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ARCHITECTURAL STUDY OF THE HUMAYUN'S TOMB AND ITS RESTORATION

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Abstract: The first tomb built by the Baburids in India is Humayun's Tomb in the early 1900s, it was the first Indian mausoleum to be built in the char bagh style. This Tomb was also the inspiration for the world's most famous mausoleum, the Taj Mahal and it was designated as a UNESCO world historic site in 1993. However, the commander of this exquisite mausoleum and the architectural style chosen is still unknown. We shall try to identify the commander of Humayun's Tomb and determine which architectural styles were used and whose traditions were used to influence this legacy in this study. Furthermore, we examined the restoration of this tomb and how it has evolved over time, depending on whether it was maintained by the local government or by private citizens. Some of the changes have also occurred as a result of significant events in India's history. The Aga Khan Trust for Culture (AKTC) recently rebuilt the complex, jeopardizing the preservation of major historic events that occurred there.

Index Terms **– Architecture, restoration, design, world heritage site, architectural integrity**

I. INTRODUCTION

Humayun Tomb is an ancient monument of historic importance where the second Mughal Emperor Humayun was buried. Humayun Tomb was built under the auspices of Hamida Banu Begum, also known as Haji Begum (the first wife of the Mughal emperor Humayun) to commemorate the death of her husband, Humayun in 1569. i.e. fourteen years after the emperor's death. The Tomb of Humayun is considered the first exquisite example of the Mughal style based on Persian architecture. As Humayun picked up Persian principles during his exile, it is believed that he designed the tomb himself. According to estimates, it cost 1.5 million rupees (15 Lac) to build and was designed by and Persian architect Mirak Mirza Ghiyath.

Humayun was buried in Purana Quilla, Delhi, where he last lived. Hemu, a Hindu chieftain and Prime Minister Adil Shah Suri of the Suri Dynasty, attacked Delhi after his death. The retreating Mughal army exhumed the bodies of Humayun's captives and transferred them to Kalanaur in Punjab to preserve the sanctity of their Emperor's remains. Following her husband's death, the bereaved queen Bega Begum journeyed to Mecca for a pilgrimage and promised to construct the most exquisite mausoleum in her honor. He enlisted the help of a Persian architect, Mirak Mirza Ghiyas, who hails from Afghanistan's Herat region and has an exceptional portfolio. The study methodology is given in Figure 1.

It was the first Indian mausoleum designed in the charbagh style in the early 1900s and declared a UNESCO world heritage site in 1993. It has changed over time, depending on whether it was maintained by the local authorities or individuals. Some of the changes have also been the result of the important events that have taken place in the history of India. The paper discusses how the Aga Khan Trust for Culture (AKTC) recently restored the complex, compromising the preservation of important historic events that took place there.

Founded in 1988, the Aga Khan Trust for Culture is a philanthropic foundation registered in Geneva, Switzerland. As the 49th hereditary Imam of the Shia Imami Ismaili Muslims and the founder of Aga Khan Development Network, His Highness Aga Khan established it. As a gift on the occasion of India's 50th Independence Anniversary in 2004, the AKTC restored the gardens of Humayun's Tomb in partnership with the Archaeological Survey of India (ASI). The then Prime Minister of India, Dr. Manmohan Singh, encouraged more public-private partnerships to prevent the loss of the national heritage following the successful restoration of the gardens. Therefore, an agreement in 2007 enabled AKTC to return to the site with the Archaeological Survey of India and Public Works Department. Urban renewal initiative to be undertaken in the historic Nizamuddin area. Its notable structures include Humayun's tomb, Nila Gumbad, Isa Khan's garden tomb, Arab Serai gateways, among others. Nizamuddin Basti - a repository of seven centuries of living culture - was being reinvented with the intention of creating a 100-acre city park while preserving the historical monuments of the area. A society's development depends on culture, according to their research. In addition to addressing traditional craft-based approaches to historic monument conservation, the initiative argues that traditional approaches should be revived.

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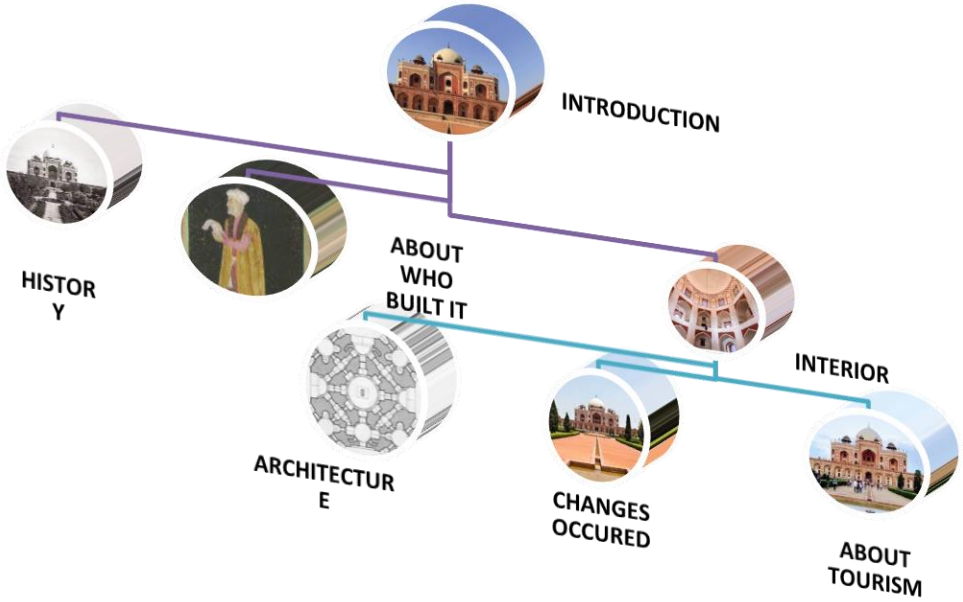

Figure 1: Methodology used to study the architecture of Humayun's Tomb

This project enlisted the help of experts from several sectors. The conservation architects from AKTC were Ratish Nanda and Sangeeta Singh, as well as Jahnwij Sharma, the first architect hired by the Archaeological Survey of India to work on World Heritage Sites, A.G. Krishna Menon, an architect representing the Indian National Trust for Art and Cultural Heritage (INTACH), Rajpal Singh, the project manager, Balbir Singh, the archaeological engineer, and Atar Singh, the site's principle stone craftsman. Their method aimed to restore the complex's appearance to that of the time it was built in 1569. However, between 1569 and 2007, this strategy had a severe impact on the history of the place.

II. ARCHITECTURE OF HUMAYUN'S TOMB

Mirak Mirza Ghiyas - Architect of Humayun Tomb

Ghiyas Beg was born into a family of poets and senior administrators in Tehran. Even so, after his father died in 1576, his riches began to dwindle. They travelled to India with his pregnant wife Asmat Begum and their three children. Ghiyas Beg was appointed Treasurer of Kabul Province during his last reign. The Humayun tombs were built by Mirak Mirza Ghiyas and his son Sayyid Muhammed. In 1572, Humayun's tomb was built in its entirety. Ghiyas perished at Kangra in 1622 while in the mughal camp. His remains was taken to Agra, where he was buried on the Yamuna River's right bank. I'timad-ud-Tomb, Daulah's where he was buried, still exists today.

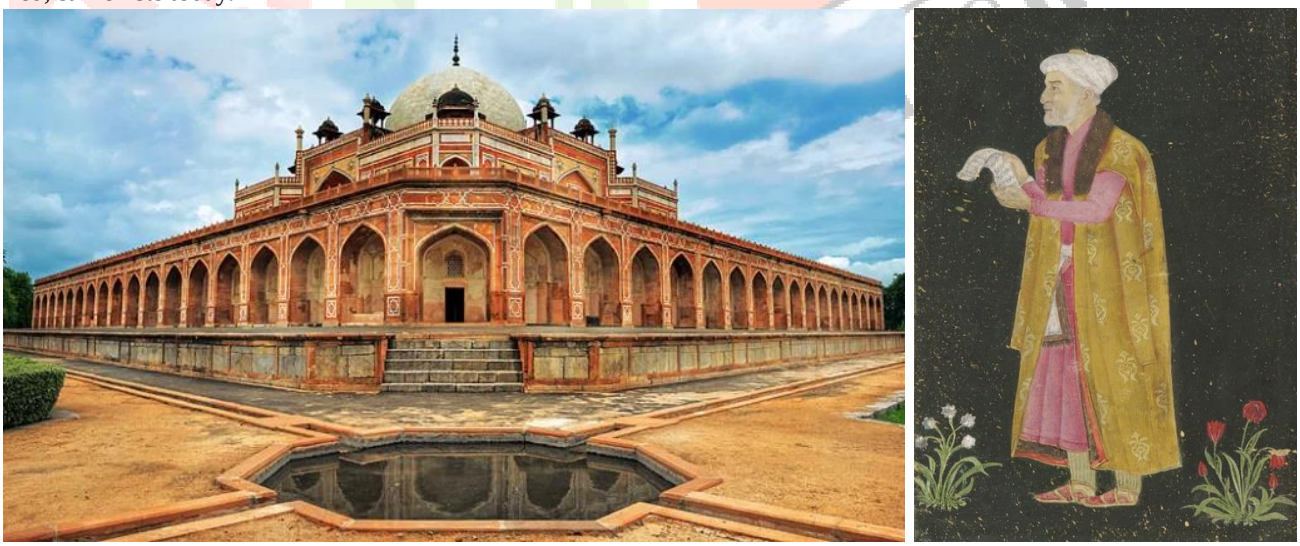

Figure 2: Humayun's Tomb and Mirak Mirza Ghiyas - Architect of Humayun Tomb (Picture courtesy: Archaeological survey of India; Nizamuddin urban renewal initiative)

The exterior of Humayun Tomb

The dome is divided into two layers: the outer layer supports the white marble's exterior appearance, while the inner layer defines the cave's inner volume. The crimson carvings on one tomb are complemented by a white marble decoration. Each façade is encircled by a huge wan, a high arch that is somewhat rearward. A large cemetery's design is complicated. It's a square 'nine-fold plan,' with eight eight-story rooms sprouting from the central space. On each level, straightforward and dyed roles connect the rooms. Each of the main chambers of Humayun's tomb has eight more chambers, and smaller chambers emanate from them. There are a total of 124 vault chambers in the comparable ground system.

The tomb, which stands around 7 feet tall, is situated in the centre of the plinth. Its central dome reaches a height of 140 metres above the ground. The dome is divided into two layers: the outer layer supports the white marble's exterior appearance, while the inner layer defines the cave's inner volume. The crimson carvings on one tomb are complemented by a white marble decoration.

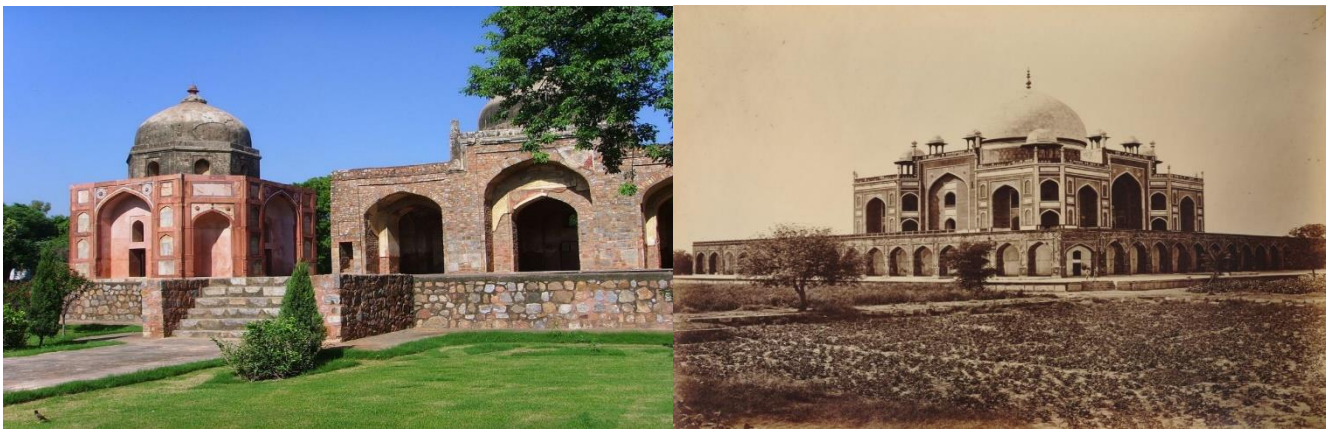

Figure 3: The restored and old Humayun's tomb (Picture courtesy: Archaeological survey of India; Nizamuddin urban renewal initiative)

The interior of Humayun Tomb

The square is essentially constructed, albeit it has edges at the borders to make an octagonal, to lay the groundwork for the inside construction. The pedestal, which is formed of rubble, is surrounded by fifty-six chambers and contains over a hundred tombstones. Furthermore, the entire foundation construction is built on an elevated platform with a few additional steps. The tomb reaches a height of 47 metres (154 feet) and the plinth is 91 metres (299 feet) wide, and was the first Indian structure to use a double Persian dome for a high neck drum, measuring 42.5 metres (139 feet), and run 6 metres (20 feet) high finial final end in a crescent, which is common in Timurid cemetery. The outer layer of a double or'double' dome supports the white marble façade, while the inner layer creates the cavernous inner volume formation. A vast room with a symbolic object facing Mecca in the west, a mihrab design on a marble lattice or jaali. This room has a high ceiling and is made up of four huge octagonal rooms on two floors, aligned in diagonals with wooden shelves connecting them, and four ancillary rooms in the middle, implying that the tomb was created as a dynasty maynoleum.

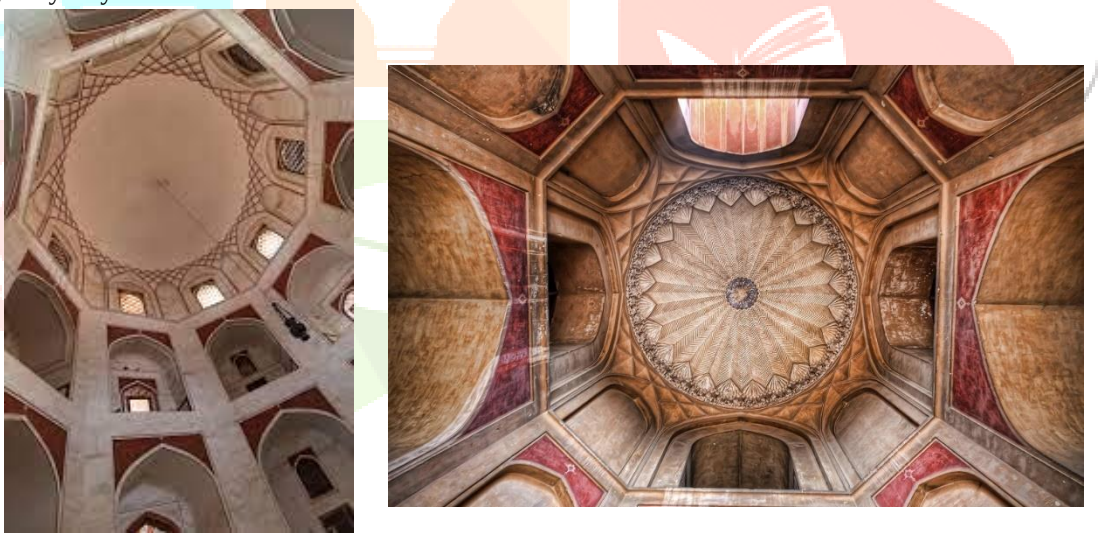

Figure 4: Humayun's Tomb main hall; Nila Gumbad (Picture courtesy: Archaeological survey of India; Nizamuddin urban renewal initiative

Humayun's mausoleum is India's first Mughal tomb. This style is a fascinating mix of architectural elements from Persia, Turkey, and India. The species first appeared during the era of Akbar the Great and peaked during the reigns of Shah Jahan, Akbar's grandson and fifth Mughal Emperor. In terms of magnitude and magnificence, Humayun's tomb signaled the beginning of this new architecture in India. The stunning structure stands at a height of 7 metres in the heart of a 216000 m2 garden landscape. The garden is a Char Bagh in the traditional Persian sense, with four main thoroughfares leading from the centre house and dividing the park into four pieces. Waterproof materials can also be used to embellish bridges. The Garden of Paradise is symbolised by this Persian Timurid style of architecture, which, according to the Quran, comprises of four rivers: one water, one milk, one honey, and one wine. There are also trees in the garden that provide shade, produce fruit, produce flowers, and provide food for birds.

According to Islamic custom, one cenotaph aligned with the north-axis axis divides Humayun's tomb in a central burial chamber. The main area is divided into eight smaller rooms. There are a total of 124 rooms in the structure. Cenotaphs of various members of the Mughal royal family and officials can be found in a number of modest rooms. The mausoleum's top is a 42.5-meter-high double dome in Persia, surrounded by plundered clubs, or chattris, which are typical of Indian architecture. Many of the dome's elements were among the most noticeable aspects of Timurid architecture in the fifteenth century. Instead of a single dome, as was common in pre-Mughal India, the artist created a double dome to show the inhabitants' and their manager's relationship to the Timurids. Because more than 150 Mughal family members are buried there, Humayun's tomb is also known as the 'Mughals' home.'

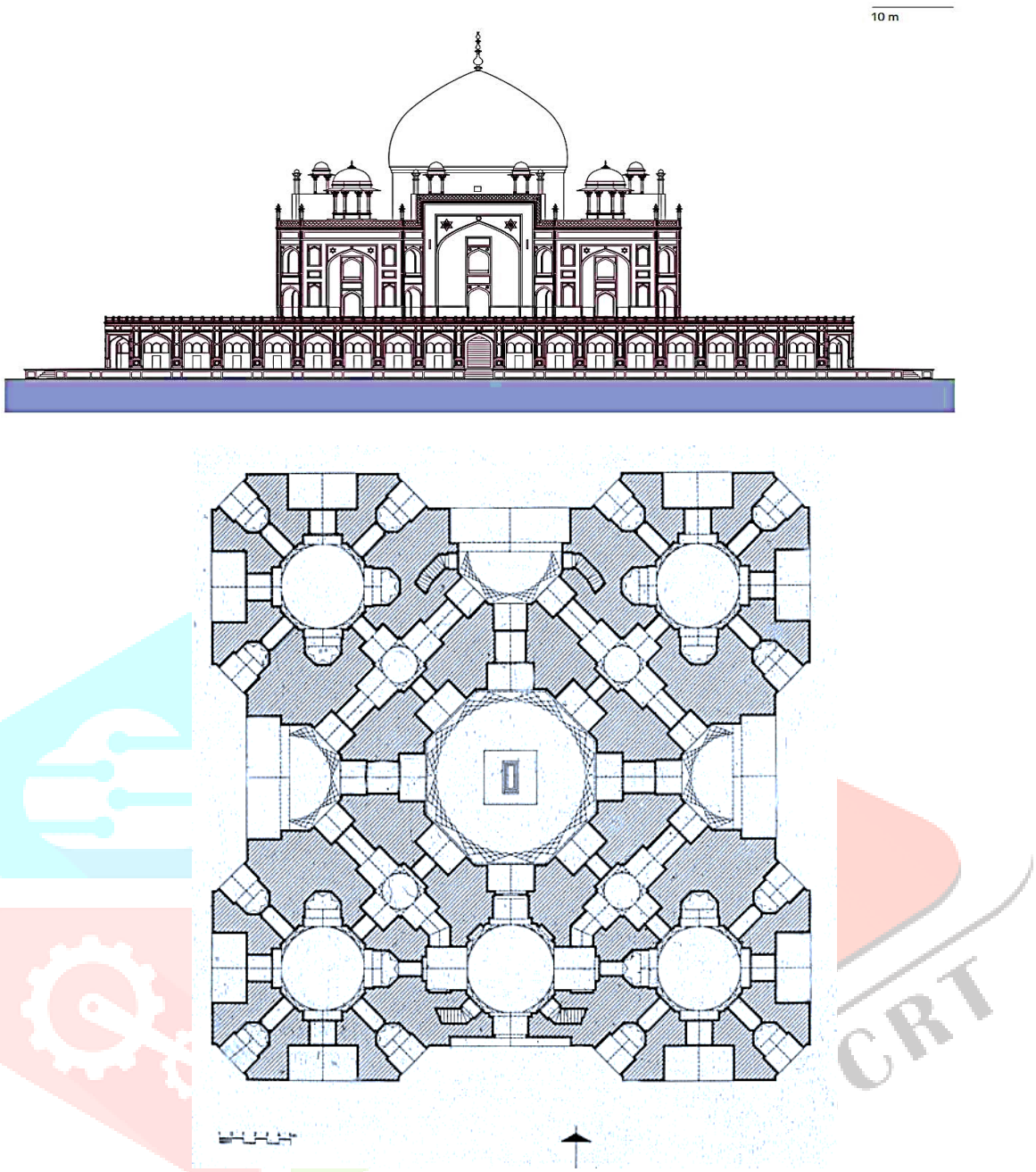

Figure 5: Architecture and first floor plan of Humayun's tomb (Picture courtesy: Archaeological survey of India; Nizamuddin urban renewal initiative)

During the construction of Humayun's tomb, the emperor's painters were simultaneously working on the Hamzanama, a text that took fifteen years to complete (from roughly 1562 to 1577). The paintings of Hamzanama are startling in their boldness; they are huge (about 66 by 52 cm), brilliantly coloured, and full of motion. At Humayun's tomb, this emphasis on direct visual appeal and strong design is exactly what you'll find. Despite the fact that they work in distinct mediums, both want to create imagery that is as direct as it is exciting, and that can be comprehended without the need for extensive linguistic explanation. It may be claimed that this effort was not totally effective in the case of Humayun's tomb since many of the notions Akbar was attempting to represent, such as his relationship with his father, were either too intricate or too fresh to be conveyed symbolically.

III. RESTORATION STUDY OF HUMAYUN'S TOMB

Only a few years after its erection, Humayun's Tomb began to deteriorate. This began in 1556, when the Mughal empire's capital moved from Delhi to Agra. The decline of the Mughals, and the subsequent lack of available cash for the costly upkeep of the large gardens, hastened the deterioration of the park, which began in 1556. In the year 1600, the British began arriving in India. Following the capture of the last Mughal emperor Bahadur Shah and the murder of his three sons during the Indian Rebellion of 1857, the British assumed entire control of Delhi. After a few years of British control, they seemed to be lacking something. As a result, they began turning the Mughal charbaghs into a British landscape with flat gardens and consistently planted bushes, some of which can still be seen in the Taj Mahal's gardens. Lord Minto, the Governor General (1807-1813) who oversaw the TajMahal renovations, is thought to have ordered the similar adjustments in Humayun's Tomb. The four central square pools were replaced by circular beds and the trees were planted in the flower beds. The proof is there in the photograph.

The Archaeological Survey of India (ASI) took over the responsibility of monitoring India's cultural sites in 1960, and worked to repair the damage caused by the refugee camp. Before the AKTC took over, the ASI attempted four times to repair and restore the damages to the tomb. It's crucial to know how the AKTC team renovated the tomb in order to comprehend how the restoration

resulted in mucking up the historic past represented by the tomb. The AKTC team includes conservation architects Ratish Nanda and Sangeeta Singh from AKTC, as well as Jahnwij Sharma, the Archaeological Survey of India's first architect. A.G. Krishna Menon, the architect representing India, is in charge of World Heritage Sites. Rajpal Singh, project manager for the National Trust for Art and Cultural Heritage (INTACH), Balbir Singh, the archaeologist, and Atar Singh, the chief stonemason on the project, site, conducted a thorough investigation. The study was based on meticulous documentation. Laser scanning in three dimensions. The above-mentioned AKTC team conducted an extensive condition evaluation, which found that the tomb and its surrounding structures were in relatively good shape.

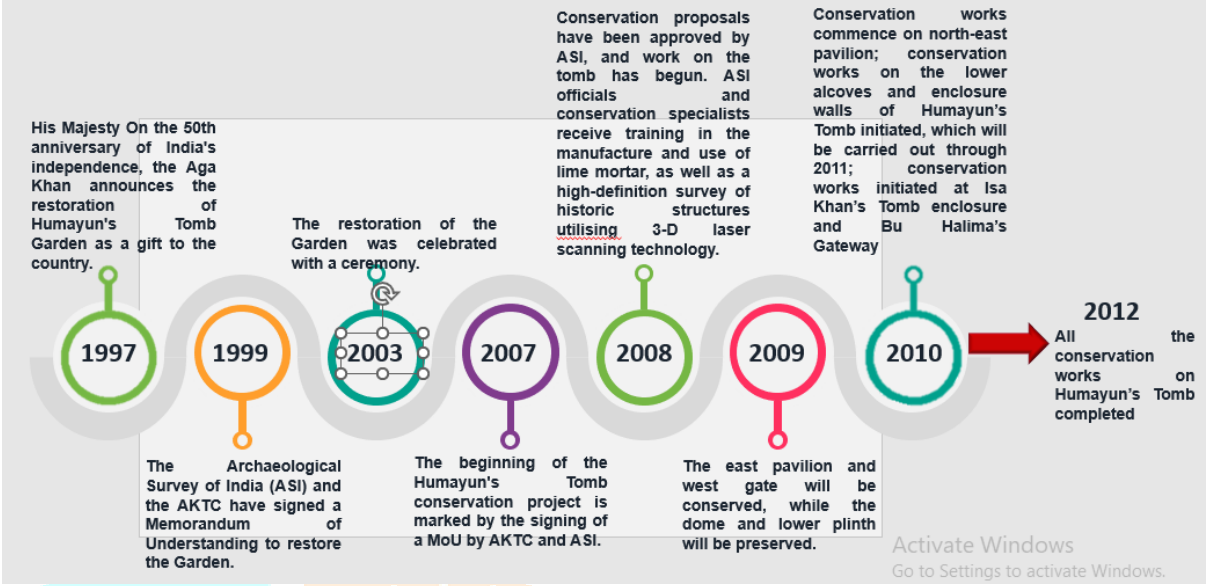

Figure 6: Infographic timeline of the restoration work at Humayun's Tomb.

The tomb was in a stable state, however there was severe deterioration and water leaking. Water seepage from the terrace, material deterioration on the tomb's front, broken tiles on the tomb's roof kiosk, severe damage to the tomb's dome, and water leaks were all part of the deterioration. The architectural elements utilised by the Mughals had been harmed, according to the AKTC team, by "prior renovations in the 20th century," as they put it, carried out using inappropriate modern materials. As a result, they focused their conservation efforts on restoring the structure's architectural integrity through the use of traditional construction methods and the assistance of locally experienced artisans, masons, stone carvers, plasterers, and tile craftsmen. One of the main issues for the mausoleum was water seepage from the roof. To fix the problem, craftsmen removed a million kilos of cement concrete that had been laid there in the twentieth century to prevent water penetration in order to uncover hidden architectural components. The masons had painstakingly filled the joints in the marble after removing the concrete before the plasterers rebuilt the inside of the dome. The stone paving of the lower plinth was rebuilt after removing 40,000 square feet of concrete and painstakingly resetting the stone blocks, which weighted up to 2500 kg, according to an AKTC report on the project brief. The sandstone terrace needed to be raised as well, as it had sunk over time (perhaps due to the weight of the concrete). The sinking of this entire terrace could have occurred when a considerable amount of concrete was put here to avoid water seepage during the PWD's attempt to prevent water seepage, as well as the ASI's four additional attempts to do so. Every time the water seeped through, a fresh layer of cement was put to the floor. As a result, rather than improving the issue, this actually worsened it by producing additional water seepage due to the cement's propensity to hold water. The multiple layers of cement were unable to connect adequately, and the addition of water to those layers resulted in unequal water seepage. This produced substantial cracks in the building. Before resetting 5400 square metres of sandstone to its original shapes and patterns, these structural fissures were carefully patched together. The stone carvers also lifted roughly 3700 square metres of stones that were discovered beneath the prior cement repairs done to the terrace, under the supervision of Atar Singh, the primary stone craftsman. It took up to 15 craftsmen to re-set some of the stone blocks. The stone paving on the terrace was laid down in the same patterns as before the twentieth-century renovation. The rainwater flow slope was also maintained. The red sandstone and marble inlay used to restore the contrasting red and white patterns on the tomb's surface was an important aspect of the tomb's repair. The principal stone craftsman, Atar Singh, examined each stone of the facade to decide if it needed to be repaired or replaced. The stone carvers worked on each stone by hand to reach the level of perfection required to match the stone's original polish. The masons repaired the 42 arched niches of the garden enclosure wall that had collapsed in the twentieth century using traditional building techniques.

The almost 15cm thick cement plaster that was applied to the Northern and Eastern pavilions, the Southern and Western gates, and the tomb's ground facade caused substantial damage. During the 20th century renovation, they used it on their stone masonry. To bring these back to life, All of the cement plaster was removed from the structures, as well as around 20,000 square metres of wall and ceiling space. Lime mortar was used to plaster the ceiling surfaces. With ingredients like molasses, egg whites, fruit pulp, or marble dust, this lime mortar was made in a lime wheel. This lime plaster was placed in layers, with the outermost layer of 1mm thickness, to make it look like marble, according to the original Mughal building process recorded in the ASI's archival files, as researched by the AKTC team. The removal of the cement plaster and restoration of the ornamental star-shaped patterns of the 68 minimausoleums on the ground level, where 160 Mughal family members were buried, was another significant effort.

IV. CONCLUSION

The Humayun's Tomb is a sophisticated, complicated, and extremely well-executed structure. The building's power comes from its combination of boldness and elegance, energy and strength. The monument's forcefulness and endeavor to build an altogether new approach to architecture in India are not diminished by the fact that its portions have varying degrees of success. As a result, masterpieces like the Taj Mahal were created. The restoration works have played a significant role in keeping the art and architecture of the place alive. In the conservation of the patterns and decorative works on the structure, the AKTC placed a high priority on applying the traditional craft-based approach. The goal of the AKTC is to preserve not only the architecture but also the culture and art that has been passed down through the generations and they have performed the job in an excellent manner.

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