometric patterns

• Examination of Capitals

In order to thoroughly examine the capitals, it is essential to analyze the constituent elements of them. Conducting a comprehensive study of the column and capital samples executed in Iran from the Achaemenid period to the Qajar period can provide insights into their characteristics in the context of the overall form of the capitals, which demonstrates the relationship between the column and the structural element. Furthermore, the materials from which the columns and capitals are composed, and the general geometry of the capitals are adaptable and crucial factors to be analyzed (Table 2).

• Structure of Capitals

As mentioned earlier in the theoretical foundations section, columns are generally divided into three parts: the base, the shaft, and the capital (Kermani, Sereshki, Rafiee Zadeh, 1383). In the capital section of columns, Various forms are observed, including capitals, cushions, and sometimes both simultaneously used together (Fig. 1), mainly in wooden structures from the Safavid period onwards. On the contrary, some columns are also devoid of capitals or cushions.

Sample Studies: Wooden Mosque Capitals in Azerbaijan

After a comprehensive review and introduction of Iranian columns and capitals in different periods, the focus has shifted to the wooden mosque capitals in Azerbaijan, highlighting the most prominent existing examples (Table 3). Generally, Azerbaijani architecture features characteristics such as wooden columned halls, flat wooden ceilings, hidden chambers, and the like (Pirnia, 1993, 47). In columned Azerbaijani architecture, the use of wooden ceilings and platforms, as well as the absence of load-bearing and space-dividing walls, necessitates the use of wooden columns. These columns usually serve two fundamental purposes; firstly, a structural aspect involving bearing the weight of the ceiling and directing it to the ground, and secondly, decoration and ornamentation (Madhoushian & Shishvani, 2017, 22). Columned mosques in Azerbaijan are predominantly adorned with muqarnas decorative forms. Muqarnas, due to its geometric complexity, is well-recognized. These designs are based on a system of projecting layers where successive layers of stone or other materials gradually recede backward, forming stalactite-like shapes. This not only creates

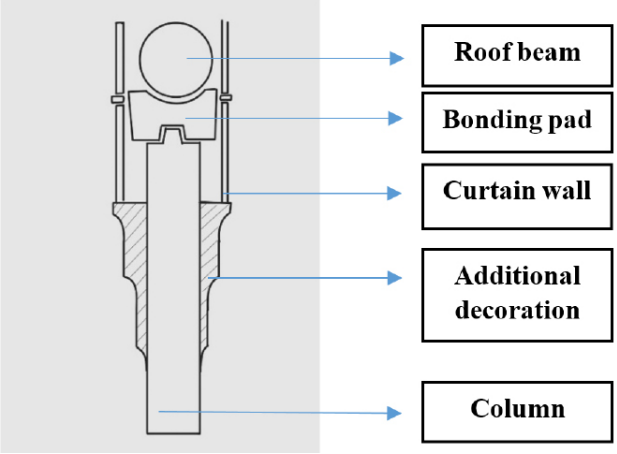
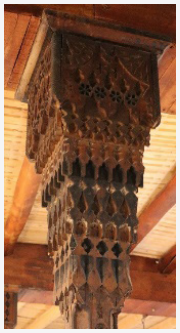
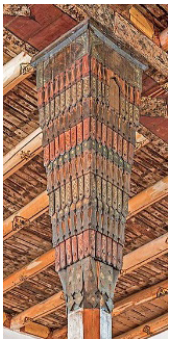
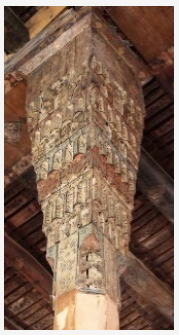
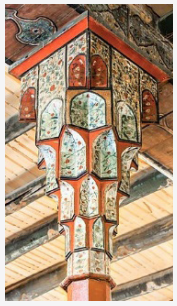


Fig. 1. Technical drawing of column and capital. Source: Authors.

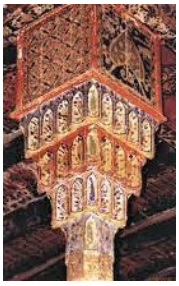
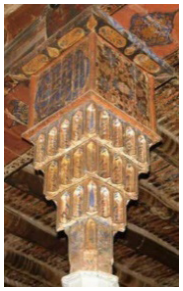
Table 2. Summary of analysis of form, materials, geometry, and technique in Iranian columns and capitals. Source: Authors.

Components		Features
Form	Column	In various periods, columns have been variable and generally shaped as circular or polygonal.
	Capital	The use of animal capitals in the Achaemenid period and in subsequent periods, either lacks capitals or are adorned with floral and geometric forms.
Materials		In general, stone, brick, and wood were mostly used in the construction of columns and capitals.
Geometry	Column	Columns are primarily shaped in circular, square, or polygonal sections.
	Capital	They include geometric capitals, mainly in the form of an octagonal Shamsa on a square background.
Construction Technique		Stone columns and capitals are typically carved, brick examples are in brickwork, and wooden examples are assembled from wooden pieces.

Table 1. Introduction to Iranian columns and capitals. Source: Authors.

City	Fig.	Mosque	Description
Bonab		The Kabud(blue) Mosque of Bonab	Adorned with prominent and recessed geometric patterns based on a quadrilateral geometry, made of wood, the Safavid era.
		The Jameh Mosque of Meydan	
		The Jameh Mosque of Mehrabad	Adorned with muqarnas-style geometric patterns based on a quadrilateral geometry, made of wood, Safavid era.
		The Jameh Mosque of Zavareh	
		The Mosque of Ismail Bey	

Rest of Table 3.

City	Fig.	Mosque	Description
Maragheh		The Mosque of Molla Mo'azz al-Din	Adorned with muqarnas-style geometric patterns based on an octagonal geometry, made of wood, approximately from the Safavid era.
		The Mosque of Malarstam	
Ajab Shir		The Mosque of Zirar	Adorned with recessed geometric patterns in the form of niches based on a quadrilateral geometry, made of wood, Safavid era.
		The Jameh Mosque of Shirli	
		The Qazi Mosque	

a visually stunning effect but also serves structural functions (Luqmonov & Jurayeva, 2023, 15). The geometrical arrangement of columns plays a significant role in the formal geometry of the base, shaft, and even the capital (Valibeig & Kourangi, 2018, 12). On the other hand, regional variations in muqarnas patterns display regional alterations and artistic interpretations. Various Islamic cultures have placed their unique seal on muqarnas decorations. Muqarnas transcends its architectural application to convey symbolic and cultural significance, often regarded as a manifestation of divine order in the world (Luqmonov & Jurayeva, 2023, 16).

Among the studied examples, based on the determined research components to be investigated in line with the differences and features obtained, three of them, namely Mehra'abad, Zavarq, and Kabud mosques, have been meticulously designed and modeled, then examined from the perspectives of form, geometry, and composition. In this study, the muqarnas present in these mosques are categorized and studied in terms of their diversity of forms and outward appearances.

• Mehrabad Mosque, Bonab

According to the marble inscription located at the eastern entrance of the mosque, the construction date of the mosque is in 951 AH (Islamic Hijri calendar) during the rule of Shah Tahmasp I. One of the notable features of this structure is its placement on a platform over 1.5 meters high and the presence of a 14-meter minaret. The overall design of the mosque resembles columned halls and its quadrilateral shape evokes the grandeur of the Achaemenid era. Wood was predominantly used in the construction of Mehrabad Mosque, and most of its decorations were intricately crafted on wood. The mosque boasts 36 wooden columns and capitals, some of which, due to their repetitive forms and appearances, can be categorized into eight distinct types, which will be further elaborated on (Fig. 2).

• Zavaragh Mosque

This mosque is from the Safavid period and its overall shape resembles the features of Meyrabad Mosque. However, no colors have been used on the wood in this mosque. It has 21 columns and capitals, which, due to the repetitive form and appearance of some capitals, can be divided into six categories, as detailed in the Fig. 3.

• Kabood Mosque, Bonab

From the inscription installed on the ceiling of the Shabestan, it is understood that in the year 1271 AH, during the reign of Nasser al-Din Shah, repairs were carried out. The text states: "The date of the mosque's repair in the reign of Khosrowdeen Nasser al-Din Khaladallah Malik and the supervision of Molana Hossein son of Molana Abul Qasim, the trustee of the neighborhood Haji Mohammad Taqi and Haji Ibrahim Khalil. Completed in the year 1271 AH by Haji Mohammad Khan. The name of the architect of the building is described below: Talib Sharieat Nabavi and Sallek Mostafavi, architect of Beit al-Ha (Sufi Farajallah), completed in 1271 AH." This mosque has 8 columns and capitals which, considering the repetitive form and appearance of some capitals, can be divided into four categories, as explained in Fig. 4.

Research Findings

• Form

The studied capitals of the mosques have been executed in various dimensions, forms, and visual shapes. While identifying the different elements of muqarnas in the prominence of the surface is easy, it seems difficult to understand which element belongs to which row. Muqarnas can be interpreted as basic blocks referred to as cells. Additionally, there are intermediate elements that are usually smaller and are needed between cells to complete the required geometric pattern. All muqarnas elements are recognized as three-dimensional structures (Maskin, 2019, 12). Based on the conducted reviews, the capitals of these mosques can generally be divided into four categories from a formal perspective.

In the first category, each of the *Ghatarbandi*[4] capitals consists of tasa, arches, prominences, and recesses placed on top of each other in a corbel form in a

Fig. 2. Introduction of columns of Mehrabad Masque in Bonab; Pieces shaped as symmetrical pillars have been cut and instruments have been placed on top of each other. Source: Authors.

way that echoes the muqarnas form from a distance. Various types of muqarnas components, including "Tasa", "Shaparak", And "Takht" (flat form), were used in constructing these structures. These structures also witness the connection of tasa by shaparak in stacked Ghatar[5] (row) where mostly recessed and multi-angled flat forms are used. The second category includes capitals consisting of recessed Tasa and

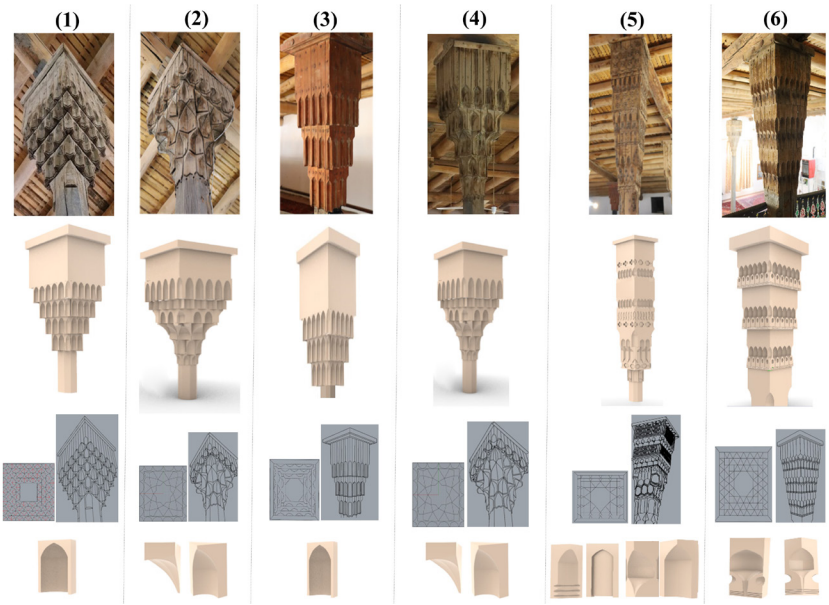


Fig. 3. Features of columns od Zavaragh Masque in Bonab; Pieces shaped as symmetrical pillars have been cut and instruments have been placed on top of each other. Source: Authors.

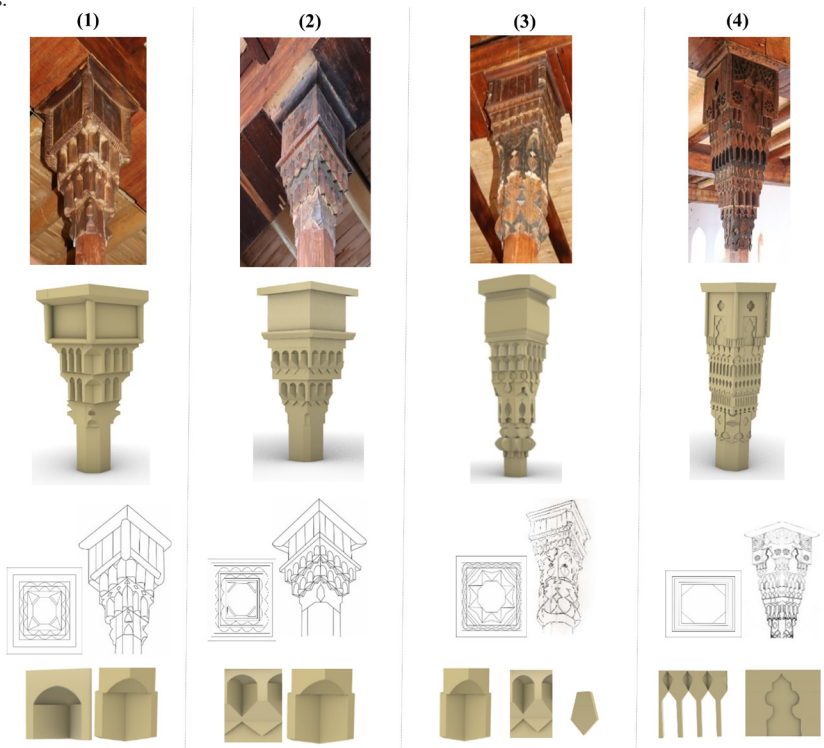


Fig. 4. Feature of columns of Kabud Masque in Bonab; Pieces shaped as symmetrical pillars have been cut and instruments have been placed on top of each other. Source: Authors.

horseshoe shapes, with some structures also utilizing flat forms. In the third category, similar to the second category, the arrangement of Tasa in each row is often regular and alternating, and the stacking of rows on top of each other is in a step-like manner. This type of Tasa coexistence in row formations led to the elimination of the Shaparak component seen in muqarnas, mainly observing the three-pointed flat component instead. In the fourth category, we observe capitals with composite forms of muqarnas and geometric textures, using floral and polygonal geometric forms and lacking any Tasa and Shaparak, solely consisting of regular geometric recesses and prominences arranged incrementally on regular rows (Table 4).

Table 4. A Comparison of Different Types of Capitals on a Uniform Scale. Source: Authors.

Type	First Type Capital	Second Type Capital	Third Type Capital	Fourth Type Capital
Fig.				
Description	Use of Curved Tasa , Horseshoes , Shaparak, and three-pronged Takht.	Banded Capital with Horseshoes arches and No Shaparak.	Banded Capital using Horseshoes arches, with Flat three-pronged and Shaparak.	Composite Capital with Geometric Texture and Ghatarbandi.

• Composition

The capitals of the Mehraabad, Zavaragh, and Kabood mosques include muqarnas and geometric structures. Muqarnas essentially consists of rhythmic repetitive modules (Maskin, 2019, 9). Muqarnas are referred to as geometric knots (knots drawn upwards) due to their shape and appearance, where the knot is based on a strict rule, and artists cannot change the stars and other geometric shapes that make up its distribution (Luqmonov & Jurayeva, 2023, 13). The geometric analysis of muqarnas requires breaking it down into its constituent elements (Necipoglu, 2000, 408). Therefore, for a detailed examination of the geometry of the structures under study, it is necessary to dissect them layer by layer and investigate them in detail. The basic model of the muqarnas pattern includes three primary elements such as similarity, repetition, and scale variation. The small sizes of the elements create intricate geometric compositions (Maskin, 2019, 12). Based on the conducted research, it can be claimed that artisans only need two-dimensional designs of muqarnas to create muqarnas. Different types of muqarnas consist of layers (Takht or flat) that place a radial system around the Shamsa. To connect the layers, masters used various types of Toranj, Tasa, and Shaparak that fill the empty spaces (Mustafoev, 2021, 114). Decorated capitals with muqarnas decorations consist of Ghatar or regular rows[6] and range from one to ten variable rows that are stacked on top of each other, all executed on a square or Shamsa background. The composition varies in different structures, where in some, all rows are placed on the square background (Fig. 5), and in others, the first row starts from an octagonal Shamsa and finishes on a square in the last layer (Fig. 6). The second type of capitals combines geometric decorations and muqarnas rows, they do not adhere to a specific geometry but simply exhibit regular repetition of a geometric pattern consisting of depressed and raised forms.

• Components

Among the components used in designing the muqarnas

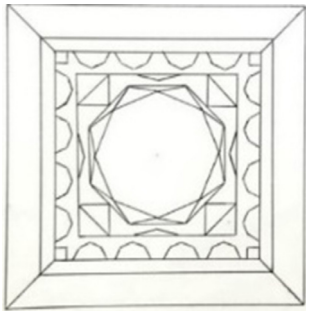


Fig. 5. Composition of Capital Structure in Alternating Layers on a Square Background. Source: Authors.

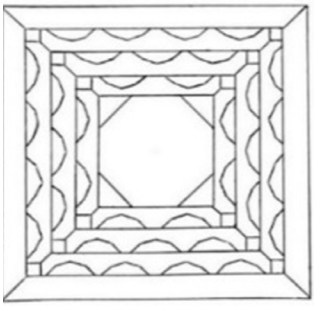


Fig. 6. Composition of Capital Structure consisting of octagonal and Shamsa Layers Terminating into a Square Background. Source: Authors.

of these mosques, we can mention the concave muqarnas, such as the Tasa, Shaparak, Takht, and three-pronged elements, which have had the most applications in the composition of the muqarnas and have been arranged together in the square goblet and Shamsa background.

The muqarnas Components used in these capitals are of the concave muqarnas type. A concave muqarnas is similar to a simple muqarnas in which the ceiling of its cells is curved and between the ceiling of the cellular elements (Tasa)[7] similar to (Fig. 7) a concave muqarnas that stands on a square and a middle element placed on a collar (the square and the collar are the projections on the horizontal plane, hence the empty spaces, which are not visible on the geometric pattern) (Dold-Samplonius & Harmsen, 2005, 86). The muqarnas can also have floral, polygonal, or star-shaped elements (Garofalo, 2011, 387), which have been used in the geometric structure of the capitals as regular rows in the capitals (Fig. 8).

• Construction Technique

The capitals adorned with wooden decorations are generally formed by arranging various wooden pieces as vertical shafts placed next to each other (Fig. 9). In this manner, the pieces are cut into triangular shafts with different angles according to specific geometry and then stacked layer by layer on top of each other (Fig. 10).

For shaping the muqarnas elements, a cutting technique based on a specific and regular pattern is employed. In some cases, they are also carved using a chisel (Fig. 11). Based on these techniques, the evaluation results of these mosques are presented in Table 8. In this table, which assesses the capitals based on form, geometry, technique, and components, the similarity in construction techniques alongside distinctions in form, geometry, and sometimes components are highlighted.

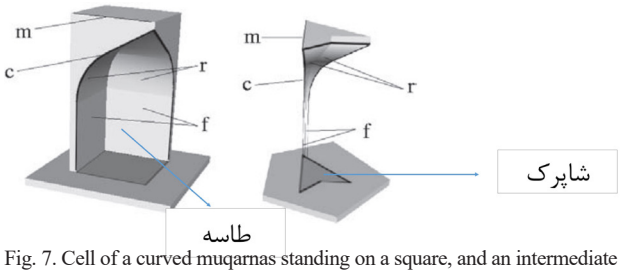


Fig. 7. Cell of a curved muqarnas standing on a square, and an intermediate element(Shaparak) standing on a biped. (The square and the biped are horizontal plane projections, hence empty spaces. Source: Authors based on Dold-Samplonius & Harmsen,2011,86.

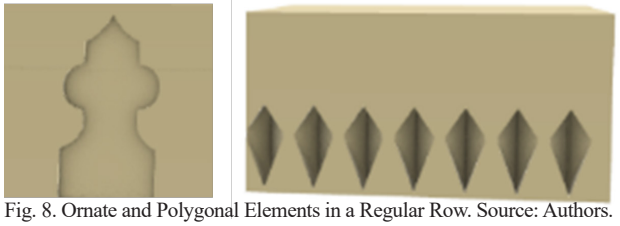


Fig. 8. Ornate and Polygonal Elements in a Regular Row. Source: Authors.

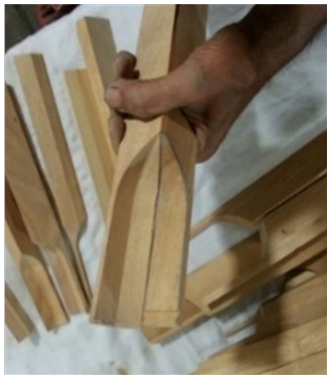


Fig. 9. Arrangement of Triangular Pieces Together. Photo: Sina Askari Hassanlouei, 2020.


Fig. 10. Layout of Capital Column Shafts.
Source: Sina Askari Hassanlouei, 2020.

Conclusion

The wooden columns of the mosques in East Azerbaijan, implemented in the form of mocarnas and developed and expanded, can have various reasons for their formation, such as the absence of load-bearing and dividing walls in the mosques, logical and cultural changes alongside spiritual and religious beliefs. These designs are based on a robust emerging system where consecutive layers of wood gradually emerge and form muqarnas-like shapes, various, and different designs can be observed in comparative analysis. In terms of form, a variety of shapes and forms have been used in designing and constructing the chosen mosque columns, in a way that

the number of columns in each mosque is repetitive from several different shapes. These forms are divided into four categories including columns with a diagonal arrangement using curved Tasa, columns with a diagonal arrangement using horseshoe arches, Shaparak, and three-pronged bases, columns with diagonal arrangement using horseshoe arches without Shaparak, columns with diagonal arrangement using horseshoe arches with three-pronged bases, and finally composite columns with geometric structure and muqarnas arrangement. These columns consist of regularly repeated Tasa in multiple and regular rows, and the number of arrangements in different columns varies from one to ten. The composite columns are a combination of muqarnas form and broken, protruding, and curved shapes. This diversity

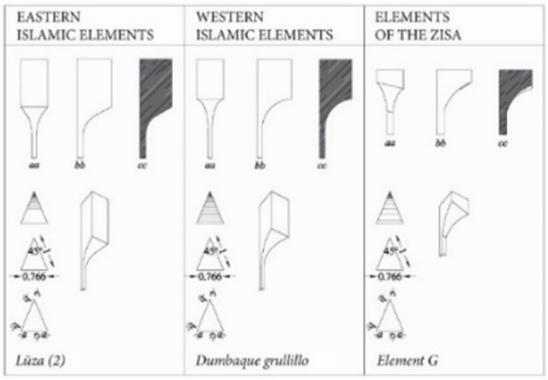
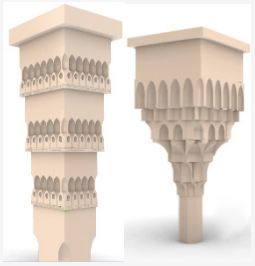
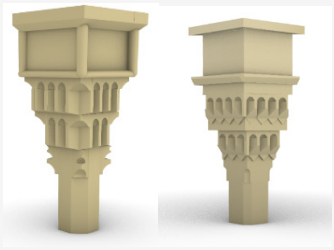
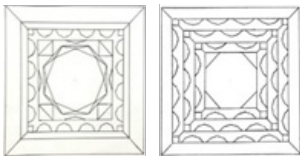
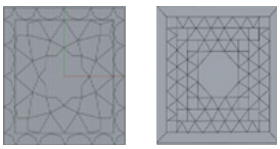
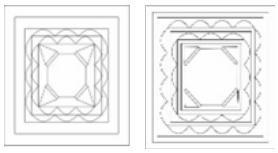
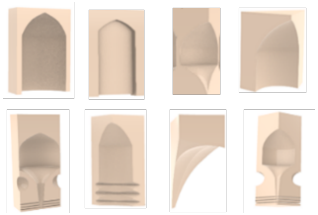
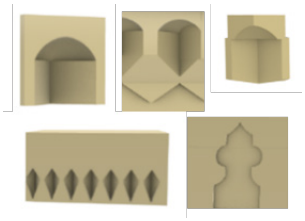


Fig. 11. Illustration and Angles of Components Forming the Capital. Source: Garofalo, 2011, 368.

Table 5. Summary of form, geometry and technique elements in capitals. Source: Authors.

	Examined Elements		
Mosques	**Mehrabad**	**Zavaragh**	**Kabud**
Form			
Horizontal Section	 All capitals are designed on a square billet background, and in some of them, a Shamsa plan is also used.	 All capitals are designed on a square billet background, and in some of .them, a Shamsa plan is also used	 All capitals are adorned on a square billet background and lack a Shamsa plan.
Technique	The pieces are cut into triangular shafts, and the components are stacked on top of each other.	The pieces are cut into triangular shafts, and the components are stacked on top of each other.	The pieces are cut into triangular shafts, and the components are stacked on top of each other.
Components			

is not limited to column forms only, and it can also be observed in the geometry and composition of their various components. Overall, all the examined columns are terminated by an octagonal column surrounded by multiple layers in a square background; however, their compositions are not the same and are divided into two types of arrangements on a square background and arrangements on a square background with Shamsa. It is worth mentioning that among the examined mosques, the Kabud Mosque in Bonab lacked a composition with a plan of Shamsa and the components used in the examined columns generally include Tasa, arches, and in some cases include the shape of the three-pronged base. Moreover, in the geometric structure of the columns, elements with unfamiliar and diverse geometric and floral shapes have been used.

However, what can be considered the same in all the examined columns is their construction technique and shaping, where multiple pieces with triangular cross-sections are placed next to each other to form a vertical column, and cutting and carving techniques have been used in shaping them.

Conflict of Interest

The authors declare that there was no conflict for them in conducting this research.

Endnotes

1. Shabestan refers to the covered enclosed space, and in the mosque prayer halls, they also referred to the covered section as Shabestan, which was typically used in winter (Rafiezadeh et al. 2004).
2. Ali Akbar Dehkhoda: A chihil sutun space with numerous columns, even if it does not have precisely forty columns (Dehkhoda, 1988).
3. Setavand, is a portico open on one side and has several columns. A forty-columned structure that only has a wall on one side, with a magnificent example seen in the Apadana of Persepolis (Rafiezadeh et al., 2004).
4. Qatarbandi is also known as "Mukranas" (Lorzadeh et al., 1995, 85).
5. The emergence of prominent protruding and projecting ornaments under which carvings are intricately done is referred to as "Qatar" (Kheyri, 2006, 748).
6. Adjacent cells whose bases are parallel to the horizon are called a row (Dold-Samplonius & Harmsen, 2005, 85).
7. An instrument that is placed between two Shapaak or between two Toranj and creates recessed Muqarnas spaces (Lorzadeh, 86, 1995).

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