Influences and Approaches Shaping the Architectural Roots of Pakistan: An Analysis of the Works of U.S.-Based Architects in Pakistan

Quratulain Asghar, Fatima Javeed & Zille Ali

Abstract

Architects from the United States invited to work in Pakistan in the 1960s and later years helped lay down the foundation of modern day Pakistani architecture. Thomas Payette, Richard Neutra, Edward Durell Stone and Leo A. Daly are some of the notable names responsible for some remarkable construction feats. The Aga Khan Medical Complex, the U.S. Embassy, the Pakistan National Shipping Corporation (PNSC) building, the Habib Bank Plaza in Karachi, the Wapda House in Lahore, the Pakistan Institute of Nuclear Research and Technology (Pinstech), and the Presidency Complex in Islamabad are some of the examples. While these buildings may have been mere experiments combining local building styles with international modernist philosophy, they stand out as inspiring masterpieces for modern Pakistani architects of today. The U.S.-based architects constructed buildings stand true to the local values, whilst adding an international identity to the cityscapes of major urban centres across Pakistan. This article focuses on how these foreign architects handled the challenging task of producing architecture that would resonate with the Islamic identity of the state and would help set an exemplary precedent for modern architects. The major

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aim of this article is to identify and study the important buildings designed by U.S. architects and to find out the inspirations and influences that led to their proposed designs. The article also enumerates the factors that affected and, at the same time, helped the evolution of contemporary Pakistani architecture.

Keywords: U.S. architects, identity, Islamic architecture, architecture.

Introduction

With the creation of Pakistan in 1947, the British government handed over the administration and infrastructure to the incoming heads of state. Starting from scratch and facing hostilities on multiple frontiers, the new country had no time to focus on architectural progress in the early years of its existence. Throughout the 1960s and 1970s, the government continued facing various problems with the biggest among them being the settlement of millions of refugees pouring in from the Indian side of the border.[1] Political turmoil and regional economic disparity also hampered progress in the early decades and not many significant buildings were added either in the private or government sphere. The government even faced shortages of office buildings to house its own departments working on issues like food scarcity and distribution of property.[2]

The need for construction of purpose-built complexes, offices, and buildings led to another question: What would modern Pakistani architecture be like? A sustainable solution to this question could not be found because of the shortage of experienced local architects in the country.[3] The government, therefore, decided to invite foreign architects to undertake important construction projects – especially those concerning major political installations – that would set the base for

modern Pakistani architecture. Also, there was a wave of adopting new architectural trends in South Asia. While India adopted the designs of French architect Le Corbusier, Pakistan went for the designs of Greek architect Constantinos Apostolou Doxiades. Both of these architects went on to have a great impact within the modernist trends in their respective countries. [4] Even with an inclination towards modern architecture, religion remained a major factor in shaping the designs of major projects in Pakistan. Because of the country's creation in the name of Islam, religious self-assertion of some kind was the raison d'etre of the nation post-independence. Almost every prominent project was met with skepticism from the clergy.[5] This continued during the pro-development regime of Field Marshal Ayub Khan between 1958 and 1969.The prime example of this obsession with religion came with the announcement of building a new capital city by the name of Islamabad. The name of the new capital alone gave evidence: a combination of Islam and *abad*–an Urdu word for settling. Two letters were sent out to order the planners to even build the roads and streets of Islamabad in the direction of the *Holy Ka'aba*in Makkah, Saudi Arabia.[6]

Doxiadis was assigned the task of designing the master plan of Islamabad. Keeping in view the zealous demands of the authorities, the Greek planner made special efforts to create a link between the two nouns that have become so ubiquitous in academic literature they have almost become a cliché: Islam and modernity. Doxiadis kept on designing Islamabad's master plan as practically as possible while accommodating Islamic architectural archetypes in his design.[7]

Until then, Pakistani architecture had not been following any specific directions with the availability of a myriad of historical styles from the Mughal and British eras, and the Indo-Saracenic and the neoclassic styles.[8] Local craftsmen were in charge of construction and absorbed the changes of different

eras, creating a sense of confusion. Mughal architecture could not be followed as the young nation did not have time for embellishments and detailing used in traditional Mughal buildings. Also, some traditional skills like mosaics, glazed ceramic tiles, calligraphy, and tiling were lost over time,[9] and there was no skilled labour available to achieve the perfection achieved by our ancestors. Construction techniques also changed over time and the availability of new materials, such as concrete, opened new horizons and restricted the builders and labourers from following old practices. While the country was in a state of architectural confusion, foreign architects gave the nation projects that set the benchmark for contemporary architects.

This article aims to convey an understanding of the approaches undertaken by the architects invited from the U.S. for fulfilling the demands of the Pakistani government as well as creating buildings with proper architectural foundations. The first part of the article analyses the inspirations that these architects drew from the local heritage, while the second part explores how they used modernist philosophy to make buildings user-friendly and contextually strong.

Part 1: Analysing local influences

During the 1960s and 1970s, architects from the U.S. were involved in the construction of many impressive buildings in Pakistan such as the Wapda House in Lahore, the Presidential Complex in Islamabad, and the then U.S. Embassy in Karachi. All these architects consciously reflected the local heritage in their designs. Some influences that directed their architectural design are discussed below.

Climatic Conditions

One of the major considerations for foreign architects was the local climate. Accordingly, Richard Neutra's design for Karachi's U.S. Embassy (1955-1960), Edward Durell Stone's plans for Wapda House (1965), Pinstech (1961), and the Presidency Complex; and Thomas Payette's design for the Agha Khan Medical Complex – now known as the Aga Khan University Hospital – (1970), all took the climatic conditions of their respective cities into consideration.

Figure 1: U.S. Embassy, Karachi Pakistan with slit windows running on façade. Photos by © Architect Arif Bilgaumi, used with his permission.

The design of the then U.S. Embassy in Karachi, which has since been downgraded to a consulate general office and shifted to another location owing to security concerns, almost entirely stays true to the international style[10], yet contains elements that accommodate the port city's climatic conditions**.** [11] To introduce a refreshing microclimate and acoustical tempering in Karachi's heat and humidity, Neutrain corporated extensive landscaping all around the building by constructing waterways and pools, and used *Mashrabiya*s[12] that helped in keeping the temperature within the premises low and the sun away. The windows used in the building have operable metal louvers and insect screens to minimise direct heat and wind inside the building. Bands of three continuous slit-

windows run on both east and west façades of the building. These slit windows are an attempt to keep the sun out as much as possible. In addition, the south façade was built with cemented vertical louvers to avoid direct sunlight.

Explaining his concerns about the building design, Neutra wrote to his colleague: "There is practically no pleasant solution on the west front. All windows are a thermal nuisance and no matter what we do, the outlook is dismal. No embellishment of the yard will help–the sun will glare, and the best is to consider shaded narrow strips of openings here, in the direction of the Arabian Sea breezes. I wish the sea were close and visible …"[13]

Conversely, Stone was not much concerned about the scorching sun of Lahore while designing the Wapda House.15He did provide ribbon windows on the façade to reduce direct sunlight from entering the building, but at the same time kept them corrugated, which tends to increase the surface area. Architect Kamil Khan Mumtaz, in his book *Architecture in Pakistan,* has criticised the building for its heat gains: "An example of this is Edward Durrell Stone's Wapda House in Lahore. Its corrugated façade increases the external wall area and thus the heat gain in a centrally air-conditioned building; its perforated canopy provides protection from neither sun nor rain; the central well provides light in generous measure to the blank walls of service shafts and lifts; and the great plastic dome above serves as a heat trap. Moreover, the final cost exceeded the original budget three times over, and the net rentable space is only 30 percent of the total floor area."[14]

In contrast, Stone's other projects such as the Cabinet Division building, the President House, or Pinstech, incorporated the cantilevered roof technique and extensive use of slit and ribbon windows to control sunlight and provide shade to the building.

Stone also has provided the double-height colonnaded verandas in almost all of these buildings. The best example of this is the Pinstech complex, which is rectangular in form**.** The laboratories of the nuclear institute are planned on the northwest and southeast sides of a large rectangular courtyard. The reactor is located in the middle, whereas, a double-storied colonnaded veranda on the southeast side encloses the courtyard. According to Stone, his design provided maximum shade for the buildings under an unrelenting sun.

Figure 2: The Wapda House in Lahore. Photo by © Ar. Kamil Khan Mumtaz, used with his permission.

Diverging from colonnaded verandas practice, Payette's design for the Aga Khan Medical Complex in Karachi used traditional *jalis*[15] to control the amount of sunlight and the wind entering the complex. This cement meshwork had been designed such that each opening was spaced closely, wider from the outside and narrower from the inside. Payette also deployed traditional techniques of passive climate control with the help of terracotta *brisesoleil*[16], sloped roofs with wind scoops, courtyard design, use of water and wall mass; all of which have greatly helped reduce the dependence on air conditioning in the complex.

Landscaping Concepts

Since the *Holy Quran* describes paradise as a garden, landscaping always has been an important part of Islamic architecture. [17] Numerous Mughal construction works also incorporated the Persian concept of *chaharbagh* [18] that was adopted by the U.S. architects working in Pakistan as well. Landscaping is a prominent feature in the master plan of the Presidency Complex. In addition to the building being axially symmetrical similar to *chaharbagh* design of the front garden, it also has a beautifully laid out infrastructure of water channels and bodies.

Figure 3: a) Parliament House, Islamabad b) President House both designed by E.D Stone. Photos by © Ar. Rana Atif Rehman, used with his permission.

While working in Asia, Stone noted: "This obsession with monuments of the past may seem sentimental and pedantic, but I believe the inspiration for a building should be in the accumulation of history. Although none of my buildings copy classical examples, they have a formality and I hope, a dignity that one associates with historic monuments… I try to find an architecture that is hopefully timeless, free of the mannerisms of the moment. Architecture should follow a grander and more ageless pattern and it can and should be approached simply."[19]

Similarly, Neutra's design for the U.S. Embassy in Karachi used multiple landscaping techniques, bringing together plantation and water channels. The water skirting the gardens

not only symbolises the Mughal technique of gardening, but also functions to irrigate the plantation, thus assisting the plants in dry and barren conditions of Karachi. The Embassy building on the one hand became a symbol of modern Pakistani architecture and on the other, served as a prime example of architectural landscaping in the new state. The design brief from the U.S. government for the building had laid strict emphasis on landscaping, stating: "The grounds and landscaping will be as important as the architecture, and together are to be conceived as an integrated whole. The grounds will be viewed as functional and representational space, and will be sustainable, and include indigenous plantings and incorporate existing site resources, such as mature trees …" [20]

When designing Pinstech in Nilore near Islamabad, Stone had to face an additional problem of meeting Pakistan's Atomic Energy Commission (AEC) standards, as the building included a nuclear reactor and its pool, x-ray and gamma ray rooms as well as hot cells along with various other imperative features. Stone, however, did not feel restricted by these limitations and added some common Mughal features to the building. He designed the entrance with a large pool and a fountain. Within the courtyard of the building, a water channel, lined with fountains, runs up to the nuclear reactor, the dome of which has been done with waterproof stucco with an intricate design. A tower rises behind this dome, which not only brings out a mosque-like look, but also acts as the exhaust stack and water storage tank for the reactor. The pool around the dome acts both as an ornament to the design and the reactor's pool while the fountains lining the water channel work as cooling streams for the air-conditioning system.

Use of decorative techniques

The works of Stone, Neutra, and other prominent U.S. architects in Pakistan depict the use of another common feature of Islamic architecture – geometric patterns using various masonry techniques and aesthetics.

Neutra's design for the U.S. Embassy in Karachi boasts a perforated wall with an abstract geometric pattern, which has been one of the major features of Islamic architectural heritage used mainly in semi-private areas to enhance privacy in a decorative manner.

Figure 4: Perforated wall and Geometric Screens used in U.S. Embassy Karachi. Photo by © Ar Arif Bilgaumi, used with his permission.

Stone took the concept of perforation a bit further at Wapda House and moved it from the walls to the cantilevered roof. This perforated canopy not only adds to the beauty of the building by reflecting Islamic architecture in a modern form, but also creates beautiful patterns onto the building when sunlight falls on it. For the walls, Stone chose to go with a simple geometrical pattern that runs throughout the exterior and interior of the building, thus adding a touch of local construction aesthetics to the seemingly all-modernist building.

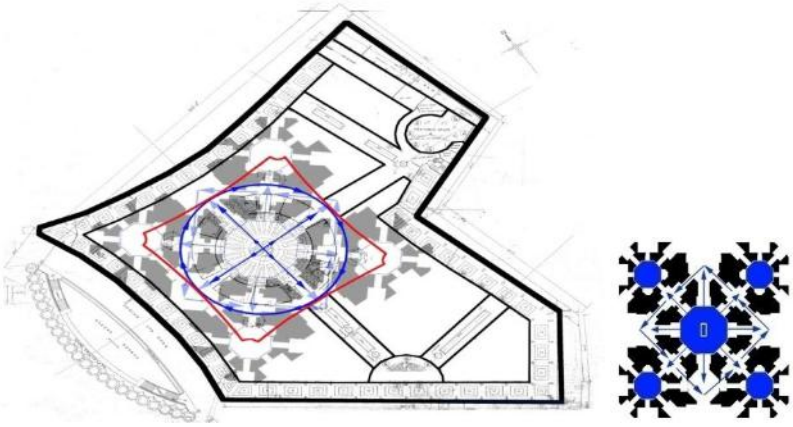
Following the Mughal concept of grandeur at Pinstech, Stone designed a grand stairway leading up to the podium, on which the entire building stands. The canopy is cantilevered and

perforated like at Wapda House, but with a different pattern of perforation. He has decorated the thin-shell dome with slender rounded arches, also capped by concentric rings of circles, resulting in a visible geometric pattern. Further, Stone has used bold geometric patterns on the floor of both the Wapda House in Lahore and the President House in Islamabad.

Geometry and Symmetry in Design

When it comes to the use of geometry and symmetry in design, Stone, among all the North American architects working in Pakistan, turned out to be the most inspired by the Mughal construction ethic. The Mughal were famous for producing symmetrical and axially balanced structures on irregular sites. A study of Stone's floor plans for Wapda House, Parliament House, Presidential Palace, and Pinstech demonstrates symmetrical floor plans using simple geometric shapes.

Considering the design of Wapda House, for instance, the core plan is a square with slightly indented walls that merge into a circular atrium with a circular dome on the top, forming a cylindrical centre. Four staircases are placed at every corner of the square and go upwards to open into the grand circular atrium. Like Mughal structures, a symmetrical building rises from an irregular site. The building also has a symmetrical plan with a central atrium that connects other spaces, generating movement and balanced geometry. Famous Mughal buildings such as the Humayun's Tomb in Delhi, India, follow the same pattern.



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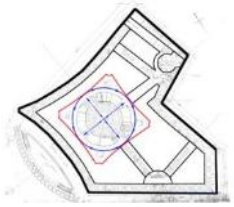

b)

Key plans:

a) Humayun's Tomb plan b) Wapda House

Figure 5: Symmetrical building (in red) of Wapda House rising from irregular site in Lahore and underlayed is Humayun's tomb showing similar characteristics of symmetry, balance and movement from centre and circumambulation. Source: Authors

In the Parliament House in Islamabad, Stone has used just two basic shapes: a square and a circle, keeping the plan geometric and simple. The circular assembly hall lies enclosed within a square office block. An axially placed pair of staircases provides entrance, keeping the entire complex perfectly symmetrical. If observed carefully, Stone has even designed the master plan of the Presidency Complex by placing the

Cabinet Division, Parliament House, and President House buildings in a strict symmetry and axially balanced arrangement, linking the in-between areas with the help of *chaharbaghs* and water bodies to give a royal touch to the complex.

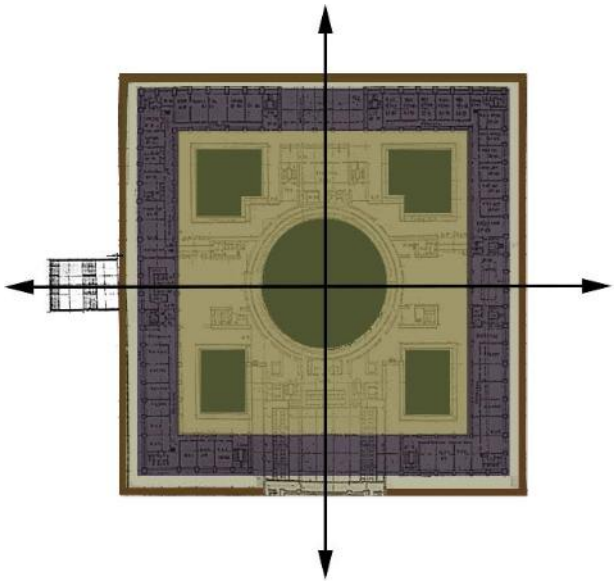

Figure 6: Symmetrical and Geometrical Plan of Parliament House Islamabad, Pakistan. Source: Authors

Pinstech saw Stone's experimentation with the geometric floor plan without the use of circles. Here, the architect enclosed a rectangular courtyard using colonnaded corridors and verandas. This technique also has been adopted in the Cabinet Division building, but with the help of square geometry.

Political Influences

As with most developing countries, the Pakistani government also used its influence on architects from the U.S.to manipulate the designs of important buildings. The government wanted the

Presidency Complex to reflect the Islamic ideology of the State. Therefore, Stone proposed a plan with domes and arches – both icons of Islamic architecture. The building design was kept in formal symmetry as per the Mughal style of construction. However, before construction could start, the administration of the country was taken over by the army whose different way of thinking affected the original plan. Several changes were proposed, of which the removal of domes was one.

Before Stone, the Islamabad Capital Development Authority had tried to rope in many big-name architects to design the Presidential Complex. First, Arne Jacobsen from Denmark was invited to design the Parliament building. His proposal was criticised for its uncompromising 'modern' design. Jacobsen was replaced by U.S. architect Louis Kahn, who was very enthusiastic about the project and wrote: "The insistence of the Islamic touch is plaguing but in spite of this, it can stimulate resources not called on before."[21]

Kahn submitted three successive proposals to the government, but was still relieved of his duties. According to the then government spokesman: "the reason for the rejection of Professor Kahn's design was his inability to modify the design so as to reflect Pakistan's desire to introduce Islamic architecture in Islamabad's public buildings." [22] Eventually, Edward Durell Stone Sr., was given the chance to produce his design for the Presidential Complex. After a series of changes, planning, and re-planning, the mammoth project began.

In the case of Islamabad's own planning, Greek planner Doxiadis pleasantly preferred the political establishment to carry through with the programme for the new city. He also agreed with the authorities on the isolation of bureaucracy as he saw it as a way to control the city, resulting in a city plan

following a strict gridiron pattern, which also suited the concept of surveillance.[23]

Another factor that affected all these architectural projects was Pakistan's relations with India. This bilateral relation always has been somewhat bumpy and, no matter what, a sense of competition prevails on both sides of the border. The competition became evident in the design and planning of Pinstech. Stone's highly celebrated design of the U.S. Embassy in New Delhi, India, won him many fans in Pakistan and helped him win major projects across the country, especially in and around the capital city of Islamabad.[24]

For Pinstech, the Pakistani authorities wanted Stone to work on the same lines as the U.S. Delhi Embassy, while growing the scale of the project several folds. H. Usmani, the chief of the Pakistan Atomic Energy Commission in 1960, said: "There is not the slightest doubt that he [Stone] is among the top architects of the 20th century. Mr. Stone is one of those rare individuals who has imbibed a great deal from Mughal architecture and can develop a concept which can blend functional aspects with beauty at a very reasonable cost." [25]

Contrariwise, the Aga Khan Medical Complex in Karachi had little or no political influence. Prince Karim Aga Khan just wanted the building to be a state-of-the-art medical facility and Thomas Payette was given full liberty to design whatever he wanted.

Figure 7: Agha Khan Complex Karachi showing use of jali and natural stone. Photo by © Fida Jan (Student), used with his permission.

Part 2: Adaptation of local heritage into the modernist philosophy

When the Pakistani government acquired the services of U.S. architects, a modernist approach was being practiced around the globe. The notion that 'form follows function' had taken the shape of a philosophy that most architects would adhere to. Symmetrical designs, 90-degree angles, and horizontal and vertical straight lines were common features in global architecture. When designing in Pakistan, these guest architects also adopted some degree of modernist elements in their buildings.

The Mid-Century Modern Aesthetic

In Pakistan, Stone played a major role in the use and promotion of the modernist thought. He kept the façades of all the three main structure sat the Presidency Complex white and free of any decorative features or ornamentations.

In the PNSC building, a modernist skyscraper dotting the skyline of Karachi, Stone kept the façade minimal and all four sides of the building were treated with similar-sized bands. The use of glass was also minimal with recessed windows

sandwiched between the terrazzo bands. The façade of the PNSC and Wapda House buildings has been subtly decorated by a specific geometric pattern engraved in the white terrazzo, reflecting Stone's modernist philosophy blended with the local culture of using decorative patterns. Stone's design of Pinstech was simple: straight elevations, colonnaded verandas, and courtyards. The building was painted all white. Again, the effort beautifully combines the local heritage with the then new style of modernism.

Figure 8: a.) PNSC (Pakistan National Shipping Corporation Building), Karachi b.) HBL Plaza, Karachi. Photo by © Fida Jan (Student), used with his permission.

Importance to the User

In the 20th century, the modernist architectural philosophy resulted in the designing of more and more practical and user-friendly buildings. U.S. architects when they came to Pakistan created designs according to the need of Pakistani culture, values, aesthetics, climate, and religion. They incorporated

elements to facilitate the user and to design buildings that engaged those users who were not alien for Pakistanis.

The then U.S. Embassy in Karachi was a prime example of Neutra using his experience of working with people of varying cultures, aesthetics, and religion. He was the first one to hold discussions with an authoritative Islamic scholar to come up with a design to include the needs of Muslim staff. The Embassy has an ablution fountain and a prayer floor below the cantilevered part of the embassy's ceiling. Neutra's proposal of the master plan for the University of Engineering and Technology, Lahore (UET), also envisioned user-friendliness and relevance in two different ways. Firstly, he placed a mosque right in the centre of the campus to make it accessible for everyone and to make its minaret a symbol of the Islamic university. Secondly, he designed an exhibition hall near the entrance, where a permanent exhibition of models and illustrations would show the visitors what the university and its students offered to the cities of Pakistan.

According to Neutra, this exhibition would keep the university from being alienated and allow the passersby and the public to know the institution better. Faculty and staff residences were placed at the back, away from the main activities and noise. Unfortunately, this plan was never implemented but its design showed the idea to accommodate the culture, religion, and the people of Pakistan.

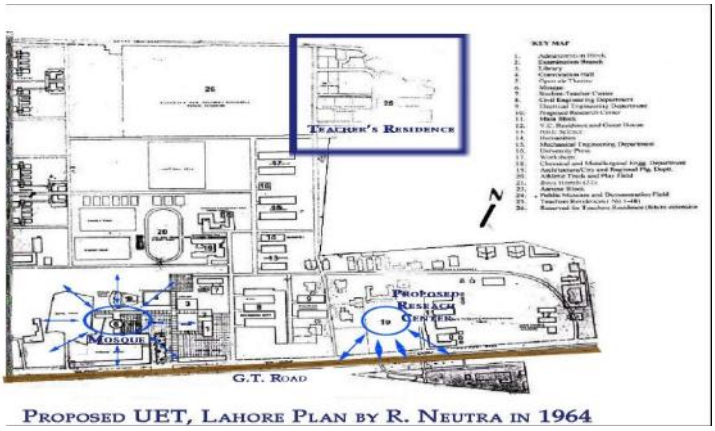

Figure 9: Proposed plan by R. Neutra for the University of Engineering and Technology, Lahore. Source: Building and Works Dept., UET, Lahore, used with their permission.

Similarly, the Aga Khan Medical Complex was also planned keeping in view its friendliness for future users. The extensive courtyards and verandas within the unique 'spine and fingers concept' [26] of the master plan, made the whole complex practical by providing interesting practical sitting spaces and envisioning future growth as well. The verandas and courtyards help in combating the heat and humidity of Karachi.

About the master plan, Payette Associates stated:"Courtyards and verandas are emphasized as organizers and condensers of human activity. At the core of this project is a commitment to making places for people, a precept that drives the master planning at all scales." [27]

Figure 10: Aga Khan Medical Complex showing landscape and properly designed sitting and waiting areas. Photo by ©Fida Jan (Student), used with his permission

Importance of Context in Design

Before the arrival of architects from the U.S., the majority of buildings in Pakistan had introvert planning. The modern approach introduced Pakistan to the building's relationship with context. This approach completely changed the way of thinking of the Pakistani architects, civil engineers, and city planners.

Neutra's master plan for the UET remains a great example of laying importance on context. The way Neutra wanted the minaret to rise and be seen from the nearby highway, and wanted outsiders and the passersby to interact with the building, clearly depicts the importance of context in his mind.

International Identity Given to Pakistani Architecture and Cityscapes

After independence, Pakistan lacked an international identity in terms of cityscapes. While there were many historical landmarks, something was needed to give cities a modern, Pakistani and, most importantly, an Islamic identity.

The U.S.-based architectural firm, Leo A. Daly, was hired to design the headquarters of the Habib Bank Limited (HBL) in Karachi. The plaza remained the tallest building in Asia for the

next five years after its construction in 1963 and for seven more years after that in South Asia. The Habib Bank Plaza used fair-face concrete to make the tower viable for Karachi's climate. The traditionally used recessed windows were installed to control sunlight. The façade was designed reflecting the composition of a geometric module, relating it to the history of the region but with a modernist technique. Upon its completion in 1963, the HBL building became a symbol of pride for the entire country and caught the world's attention, presenting a proof of Pakistan's fast-paced economic development and prosperity.

Conclusion

Despite the fact that the U.S. architects were not familiar with our regional and traditional aesthetics, while working in Pakistan, they took decisions very cautiously and also considered the architectural roots of the region. They were given the responsibility to bring innovation to the architectural scenario of the country. They pursued that change by putting traditional materials and architectural features in place with their modernist philosophy. They also used rich landscaping as an essential tool for design. These architects creatively blended modern simplicity and practicality, with the Mughal tradition of using geometric decorative sense and grandeur in buildings. Even while following the traditional approach, they maintained austere simplicity by the use of local, vernacular materials, and straight and simple lines.

Though Pakistani architecture is still in a state of confusion, it often revolves around the fusion of modern and traditional elements. The U.S. architects introduced 'modernism' in Pakistan, focused on function, and made architecture sensitive to the user's needs. They introduced to the Pakistanis the era of extrovert architecture, which set the precedent for the evolution of architecture in the country.

This article argued that the foundation of Pakistani architecture has been a balanced blend of local values with modern aesthetics. It is now our responsibility to learn and rationally develop a design approach to improve the current architectural scenario. There are many interesting possibilities to work out from the experimentations undertaken by the earlier foreign architects. Our article serves as a platter of observations, queries, and concerns for Pakistani architects as to what may be necessary for future designs and what can be left behind.

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[8]. An Architectural style movement by British architects in the late 19th century in British India. It drew elements from native Indo-Islamic and Indian architecture, and combined it with the Gothic revival and Neo-Classical styles favoured in Victorian Britain.
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[10].“International Style” was initiated at a by Hitchcock and Johnson in 1932. The most common characteristics are rectilinear forms, ornamentation-less surfaces, open interior spaces, and cantilever construction.
[11].Liane Lefaivre and Alexander Tzonis, *Architecture of Regionalism in the Age of Globalization: Peaks and Valleys in the Flat World*, (New York: Routledge, 2012), 140, 143.
[12].“Mashrabiya” is a feature of traditional Arabic architecture – a type of projecting oriel window enclosed within carved wood latticework, often lined with stained glass.
[13]. Barbara Lamprecht, “The Obsolescence Of Optimism? Neutra And Alexander’s US Embassy, Karachi, Pakistan,” *Barbaralamprecht.com*, 23 June 2012.
[14].Mumtaz, Architecture in Pakistan, 179.
[15]. “Jali” is an Urdu word for ‘netting’, which is this context means concrete mesh used extensively for architectural decorations in Indian and Islamic architecture. It is a form of perforated stone or latticed screen, usually with an ornamental geometric pattern.
[16].“*Brise-soleil”* is an architectural feature of a building that reduces heat gain within that building by deflecting sunlight.
[17].JB Lehrman, *Earthly Paradise: Garden and Courtyard in Islam*, (Berkeley: University of California Press, 1980), 31.

[18].“Chahar” represents the number four and the word “Bagh” means garden. Hence, “Chaharbagh” involves symmetrical division of a garden into four smaller gardens, often with waterways or pathways.
[19]. Paul Heyer, *Architects on Architecture: New Directions in America* (New York: Allen Lane the Penguin P., 1967), 178, 180.
[20]. Barbara Lamprecht, Obsolescence Of Optimism, *Barbaralamprecht.com*.
[21].Abdul Rehman, Islamabad – *MasterPlanning and Architecture of Dynapolis*(Saarbrücken: Lambert Academic Publishing, 2013), 137.
[22]. Ibid, 138.
[23]. Matthew Stuart Hull, *Government of Paper: The Materiality of Bureaucracy in Urban Pakistan*, (Berkeley: University of California Press, 2012), 43.
[24]. US Embassy for New Delhi Architectural Forum, 1955, 115.
[25]. Stuart Leslie, “Atomic Isolation,” *Newsweekpakistan.com*, February 28 2015, newsweekpakistan.com/atomic-isolation.
[26]. The design philosophy evolves with these three basic techniques. **Spine**: A sequence of large courtyards provides the primary organisational structure, representing the most public realm of the academic campus. **Courtyards**: Clusters of buildings and smaller courtyards comprise the building fabric that defines the spine. **Fingers**: Walkways establish a cross-grain to the organising spine, serving as a connective tissue for the various components of the campus.
[27]. Thomas Payette, “Aga Khan University Faculty of Arts & Sciences Master Plan,” *Payette.com*.