



## EXPLORING THE ARCHITECTURE AND ITS INFLUENCE OF BADSHAHI MOSQUE LAHORE (BMLH): A UNESCO TENTATIVE HERITAGE SITE

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### ABSTRACT

Asia has a variety of diverse ancient cultures and civilizations. In this paper, we studied the architecture of a UNESCO tentative heritage site: Badshahi Mosque Lahore (BMLH, 1671–1673), built by the Mughal emperor Aurangzeb Alamgir (AA). The site is special since it had the largest mosque title (human capacity = 100,000) in the world from 1673 to 1986, has great architectural importance, and is one of the most popular tourist attractions in the world. Various mosque architectures (MA) emerged over the past 1400 years worldwide to preserve each region's diversity, identity, and culture. A documentation visit was arranged to study this site and feel the real architecture of the Mughals after decades of preserved form. The study found that BMLH underwent significant alterations while keeping the original MA. This unique study further focused on the basic architecture of the Mughal Era. A detailed study of the architectural themes of BMLH showed that the architectural style of this heritage included regional, cultural, and traditional impacts. By analyzing the architectural themes and distinctive features of BMLH, we have uncovered the distinct regional, religious, and psychological influences that led to Mughal-era mosque architecture's development. Further documentation was reported about the current structural situation of Badshahi Mosque; the number of seepages has been pointed out, and several decays were sighted during our visit. For this significant site's perfect preservation, it was proposed that high-end preservation strategies be implemented in the future.

**KEYWORDS:** UNESCO tentative heritage site; Badshahi mosque; Mosque architecture; Regional architecture; Mughal architecture

### INTRODUCTION

Humanity has a history of religions and building worship places to comfort the soul with divine connection [1]. One of the divine religions is Islam, followed by Muslims, which emphasizes harmony, hygiene, charity, justice, education, harmony, equality, and understanding between nature and humans [2]. Therefore, Muslims built mosques to pray inside specified building spaces called mosques. Besides praying, the mosques have been very useful in showering for better hygiene, providing food and charity, solving social problems through peaceful negotiation, and spreading education at a massive level [3]. Because a peaceful human inside a safe, comfortable worship place is more capable of thinking, negotiating, and solving problems related to society due to mutual respect, all these activities require mosque architecture (MA) that can fulfill the demands of safety, a big place for a group or separate entrance and exit, cleaning for safe hygiene, prayer, a meeting place to socialize, a clear voice transfer system, and education for all.

This manuscript relates the architectural influence of a South Asian Mughal emperor, Aurangzeb Alamgir (AA), on the United Nations Educational, Scientific and Cultural Organization (UNESCO) heritage tentative site, i.e., Badshahi Mosque Lahore (BMLH) as a case. The Mughals adopted some elements, decorations, and ornaments from the regional and old mosque architecture (MA) to create a prominent theme. The UNESCO Tentative Heritage: Badshahi Mosque Lahore (BMLH, 1671-1673) was built by the Mughal emperor Aurangzeb Alamgir (AA). The site is special since this had the largest mosque title (human capacity (HC) = 100,000) in the world from 1673 to 1986, with great architectural importance. This research is focused on (1) the Basic architecture of the Mughals and (2) A detailed study of the architectural themes (ATs) of the BMLH and the inspirations of Mughal architecture in the BMLH [4].

The six classic typologies of mosques that make up Islamic architecture are well-known worldwide. Mosques in Southeast Asia are classified into several varieties based on the local culture, including Arabic, Turkish, Iranian, Indian, Chinese, and South East Asian

forms [5]. The study aims to explain the Mughal architecture in Pakistan by taking Badshahi mosque as a Mughal contribution and tracing it back to the influence of its architectural style, which held over Mughal architecture due to its regional, religious, and psychological inspirations.

In the past, a lot of study has been done on the architecture of mosques in many different cultures and civilizations. Studies have looked at how mosque designs help preserve diversity, identity, and cultural history. But not much focus has been paid to how Mughal architecture affected the building of mosques in the Pakistan region. Adding to what we already know about Islamic architectural types, this study helps us learn more about the unique features and effects of Mughal-era mosques, with a special focus on BMLH [6, 7].

This study takes an innovative approach by investigating BMLH's architecture from many angles, including its regional, religious, and psychological influences. Also, this research uses a literature survey and a field study to gather a wide range of information, such as historical records, architectural analysis, and first-hand views of the mosque. With this multidisciplinary method, the themes and influences of BMLH architecture can be studied in depth, and new insights into the Mughal architectural legacy in the area can be found. This study shows what the Badshahi Mosque in Lahore means in terms of design and where it fits in with the wider context of Mughal architecture.

Moreover, this study has shed light on the site's current condition, its smooth and slow decay, and the replacement of irrelevant textures in the facade during previous conservation. Some suggestions were also added in this paper's last paragraphs for better preservation.

## METHODS

The methodology of this research study is primarily based on an empirical survey. Consequently, the research method depends upon qualitative data through observation and physical documentation of the Badshahi mosque. The research progresses according to the following sequential stages.

### LITERATURE SURVEY

- To investigate a contextual analysis of the area, particularly Lahore city during the Mughal Era.
- To look into and comprehend the Mughal Era mosque building's attributes, identifying elements, and design.
- To comprehend the architectural and historical importance of the chosen Badshahi mosque, a magnificent Mughal building.

### FIELD STUDY

- To observe the present conditions of the specific historical Mughal Mosque through a field survey and photographic survey.
- Collect data, architectural details, and other important information about the Badshahi

mosque.

- To feel the materials used in the Badshahi mosque through touching and observation with the naked eye for better analysis.
- Observe the geometry and decoration theme used in the prayer hall's interior and the building's front façade.
- To critically analyze the design theme of each part of the building and track it back to its inspiration concerning the other architecture world.

### EXPLORING ACTIVITY

- To identify the tangible distinguishing features of an outstanding historical Mughal Mosque named Badshahi Mosque.
- To accomplish the findings, relate those distinguishing features with the characteristics of the Mughal Mosque based on morphological character, architectural features, structure, and decoration.
- We verbally ask the tourist about the design elements that attract them to the building.
- Feeling and realizing the Mughal's psychology of design through Badshahi mosque (Site survey plan of Badshahi mosque, (Figure 1) and the other contextual buildings of the Mughal Era.

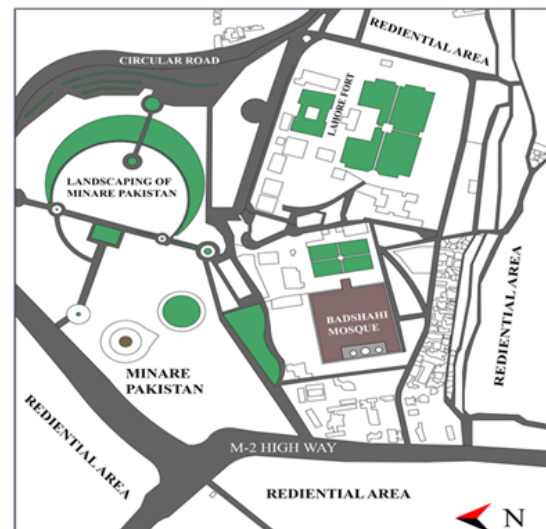


Figure 1. Site survey plan of Badshahi mosque.

Source: drawn by the author.

## RESULTS AND DISCUSSION

### MUGHAL ARCHITECTURE

The Mughal Empire was one of the centralized governments that combined MAs of Jews (i.e., Al-Aqsa: Jerusalem, Israel), Christians (Churches), Muslims, and Persian and Indian architectural styles to create Mughal architecture in Southeast Asia. Mughal architects, through planning, enhanced the intellectual contact between Persian and European ideas. This period is renowned for the nation's most stunning free

-standing massive holy structures.

The primary features of a Mughal mosque (MM: BMLH) are its enormous, meticulously well-planned structures. These include a wide courtyard and a sanctuary, or Pishtagh, symbolized by a vertically expanded bulbous dome. The Chhatris (domed-shaped pavilion) and decorative minarets, and moreover, the enormous functioning minarets on the opposite side of the courtyard's cloisters and ivans (Lawns), further accentuate the vertical focus [8].

Mughal architecture, regarded as a highly harmonious and beautiful combination of different architectures, is notable for reflecting and fusing different cultures. Many historical researchers have acknowledged and praised the exceptionally elegant Mughal signs, decorations, and beautifications, including the queen and princess of England [9].

**BADSHAHI MOSQUE**

The Mughal Emperor Aurangzeb Alamgir (AA) built the BMLH (Figure 2) in Pakistan (1671-1673), nearby (Northwest corner) the magnificent Lahore Fort that served as safety, easier management of government affairs such as education, pleasant surroundings, and access to justice for the common public. Mr. Fidai Khan Koka (brother of AA) was responsible for the construction affairs of the BMLH (Figure 3) [6].

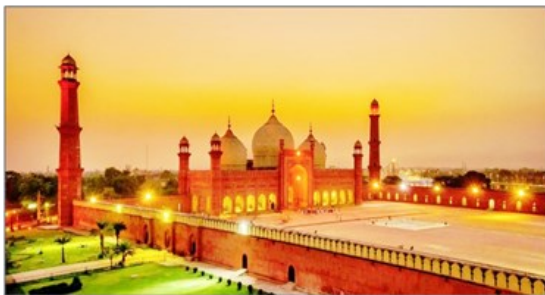


Figure 2. Isometric view of Badshahi mosque. Source: <https://adillahorei.com>.

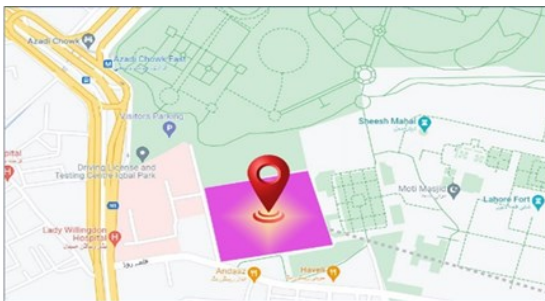


Figure 3. Bird-eye view of Badshahi mosque through Google Earth maps—source: Google Maps (edited by author).

**THE IMPORTANCE OF BADSHAHI MOSQUE AS A UNESCO TENTATIVE CULTURAL HERITAGE SITE**

The World Heritage Convention, founded by UNESCO in 1972, defines World Heritage Sites as locations important to cultural or natural heritage [10]. Landmarks, collections of structures, and places make up cultural heritage, including architectural achievements, massive sculptures, and inscriptions (including archaeological sites). Nature heritage comprises natural and physical formations, geophysical and physiographic structures, habitats of endangered animal and plant species, and natural areas that are significant from the perspectives of research, conservation, or natural beauty [11].

Table 1 reveals that Pakistan currently has six UNESCO World Heritage Sites and that there will be another 26 by 2023 or later. These sites include the Buddhist Ruins of Takht-i-Bahi and Adjacent city remains at Sahr-i-Bahlol, the Archaeological Ruins at Mohenjo-Daro, and Taxila, the first three sites to be classified in 1980. The Rohtas Fort was the most recent structure added to the list in 1997, after two sites were added in 1981. Six places are all cultural [12]. The presence of BMLH as a Tentative site on the World Heritage List shows that it is a highly architectural, cultural, and historically significant site built by the

Table 1. Six world heritage sites in Pakistan. Source: designed by the author.

Name of Site	Location	Year of Enlistment	Area of Interest by UNESCO
Mohenjo-Daro's archaeological ruins	Sindh province	1980	Cultural Site
Ruins of Taxila	Taxila City, Punjab Province	1980	Cultural Site
At Sahr-i-Bahlol, there are Buddhist ruins from Takht-i-Bahi	Takht-i-Bahi, Khyber Pakhtunkhwa	1980	Cultural Site
Historical Monument of Makli	That Sindh province	1981	Cultural Site
Shalimar gardens & fort	Lahore, Punjab province	1981	Cultural Site
Fort of Rohtas	Near Jhelum, Punjab province	1997	Cultural Site

Mughals [13].

**ARCHITECTURE OF BADSHAHI MOSQUE**

Due to its location as a gateway to the West and, in particular, Persia, Lahore developed a strong regional style that Persian and some regional architectural influences heavily influenced. Even though Aurangzeb constructed the Badshahi mosque on a far larger scale than Shah Jahan, he nonetheless adopted an architectural style similar to the one Shah Jahan chose for the Jama Masjid in Delhi. Both mosques have red sandstone with white marble inlay, contrasting with the typical mosque design in Lahore,

which has superb tile work as decoration. Figure 4 shows us the visual plan of the Badshahi mosque.

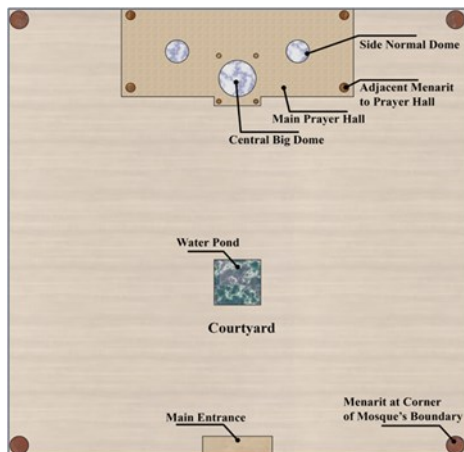


Figure 4. Architecture plan of spaces of Badshahi mosque.  
Source: drawn by the author.

Mughal architecture is famous for its large courtyards. In Badshahi mosque, we can observe the same thing: its structure is heavy, and the main building occupies very little space. But on the other hand, it has a very long courtyard surrounded by decorated walls. Minarets have been placed at all the corners of the Badshahi mosque to create a balanced proportion. Here below, the measurements of the Badshahi mosque are explained in Table 2.

#### COURTYARD

Visitors enter a vast courtyard with a 276,000 square foot red sandstone floor that can accommodate 100,000 worshippers when used as an Idgah after passing the large gate. Arcades on one axis surround the courtyard. Small kiln-burnt bricks placed in the Mussalah (Row) pattern had been used to lay the courtyard's original floor. The red sandstone

Table 2. Physical measurements of Badshahi mosque. Source: Table designed by author.

Name of Area	Measurements	Area in sqft	Details of Space / Element
The courtyard	528'-8" x 528'-4"	278,784 sqft	A division into two levels, upper and lower. Funeral rites include also performed in the latter
Prayer Hall	275'-8" x 83'-7" x 50'-6" (Internal height)	22,825 sqft	Its main vault is 37'-3" wide by 59'-4" tall, although the meplons are 74'-6"
Minarets at Corners	67' in circumference, 176'-4" high		The height is divided into four parts and has a 204-step enclosed staircase
Centralized Dome	At bottom diameter is 65' (at bulging diameter 70'-6"); height 49'; pinnacle 24' and neck 15' height		
Small Domes at each side of Central Dome	At bottom diameter is 51'-6" (at bulging diameter 54'-2"); height 32' while pinnacle is 19'; neck 9'-6" heighted		
Main Gateway	66'-7" x 62'-10" x 65', vault 21'-6" x 32'-6" elevation		It is approached by 22 steps
Aisles at Side (Dahlan)	Elevation above floor 23'-9"; plinth 2'-7"		Total 80 in number
Central water Tank	50' x 50' x 3' depth	2,500 sqft	

flooring was installed between 1939 and 1960 during significant restorations.

#### DOMES

Al-Aqsa mosque (Israel), temples, and churches all over the world served as inspiration for adding domes to the mosque's structure in order to facilitate clear and effective sound propagation for the audiences through the principles of sound wave transportation and sound reflection physics. Since the Umayyad period (691 AD) and for the following centuries, the dome has been regarded as one of the most significant MA elements [14]. The three crowning bulbous domes in BMLH-AA at the top of the rear chamber of the prayer hall were regarded as the mosque's most striking characteristics. The center dome is bigger and taller than the right and left domes. The domes featured shining pinnacles that could be seen clearly from a distance. They were constructed

elegantly and methodically on a squinch system coated in marble layers. On top of them, golden finials were placed to shine on sunny days and increase visibility from a long distance. In actuality, the domes were made up of separate masonry inner and outer shells separated from one another by voids 30 by 322 and 394 by 431 feet, respectively (Figure 5).

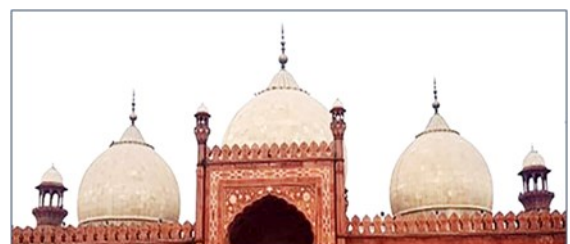


Figure 5. Capturing domes of Badshahi mosque, Lahore, Pakistan.  
Source: captured by the author.

They used the term "double domes." This structural modification was required since there was a tendency to make domes taller and to allow for easier form expansion, giving the domes a loftier and more regal aspect. By directing and conveying the sound of the sermon emanating from the Mihrab (niche) beneath the central dome in such a way as to avoid an echo, this invention of the double dome also aided acoustics. But without a doubt, the apex of this mosque's elevation of the prayer room lay in the bulbous form and volume of these domes, which were supported by tall drums of 21 and 32 feet, respectively, in height [15].

#### MINARET

There are octagonal, three-story red sandstone minarets with an inner diameter of eight and a half feet that are 196 feet (60 m) tall and have an outward circumference of 67 feet in each of the mosque's four corners. A marble canopy adorns the top of each minaret. Four additional, lesser minarets are located at the mosque's four corners of the main structure. In Figure 6, If we observe the minaret, each story has different heights and thus deserves stars for its beauty due to its perfect proportion.



Figure 6. Capturing minaret of Badshahi mosque. Source: captured by the author.

#### ENTRYWAY OF THE COMPLEX

The mosque complex's entryway is a two-story tower composed of red sandstone with exquisitely framed and carved paneling on each facade. The mosque's entrance, which faces east, has a view of the Alamgiri gate of the Lahore Fort, which Aurangzeb also built. It is a well-visualized view to explain the entry and its steps (Figure 7). We can see that the mosque's main gate features a sizable doorway set on a plinth and accessible through a flight of 22 steps. The construction of a grand gateway on the north side was prohibited since the mosque's north perimeter wall was constructed near the Ravi River bank. No imposing gate could also be constructed on the south side to maintain the gate's symmetry [16].



Figure 7. Entrance view of Badshahi mosque. Source: captured by the author.

#### PRAYER HALL

The main structure of the prayer hall is similarly made of red sandstone and has white marble inlay as decoration. Five niches, each roughly one-third the size of the central niche, surround an arched niche in the center of the prayer chamber. When we design a building for ceremonies, we focus on the clear height of the building, which is elevated more than normal buildings. Thus, the Mughals have mostly promoted the same concept in construction. The clear internal height of the prayer hall is 50'-6", which makes it a comfortable zone with a good ventilation system and environment for meditation. Religious instruction took place in the apartments of the chambers on each side of the main chamber. The mosque's prayer hall has enough space for 10,000 worshippers. Originally, Figure 8 explains that the prayer chamber's floor was lined with marble and Sang-i-Abri and constructed from cut and prepared bricks. After the most recent renovations, a marble Mussalah has been installed in their stead. The ceilings of the prayer hall are adorned with 'Mughal Floral Frescoes,' which add a spark of beauty to the space. Verses from the Quran are etched on the walls of the prayer hall. The hall's multi-foiled arches and massive pillars create seven distinct sections. The building's architect was tasked with reflecting the confidence and grandeur of the structure's namesake, Emperor Aurangzeb.



Figure 8. Flooring and interior of Prayer Hall at Badshahi mosque. Source: captured by the author.

## SURFACE AND SPACE

Islamic architecture uses decorations beyond just covering surfaces to help change interiors. Throughout history, this idea of ornamentation has been viewed as being adaptable. It is unconstrained by scale, substance, or form and continues to have infinite uses. The main goal of ornamentation in the architecture of Badshahi is to cultivate a fundamental surface propensity toward flexibility since this aids in easing transitions from one space to another. Sharp divisions are not permitted. In Figure 9 (a, b), different spaces have the same decoration theme inside the building.

Moreover, observe that its ornamentation articulates the surface that eventually defines a space, forming a strong relationship between space and decoration [17]. A variety of lavish embellishments conceals the structural components. The structures of Badshahi mosque's distinctiveness and variation are accomplished through many combinations.

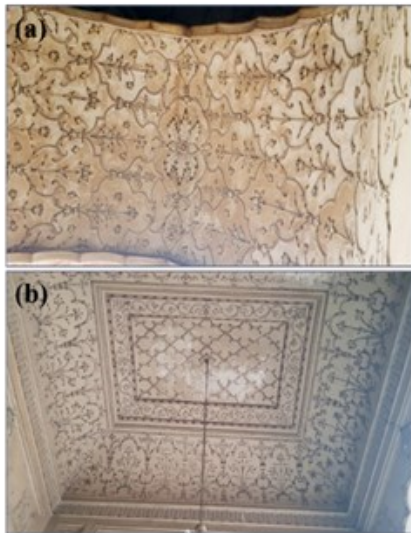


Figure 9. (a, b) Image showing decorated ceiling & Arch and ornamentation geometry at the prayer hall's interior arcade and principles of Mughal architecture in the exterior & interior elevation. Source: captured by the author

## GENERAL PRINCIPLES AND GEOMETRY

Patterning in both space and time is widespread. The capacity of the same designs to be reversed and changed frequently from one medium to another within the same structure. It may be further explained that each motif of design used in the architecture of the Badshahi mosque preserves its individuality within a comprehensive composition as a component of a general surface pattern that can be achieved by superimposing and counterposing that motif in various materials and patterns. Therefore, no pattern or design has been assigned more importance than another. Every element of its structure and interior is designed symmetrically, which describes Islam's basic concept regarding the equality of humans. The symmetrical recurrence of each pattern gives the design a limitless feel, with its recurring

decorating elements, the shape and structural components, and the volumes may be increased. In Figure 10 (a, b and c), it is clarified that repetition of shapes and geometry occurred in the architecture of the Badshahi mosque. This repetition has been managed so technically by Mughal artists that it catches the eyes of every visitor. Perfect proportion in this repetition has also played an important role [18].

Islamic art has refined geometric patterns to previously unheard-of levels of complexity and intricacy. These geometric patterns serve as an example of Islam's emphasis on symmetry, repetition, and the ongoing development of patterns. Islamic designers are known for their exquisite use of geometry and optical effects in their works of art. In the Badshahi mosque, these rules were utilized by the artists of that time. When negative and positive sections are balanced, there are flowing overlaps, underpass strapwork, and expert use of color and tone values. Islamic architecture utilizes geometric patterns to create a sense of connectedness between various architectural components [19].

During the Mughal Period, they played well with the geometry of Islamic architecture. They kept the proportions of every element in a specific ratio. Most of the structures of the Mughals, including Badshahi Mosque, follow the golden ratio. The articulation of Badshahi mosque has been arranged in such a geometric way that it looks balanced and attractive through the eyes of every normal viewer Figure 10 (d, e). Suppose we see the geometry of articulating the Dome interior (Figure 10 f). In that case, It is clarified that a very complex geometrical form is designed and then focused toward one point. It reflects the Rhythm of Islamic architecture, which focuses on unity and centralism.

Geometric patterns create considerably greater interrelationships than any other design when connecting outside and interior areas, the individual components, the entire building surface, and their furnishings. It can be observed very easily with the eye of a normal visitor that the facade of Badshahi mosque's building reflects its interior geometry [20].

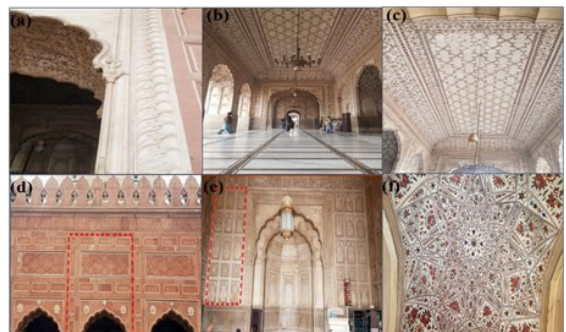


Figure 10. (a, b, c) The repetition of decoration, (d, e) Balanced geometry of shapes, (f) Geometry of Dome's articulation at Badshahi Mosque. Source: captured by the author.

### DECORATION OF BADSHAHI MOSQUE

Ornamentation is the main element that combines and unifies Islamic Mughal architecture and style. These have been the fundamental connections between structures and items for about thirteen centuries, from Spain to China and Indonesia. Islamic architecture and art focus more on decorations and themes than on shapes; these can be created using any method, regardless of scale, material, or method of expression. Figures 11 (a and b) are the best examples of Badshahi mosque to explain the method of expression in Islamic architecture [21].

There is never only one decorating style for a certain structure or item. Instead, pan-Islamic enrichment principles are appropriate for all objects and structures of all ages (regarding the link between art and architecture in Islam) [20]. In Badshahi mosque, we observed that multiple artistic themes had been used, but all were connected and showed harmony. Mostly, all the decorations are going in clay color. The patterns used have a special harmony among the outer and inner spaces.



Figure 11. Interior decoration, (b) Surface of walls decorated with paintings and Lotif. Source: captured by the author.

### FEATURE OF WATER

Islam uses water as a symbol of purification and elevates it to an almost sacred status. The water utilized in courtyard fountains and pools is a cooling medium and an aesthetic element in hot climates. The

visual axes are highlighted with water. It offers a range of ornamental motifs and reflects architecture. Water pools are fluid, active, immobile, unchangeable, and constantly renewing [22]. In almost every Mughal building, the Feature of water has been used, and thus we can see in Figure 12 that it is also used in the courtyard of Badshahi mosque for aesthetic purposes. A square-shaped water body has been created in the courtyard's center, with dimensions of 50'x50' and 3' deep.



Figure 12. View of the water pool in the center of the courtyard of Badshahi mosque. Source: captured by the author.

### MATERIALS USED IN THE CONSTRUCTION OF BADSHAHI MOSQUE

The main Prayer Hall's interior is lavishly decorated with artwork, embedded marble, and stucco tracery (Manbatkari). Beautiful ornate merlons with marble inlay designs adorn the skyline, lending elegance to the mosque's front. Small kiln-burnt bricks were used to construct the walls, which feature a red sandstone veneer on top of lime mortar and kankar (a type of hydraulic lime). Variegated marble is used for the plinth and steps leading to the prayer room.

The main prayer hall is quite deep and has seven compartments separated by richly etched arches supported by massive piers. Six of the seven compartments comprise curved domes with a central rib on the inside and a flat roof above, while the curve of three double marble domes is exceptional. The Eastern front aisle compartment's ceiling is level (qalamdani) with a curved demarcation line (ghalatan) at the cornice level [23].

The courtyard's original flooring comprised little kiln-burnt bricks arranged in a Mussalah (Row) pattern. The most recent substantial refurbishment was the installation of the existing red sandstone flooring (1939–1960). Similarly, during the most recent significant restorations, a marble Mussalah was installed to replace the main prayer room's original floor, constructed of cut and finished brickwork with marble and Sang-i-Abri lining [24].

The mosque's outer walls are ornately adorned and highly detailed, much like most remaining buildings. The walls are made of sculptured panels, and a tower with a turret and a dome is located at the corner of each wall. Sandstone constructs the turrets, while pricey white marble is used for the domes.

#### **INFLUENCE IN THE MUGHAL ARCHITECTURE (ANALYZING BADSHAHI MOSQUE'S ARCHITECTURE)**

The Badshahi mosque is a gift with distinctive Mughal Empire architectural features. In Figure 13, it can be seen clearly through the graphical representation of how the Mughals different factors inspired architecture and thus brought a new and gorgeous look to Badshahi mosque and other Mughal buildings during their reign.

The Jama Mosque in Delhi, India, and the Sheesh Mahal in Lahore Fort served as inspiration for it. The mosque's design is typical of the Mughal period, with a symmetrical layout, red sandstone and marble construction, and ornate embellishments, including calligraphy and geometric patterns. The entrance gateway, known as the Buland Darwaza (Heightened Gate), is a significant architectural element. The Badshahi Mosque exemplifies the magnificence and elegance of Mughal architecture on the Indian subcontinent.

In Badshahi mosque, we observed that the small domes over the entrance are traced back in inspiration to the stupa style (Pagoda) of Buddha, so this element in Mughal architecture was influenced by Buddha architecture style.

Moreover, according to Figure 13, Persian, Islamic, and Hindu architectural styles affected Mughal

architecture. The carvings and embellishments on the buildings show this influence. Hinduism frequently employs the idea of flowers in its architecture, including the minarets, which resemble flower stems. In contrast to the smooth curves of Persian arches, Mughal architecture has groves in its arches, directly borrowing from earlier Indian constructions. The arches in Badshahi mosque are an updated form of Persian and old Indian architecture [25].

Stone carving and marble inlay, particularly of loti-form figures in striking relief, are used to embellish the facade on red sandstone. Indian, Central Asian, and Indo-Greek architectural influences may be seen in the embellishment's technique and patterns.

When we talk about the height of the building of Badshahi mosque, it belongs directly to the nature and psychological behavior of the Mughal nation, who were famous for their dominancy and desire to show dominancy in their buildings. So, in the case of Badshahi mosque, it is reflected in the double-story heightened entrance. Also, the Mughals liked a prominent structure, so at the entrance, we see a plinth level of twenty-two steps dominating it. The expression of colors in Figure 14 has a psychological connection with each architectural style and thus represents it. So, it is clear that the Badshahi mosque is the best reflection of Mughal architecture. Its architectural influence is traced back to Islam, India, Persian, Buddhist, and other regions, explained through the graphical model in Figure 14.

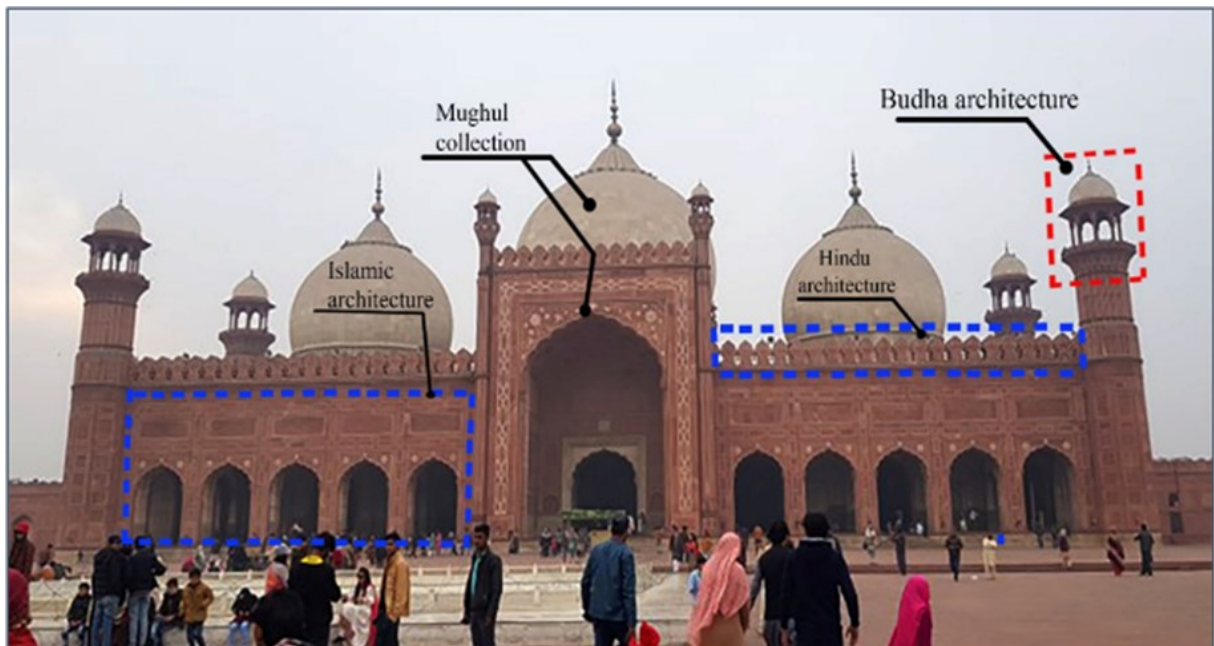


Figure 13 Representing the influence in the architecture of Badshahi mosque, Lahore, Pakistan. Source: captured by the author.



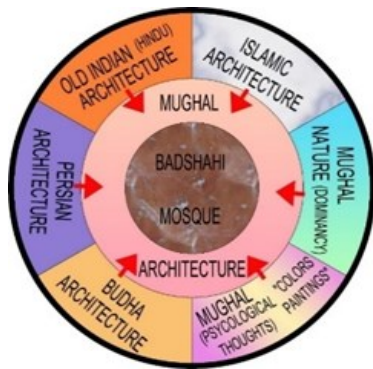


Figure 14. Circle of influence in Mughal architecture and application to Badshahi mosque. Source: designed by the author.

**PREVIOUS CONSERVATIONS HELD**

The earliest documented conservation work on the Badshahi Mosque occurred during the British colonial period in the first decades of the 20th century. Under the supervision of architect Sir Ganga Ram, structural issues were addressed, and the mosque's overall condition was maintained through restorations.

During the administration of Ayub Khan in the early 1960s, a significant conservation effort was launched to restore and preserve the Badshahi Mosque, which had suffered from dereliction and deterioration over time. Nayyar Ali Dada, an architect, led the conservation efforts with a focus on restoring the mosque's decorative and architectural features. It included the repair and restoration of the red sandstone facade, minarets, and marble crowns, as well as the cleaning, repair, and replacement, as necessary, of the intricate tilework and calligraphy to ensure their preservation.

In addition, the initiative aimed to improve the mosque's surroundings and accessibility. The courtyard was renovated, including the installation of appropriate paving and landscaping. In addition, a new ablution area was built, and the adjacent Hazuri Bagh garden was revitalized.

Throughout this conservation effort, the historical and cultural authenticity of the Badshahi Mosque was accorded the uttermost importance; traditional building methods and materials guaranteed the highest authenticity in the restoration work. The ultimate goal was to restore the mosque's original splendor and preserve it for future generations to appreciate.

**PRESENT STRUCTURAL CONDITION**

During the evaluation, there was evidence of leakage within the mosque's roof (Figure 15 a) and (Figure 17 a, b). The seepage has caused moisture and water damage in certain areas, threatening the mosque's structural integrity and appearance. While at Lawn, there is a poor drainage system; a lot of mud is accumulated at the rainwater drain, which causes blockage of water and further helps in the decay of unique Redstone at Lawn (Figure 15 b). This issue requires immediate attention to prevent further damage. It was discovered that dust had accumulated

inside the mosque, which could affect its aesthetic appeal and air quality (Figure 15 c). This issue necessitates immediate attention to preserve the mosque's cleanliness and integrity.

Some previous conservation efforts involved incorrect replacements that differed in color and appearance from the original materials (Figure 16 a, b and c) and (Figure 18 a). It has created a visual disparity and compromised the mosque's historical authenticity. The structure's architectural integrity was maintained, and the inappropriate replacements should be rectified.

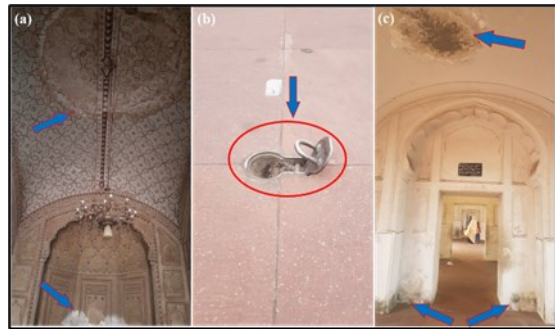


Figure 15. (a) Distortion of Roof seepage and on the wall below at Mihrab level, (b) Rain water drain hole at Lawn full with mud, (c) Accumulation of dust on inside walls. Source: captured by the author.



Figure 16. (a, b, c) All these images clearly show the installation of wrong replacements at Badshahi mosque. Source: captured by the author.

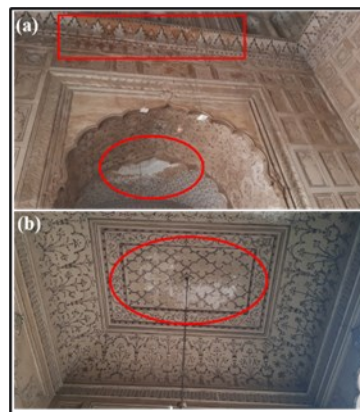


Figure 17. (a, b) Pointing out the seepage in the ceiling and façade design at the interior of Badshahi mosque. Source: captured by the author.



Figure 18. (a, b) Pointing out the incorrect installation of elements at the facade design of Badshahi mosque. Source: captured by the author.

#### PROSPECTS FOR THE FUTURE PROTECTION

The historical Badshahi Mosque can be preserved and protected by implementing several distinctive conservation techniques. Regular maintenance and cleaning should be carried out to prevent the accumulation of grime that could harm the building. Weather, earthquakes, and aging-related damage should all be structurally corrected. Environmentally friendly materials should be used for repairs. Frescoes, calligraphy, and tilework are ornamental elements that must be restored to preserve their historical and artistic significance. For example, foot traffic is controlled by removing shoes (Figure 19) and refraining from touching walls. Sometimes, when visitors come from faraway areas, especially the users of different factories, they may bring chemicals with their shoes, which may affect the building and its materials and start corrosion. Things are kept in their perfect state through systems for managing the climate. Education and awareness activities inform visitors of the mosque's significance. These recommendations can be implemented to maintain the historical and cultural importance of the Badshahi Mosque while conserving it.



Figure 19. Idea of walking with bare feet while avoiding shoes. Source: Captured by author

Further preservation procedures include non-invasive testing, anti-seismic precautions, protecting original materials, water management strategies, monitoring systems, visitor control strategies, conservation research, and developing novel conservation materials. Anti-seismic measures protect The mosque is protected from earthquakes, but non-invasive testing reveals hidden issues. Damage can be averted by maintaining the original materials and employing water control methods. Monitoring systems assess the structural health and visitor management's ability to reduce wear and tear. Preservation efforts to enhance cutting-edge technology are combined with continuing conservation studies. The Badshahi Mosque may be preserved while preserving its historical and cultural significance for future generations by putting these recommendations into reality.

#### CONCLUSIONS

In summary, BMLH has greatness in history and size, dignity and magnificence in architecture, and great safety in style and shape. The Badshahi mosque's architectural ornamentation represents the Mughal beliefs, preferences, interests, standards, fashion, and traditions. The many components of Islamic artistry and architecture have been blended in this style, renowned for its particular ornamental shapes that evolved as Mughal monarchs advanced. The design style of BMLH is distinctive because it collected and adapted many aesthetically attractive architectural techniques of previous Eras and formulated them in a new style (Mughal Architecture). From its architectural form, it has been observed that Persian, Buddhist, old Indian, and Islamic architecture inspire it. It is concluded that there is a clear influence of regional, social, empire, traditions, and civilizations over the architectural style of the Badshahi mosque. Thus, it became able to be devoted by its visitors worldwide.

Furthermore, it was notified that some repair work is needed and that care should be taken to properly preserve this important site. For repairs, environmentally safe materials should be utilized. Ornamental elements such as frescoes, calligraphy, and tilework must be restored to retain their historical and artistic relevance. Controlling foot traffic can be accomplished by, for example, removing shoes and not touching walls.

#### AUTHOR CONTRIBUTIONS

Conceptualization, SH and FJ; methodology, SH and FJ; software, SH and FJ; validation, SH and FJ; formal analysis, SH and FJ; investigation, SH and FJ; resources, SH and FJ; data curation, SH and FJ; writing—original draft preparation, SH and FJ; writing—review and editing, SH and FJ; visualization, SH and FJ; supervision, FJ; project administration, SH and FJ; funding acquisition, SH and FJ All authors have read and agreed to the published version of the manuscript.

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**CONFLICTS OF INTEREST**

The authors declare no conflict of interest.

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