

The Impact of Modernization on the Heritage of Vernacular Houses of Tehran, Iran

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Abstract

Modernization has changed America, Europe, and Islamic countries, including Iran. Tehran, Iran's capital, has experienced rapid population growth and immigration, leading to the devaluation and abandonment of some historical areas. In the Shemiranat region, known for its cultural heritage, unplanned construction has transformed heritage areas into modern, undistinguished residences, causing a loss of intrinsic value.

This study examines the impact of modernization on the cultural heritage residences in the Shemiranat region, focusing on transforming residential facades. By analyzing 11 residential buildings from the Qajar era (1789-1925), the Pahlavi period (1925-1979), and the Islamic Republic period (1979-present), this research highlights the impact of modern culture on the architectural heritage of Shemiranat.

The study employs qualitative methods, including surveys and archival research. Key aspects include identifying the differences between cultural heritage and modern residences and conducting a comparative analysis of selected houses from different periods.

The findings reveal a shift from traditional Persian architecture to modernist influences and a contemporary blend of traditional and modern design. This study underscores the tension between heritage preservation and modernization in Tehran, proposing guidelines for integrating traditional and contemporary architectural practices.

Keywords: Modernization, Shemiranat's Residential Façades, Qajar Period, Pahlavi Period, After The Islamic Revolution.

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Introduction

Traditional cultural residences have long been the most functional spaces in various geographies, reflecting the accumulated experience and lifestyles of human beings over centuries. The advent of the Industrial Revolution brought significant transformations in both production and lifestyle, precipitating an evolution in residential architecture characterized by standardized, cost-effective designs that often eschewed traditional cultural allusions. Aesthetic concerns emerged with various purposes and uses in the interior of architectural products and on the facades that separate interior and exterior spaces. In the urban landscape, building facades play a vital role in enhancing visual quality and aesthetic appeal. Despite their seemingly simple appearance, facades are multifaceted and require careful consideration. As Khatami and Boujari (2022) pointed out, it is essential to account for the various factors and circumstances that impact the evolution of a facade over time. This underscores the importance of a meticulous approach when designing and constructing facades to ensure they remain visually appealing and functional for many years.

Historically, building facades were characterized by unique details such as plain decorations, incongruous additions, colorful surfaces, and complex applications, primarily in structures used for religious, administrative, and educational purposes. Traditional buildings were constructed using natural and climate-compatible materials, whereas modern residential buildings come in various shapes and designs and often feature different materials and facade systems, some of which may not be entirely suitable for their intended purpose. Over time, advancements in technology and architecture have led to significant changes and enhancements in the appearance of houses, particularly their facades. The designs and decorations used on building exteriors have historically conveyed emotions within the limitations of available resources and techniques.

In Tehran's Shemiranat district, houses that have left a cultural trace from the past to the present have been examined in terms of their structure, emphasizing existing facade designs and ornamental features. Elements such as stones, bricks, tiles, and pottery were used as accessories in Tehran houses, referencing Iranian culture throughout the process. However, Shemiranat has seen rapid increases in unplanned and dense construction and the production of modern, anonymous housing, leading to the transformation of heritage areas into modern, unidentified residences. Integrity-oriented compositions in architectural arrangements aim to maintain a connection with the past by considering all elements such as form, proportion, balance, color, size, and harmony. Despite these efforts, the architectural identity of the Shemiranat district has been significantly altered, creating an image of complexity and irregularity. The influence of Western countries like England and America, especially after the Industrial Revolution, has impacted Iranian culture in terms of living spaces and residential layouts. This study seeks to provide a comprehensive analysis of the impact of modernization on the cultural heritage residences in the Shemiranat region, focusing on the transformation of residential facades.

This study aims to explore the impact of modernization on the architectural heritage of Tehran's Shemiranat district. The objectives of the study are:

1. To identify the differences and features between culturally famous houses, belonging to poets and writers, and the facades of famous contemporary houses.
2. To analyze and compare residences with historical value from each of the specified periods (Qajar era, Pahlavi I & II periods, and the post-Islamic Revolution period).
3. To clarify the newly formed architectural style considering the cultural changes in Tehran during these periods.

Theoretical Framework

Modernization Theory

Modernization theory elucidates the process through which societies transition from traditional to modern states through technological advancements, economic growth, and cultural changes. In the context of Tehran, this theory helps to understand:

- Technological Influence: The evolution in construction materials and techniques (Rostow, 1960).
- Economic Factors: Urbanization and the demand for new housing (Lerner, 1958).
- Cultural Shifts: The embrace of Western architectural styles over traditional ones (Inglehart & Baker, 2000).
- Cultural Identity Theory: Cultural identity theory delves into how architecture mirrors and safeguards cultural values and traditions. In the case of Tehran's residences, the theory emphasizes:
 - Traditional Facades: Utilization of indigenous materials and cultural motifs (Rapoport, 1969).
 - Impact of Modernization: Erosion of cultural symbols and identity in contemporary constructions (Oliver, 1989).
 - Preservation Efforts: The significance of integrating traditional elements into modern designs (Lowenthal, 1998).

According to Rapoport (1969), vernacular architecture reflects cultural values and environmental contexts, while modernist influences often lead to a homogenization of design that can undermine local identity. Oliver (1989) further argues that modernization can erode cultural symbols, but there are ways to integrate traditional elements into contemporary designs, as Lowenthal (1998) suggests, to preserve cultural heritage.

Review of Literature

A critical review of previous significant research on the impact of modernization on vernacular and traditional architecture is essential to establish the current knowledge status and identify the gaps. According to Rapoport (1969), vernacular architecture is deeply rooted in the cultural and environmental context, and modernization often disrupts these connections. Oliver (1989) discusses how modernization can lead to the erosion of cultural symbols, emphasizing the need to preserve traditional elements. Lowenthal (1998) highlights the importance of integrating traditional designs into modern architecture to maintain cultural identity.

In the context of Tehran, several studies have examined the impact of modernization. Aghazadeh (2016) explores the reflection of modernization in Iranian architecture, noting the shifts in material and design preferences. For example, Akhgar and Moulis (2021) discuss the legacy of Western architectural education and its influence on Iranian architecture in the twentieth century. Moreover, Alighadr and Haghir (2023) study the evolution of Tehran houses' yards, emphasizing the cultural and environmental factors that have shaped their development. Efradi (2015) analyzes the decorative motifs in Qajar-era buildings, highlighting the cultural significance of these elements. Ghobadian (2015) provides a climatic analysis of sustainable houses in Iran, discussing the balance between traditional and modern design principles. Ghobadian et al. (2022) further analyze the views of traditional architecture masters on contemporary Iranian-Islamic architecture. In contrast, Golkarian (2022) examines the political and geographical aspects of modernization in Iran, providing insights into the broader socio-political context. Kasmayi (1991) and Mohammadzadeye Mehr (2004) focus on the climatic zoning and urban development in Tehran, respectively, offering valuable perspectives on the environmental and urban factors influencing architectural changes. These studies collectively provide a comprehensive understanding of the impact of modernization on vernacular and traditional architecture in Tehran. However, gaps remain in understanding the specific transformations in residential facades and the cultural identity of the Shemiranat district.

History of the Tehran-Shemiranat Region

Tehran is considered the capital of the country as an important region among the 31 provinces (Ostan) of Iran. It is located in the north of the Iranian plateau and covers an area of 18,909 km² (730 km²), (Mahmoodian, 2012). This city was known as a town in 1220 as the most ancient city in, but after the city of Rey, which is located in the south of Tehran today, was destroyed by the Mongols, the majority of the people migrated to the town of Tehran which

is in the middle of the century, it grew into a city. The city of Tehran, which became a center of agriculture, trade, and handicrafts, was surrounded by walls consisting of 114 towers during the reign of the Safavid sultan Shah Tahmasb I (1524-1576). Tehran has grown and developed in terms of functional area and living areas within these walls.

During the reign of Fath Ali Shah Qajar (between 1790 and 1825), a new map was made by Captain Naskov and the perimeter of the city was formed in a rectangular shape as the second wall. Tehran's city walls have witnessed the construction of new structures and spaces. Another place outside the wall was the Shemiranat area. In 1848, The second map of Tehran, Mohammad Shah Qajar period was made by a mapmaker named Berzin, and this map was created as a replica of the Russian and Persian maps. Additional regions are depicted in depth using the tables in this updated map. The bazaar area was also one of the useful areas added by Tehran. The third map of Tehran was made by August Křziř (Austrian) under the direction of Nasireddin Shah Qajar. During this period, Krziz constantly produced new maps, and tables were used to study and characterize various parts of the city. As the city grew, the roles and features of the various departments changed and new structures and places were added. By 1932, Tehran had grown in the area, and with the development, new buildings along with functions were built with the name of the second wall "Naseri Fortress".

The evolving relationship between Iran and Europe has had a notable impact on the social structure of the country. This has resulted in a significant transformation of Iran's intellectual and cultural systems, which has given rise to new ideas and the development of modernist concepts during the reign of Nasir al-Din Shah Qajarian. The outcomes of this movement have been noteworthy, and have had a lasting impact on Iran's cultural and intellectual landscape, as a result, Iranian society was affected by this change (Golkarian, 2022).



Fig. 1: The above painting shows the border of the city of Tehran (Shemiran gate), which was drawn in 1851 by "Voyage en Perse, avec Flandin during the reign of Nasereddin Shah Qajar
Source: Mahmoodian, 2007

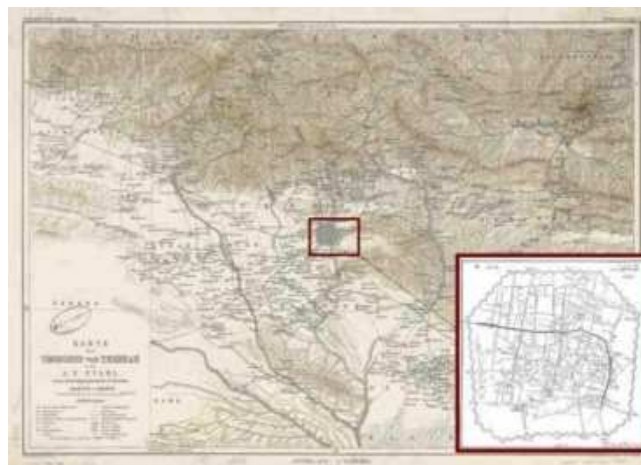


Fig. 2: A map of Tehran drawn by "Alexander Friedrich Stahl" in 1900
Source: Jafari, 2005

Reza Shah Pahlevi started to draw and implement a new city plan for Tehran in 1926. For this reason, a large part of the city walls were destroyed. After World War II, Iran became a major oil exporter. For this reason, with the increase in incomes, the country developed rapidly by becoming a versatile contemporary. During World War II, US President Franklin Roosevelt, British Prime Minister Winston Churchill, and USSR leader Joseph Stalin met at the Tehran Conference (known as the Victory Bridge) on 26 November – 2 December 1943. The development continued until the Iranian Islamic Revolution. However, after the Islamic Republic of Iran, which was established on April 2, 1979, the new administration and revolutionary-ideological system changed the names of any institutions, street names, and parks named after the Shah and his family. Tehran has been popular as a capital since ancient times and especially since the Qajar dynasty. Maintaining its central position after the revolution, it became the focal point of many people from other provinces and was exposed to immigration. As a result, Tehran became the largest city in Iran.



Fig. 3: The map above determines the area of Tehran in 1789-1895, 1941-1951 and shows its development and changes over time passing
Source: Shirazi and Falahat, 2019

Periodic Architectural Characteristics of the Tehran-Shemiranat Region

Tehran-Shemiranat is characterized by a distinctive topography that significantly impacts the region's architecture. For example, if looking at this point as a general subject, the book titled "Climate and Architecture," written by Mahmoud Tavassoli and Kasmayi discusses

the influence of geography and climate on the design of buildings. The book, which was written between 1985 and 1991, highlights the importance of building structures that are suitable for the local climate. Traditional Iranian cities and buildings were constructed by leveraging natural features such as wind and sun, as noted by Ghobadian in 2004.

These traditional architectural features are analyzed based on the climate and then divided into four regions. Traditional architectural products were built using a variety of techniques, with an emphasis on minimizing the negative effects of climate change and maximizing its positive aspects, which can result in unique spatial layouts in architectural plans. (Ghobadian, 2004).

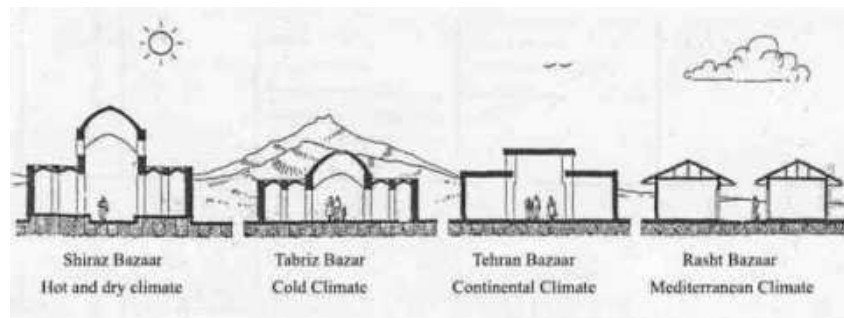


Fig. 4: Iranian traditional buildings are divided into four regions according to their climatic characteristics and they were built according to their climates

Source: Kasmayi, 1991

As it is known, houses are unique environments that contain unique feelings within the framework of the sense of privacy, define the living space, and reflect human civilization.

It is a place that exhibits the worldviews, assumptions, values, ideas, customs, traditions, social balances, and organizational structures of the people residing in houses and other structures.

The place where he developed his culture differently is a place where he embodies it both materially and spiritually. As it was once stated that all houses had these features; however, they took different forms as they were built and were designed to suit the cultures and geographical conditions of each nation. Looking at the traditional architecture of Iran, it is possible to clearly understand the following 5 features:

1. Social and cultural sensitivity (privacy, religion, and other related concerns).
2. The types of materials used to construct the buildings and the use of regional materials.
3. The aesthetic components and usability of the created spaces.
4. Spaces that are both modular and compatible with human scale.
5. Building strong, long-lasting buildings.

The architectural features of Iran are consistent throughout the country's cities, with the most notable being the double-space design of the houses, which provides both indoor and outdoor spaces. When examining interior architecture, it becomes evident that it is rooted in ancient times.

The reason is that one of the most important aspects of Iranian residential culture is that it was designed to accommodate a reclusive lifestyle.

Three basic components make up the architecture of introverted (Deruni) types. Personal safety, respect for privacy, and consideration of climatic conditions are some of these qualities. One of the most sensitive issues is the protection of privacy.

As a result, the "Enderun" or "Enderuni" section developed as a residential area. According to tradition, the inner rooms of a house are reserved for the family and its members,

referred to as Deruni or Enderuni. The area known as the garden and courtyard forms the second part of the house. Women, children, men, and visitors are usually welcomed here.

The "Biruni" (outer) half of the space is considered the exterior of the house (Alighadr & Haghir, 2023).



Fig. 5: Picture from the interior of the Moghadam Residence
Source: Onur and Golkarian, 2021

Partitions known as the veranda (iwan) are among the most important components of traditional Iranian home design. The iwan is the common area that provides communication between adjacent rooms and group meetings (Soltan Zadeh, 2013).

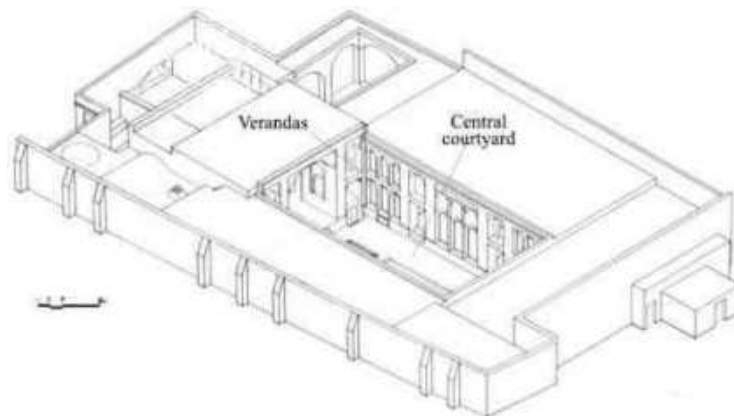


Fig. 6: Rooms and verandas inside the traditional house
Source: Pirnia, 2005

Each residence is comprised of a defined area, which includes the rooms and inner courtyard that the owner and their guests can use. However, foreigners were only allowed to meet outside the front door, which is located at the furthest part of the residence. Gender discrimination is also present with separate seating provided for men and women. Summer and winter houses, known as Tabestan Neshin and Zemestan Neshin, have rooms available for visitors and residents to sit in. Women's rooms are usually located near the kitchen. Houses facing the inner courtyard are often adorned with intricate decorations on their facades, while those facing the street are designed to be as plain as possible and surrounded by high walls to remain hidden.

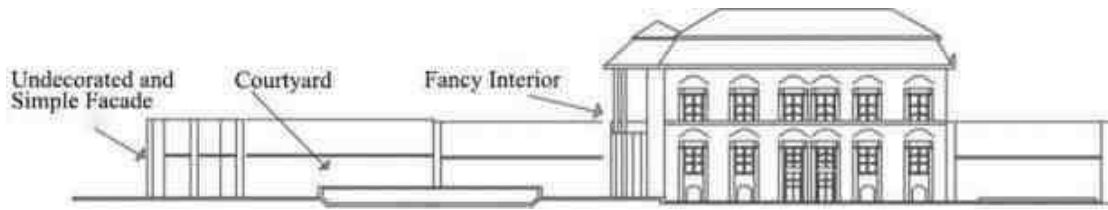


Fig. 7: Drawing showing the ornamented facade of the Pirnia residence facing the inner courtyard, and the plain facade facing the street

Source: Author

The materials used for constructing houses in Iran vary depending on the region due to the geographical features of the cities. Cut stones such as baked mudbrick and brick, as well as rubble stones, are commonly utilized for wall construction. Brick houses have been considered desirable properties for a long time (Mahmoodian, 2009). Wood is another popular building material and is used to construct wooden structures, interior dividers, door and window fittings, and even walls. Many houses combine both stone and wood. Gypsum is usually the primary material for interior walls, while wood materials and occasionally polished plaster are used for exterior walls (Mahmoodian, 2007).

Table 1: Building materials, building elements, and architectural styles of residences in Iran shaped according to the period

Source: Author

1	Process of Changes	First Qajar Period	Second Qajar Period	Third Qajar Period	First Pahlavi Period	Second Pahlavi Period	Islamic Revolution
2	Arch-Style	Esfahan Style	Tehran Style (Modernism)	Neoclassical	Western Style	Western Style	Postmodern
3	Materials	Brick, Wood, Stone, Adobe, Clay, and Mosaic	Brick, Wood, Stone, Adobe, Clay, Mosaic, Plaster, and Steel	Brick, Wood, Stone, Adobe, Clay, Mosaic, Reinforce Concrete, Cement, Plaster	Brick, Wood, Stone, Adobe, Clay, Mosaic, Reinforce Concrete, Cement, Plaster	Brick, Wood, Stone, Adobe, Clay, Mosaic, Reinforce Concrete, Cement, Plaster, Glass, and Steel	Brick, Wood, Stone, Adobe, Clay, Mosaic, Reinforce Concrete, Cement, Plaster, glass and Steel, Double glazing glass, Baroque and Greece Ornaments

Characteristics of Qajar Period Residences

In Tehran, the types of houses built vary based on climate and locally available materials. The design of a house with an inner courtyard and pool can indicate the owner's social and economic status. The size of the land and the width of the house also have financial implications for the homeowner. The number of floors and rooms in a building also varies based on the owner's financial strength. Single-story houses are often occupied by those with low economic income, while middle and lower Hatat levels typically have features seen in typical Tehran houses. Single-story houses in Tehran can have one or two rooms, a teahouse, and a courtyard.

Despite this, Tehran houses often have elaborate exterior and interior architecture (Behpour, 2009).



Fig. 8: The Teahouse on the ground floor Shown in pink on the plan
Source: Author

During the Qajar period, most of Tehran's traditional residences were constructed as two-story buildings, as shown in Figure 10. Generally, these two-story dwellings belonged to middle-class and wealthy families. To access the teahouse, you would need to pass through another door, which is located on the mezzanine floor. The design of the teahouse was influenced by the width of the land and the other rooms in the house. Additionally, some houses have an external staircase that leads to the top floor teahouse.



Fig. 9: Sheikh Khazel (Hazel) Residence
Source: Author

It is noteworthy that the residential architecture of the Safavid period is similar to the residential architecture of the Qajarian period. During the Nasir-Eddin Shah period, art also advanced due to the development of industry. In addition, as a result of contact with Western countries, the plan types of Iranian residences began to change. The main feature of Qajarian architecture is imitation. Villa-type buildings are the places where this feature is seen the most. In this period, the European style is widely preferred. It follows that the ostentatious houses and villas owned by the wealthy are copies of the Baroque style.

As a result, it is clear that the Iranian Baroque style also developed and emerged from the buildings built in this period. The intricate carving on the stones and the ornamental rose and flower patterns on the luxurious pillars combined with plaster, the variety and types of designs, and the vibrant coloring are evident in the individual residences of the wealthy at that

time. Applications on the columns show that the value of architectural elements is recognized (Sami, 1996).

The use of mirrors, design, and glass ornaments, the combination of the lion symbol, sea nymphs, and inlaid plaster columns symbolize life in Iranian art while showing the use of artistic aspects and the use of art in homes.

Features of Pahlavi period residences: (1925-1979)

During the reign of Reza Shah Pahlavi, romanticism began to be used as an architectural style and became more prominent, especially in public and official buildings. Pre-Islamic architecture was one of the two main features of this period, with the use of Persian (Pasargad) architecture in some of its important architectural achievements. Most of Tehran's buildings from this period resemble Achaemenid construction (Zabihi, 2010).



Fig. 10: Shahrbanu Palace; Architectural style of Reza Shah Pahlavi period
Source: Author

Centralist thoughts, an innovation that breaks traditions as taboo, and modern thought and modernism in architecture, the benefits of the technique emerged in the same century as the gift of the twentieth year. The state structure of the Shah period easily adapted to this. In this context, we can list the differences and features as follows:

1. Often the bottom of the building is higher than the ground. The entrances of the buildings are ostentatious and the entrances take place in the middle of the building. These features emphasize the scheme and grandeur of the building.
2. Ceilings at entrances are usually high. These structures immediately stand out as examples of German architecture of the early 20th century due to their high columns and their length. However, the synthesis is also complemented by ancient Iranian history and architecture. After all, the architecture displays the same sense of majesty and authority as Iranian culture.
3. Many structures in the Reza Shah era contained vertical and linear signs and components.

Especially the design and construction of columns and windows give the buildings of this period a sense of grandeur and majesty, and in fact, all these aspects were used as symbolic motifs. The structure in question was built horizontally and is too big and bulky to be lifted, (Mohammadzadeye Mehr, 2004). It is undeniable that many of the important architects of the Pahlavi period went to Western countries and were inspired by the architectural works there. the education of Iranian architects in France and the presence of European architecture teachers at the Academy of Arts; It emerged as a means of movement of phaetons and cars, which created a special style in Qajar architecture; and Russian and Armenian architects influenced the construction of Western-style buildings. Using Western architecture as an example, they began to change house plans, which led to the construction of more contemporary houses as opposed to their older, more traditional counterparts (Ghobadian, 2021).



Fig. 11: Pahlavi Palace, Shapuri Palace, and Saad' Abad Palace
Source: Author

These architectural features and effects, which continued until the period of Mohammed Reza Shah Pahlavi (1941-1979), started to be built in the form of apartments, and the architectural style of Western countries led to the formation of the new Tehran. New Tehran was created as a result of these architectural influences, which continued under the rule of Mohammad Reza Shah Pahlavi (1941–1979), first appearing as apartments. Some other factors, such as modernism, foreign relations, and the presence of Westerners in Iran and sending students abroad, have greater effects on private buildings than in the previous period. Some new factors that did not contribute to Qajarian architecture, such as the emergence of the middle class, the presence of European architects, and the great availability of new building materials, also influenced the architectural style in the early Pahlavi era (Akhgar & Moulis, 2021).

1. The walls bearing the weight of the building are taken into account.
2. Flat/ Terrace roof application.
3. Application of Terraces or Balcony.
4. Consideration of windows opening to the courtyard and the street.
5. Use of large windows throughout.



Fig. 12: Mohammad Reza Shah Pahlavi Period, Dr. Shariyet's Residence
Source: Author

During this era, the traditional architectural styles became outdated and were replaced with a new way of life and design. Architects began using more suitable forms to fit the current conditions and this change is evident in the architecture of Tehran. This shift in architecture has also led to a search for a new cultural identity within society (Schulz, 2000).

Iranian Islamic Republic Revolution (1979 - After): Contemporary Architecture Features of Post-revolutionary Modern Architecture Implemented in Tehran:

1. Historical styles, which are the basis of architectural forms and designs, are rejected.
2. There has been a reduction in building decorations.

3. Architectural shapes are simplified and avoid too complex details
4. Glass, steel, or reinforced concrete construction methods have become widespread in building construction.

The interior and exterior areas of the building were renovated with modernist styles, (1909 Millais). During the specified timeframe, the prevalent utilization of facade materials and paint entailed varying shades of white and gray. As an example, the BM7 Residence structure, designed by Bahram Kalantarini of Arad Company, exhibits a facade that seamlessly integrates a combination of white and black tones.



Fig. 13: BM7 Residential Apartment
Source: Aghazadeh, 2016

The collision of human identity and contemporary living spaces is a recurrent source of conflict. If there is no harmony between the old identity and the modern style, people's living spaces begin to become alienated and both their identity concerns and their trust in their environment begin to surface. This tension between traditional and modern design can create an overall feeling of discomfort. In response, modern architecture strives to meet evolving needs by creating new living spaces that can lead individuals to adopt new identities. As a result of the preference for contemporary architecture to create new living spaces that will meet the changing needs of people, the members of society gain new identities. The elements that the social individual values most are identity and culture. So every adjustment affects these two important attributes. Any irresponsibility and inconsistency will always have negative consequences (Ghobadian, 2004).

Relationship between Facades and Cultural Identity

Building facades serve as more than mere structural elements; they function as visual narrators of cultural identity, encapsulating the values, traditions, and aesthetic sensibilities of a given society. In urban centers such as Tehran, the evolution of facades over time manifests as a narrative of cultural shifts and societal transformations.

Traditional Facades: A Reflection of Cultural Heritage

In Tehran, traditional facades feature intricate designs and are fashioned from natural materials such as stone, brick, and wood. These facades frequently integrate cultural motifs and decorative elements that are distinct to Iranian heritage. Notably, traditional Persian architectural elements such as muqarnas (stalactite vaulting), haft rangi (seven-color tilework), and ornate stucco work are prevalent in historical edifices. These designs surpass mere ornamentation; they symbolize varied cultural narratives and serve as expressions of artistic identity.

1. Values and Traditions: The utilization of natural materials and traditional methodologies reflects a reverence for nature and a dedication to craftsmanship

that has been transmitted across generations. The intricate designs frequently carry symbolic meanings, signifying themes from Persian literature, religion, and mythology.

2. **Aesthetics:** The allure of traditional facades lies in their intricacy and meticulousness. These facades are meticulously crafted to evoke a sense of harmony and equilibrium, often mirroring the philosophical and artistic principles of Persian culture.

- **Modern Facades: The Influence of Globalization and Modernization**

Modern facades in Tehran, shaped by globalization and rapid modernization, often lack the cultural allusions that typify traditional designs. These facades are typically more streamlined and functional, prioritizing minimalism and efficiency over decorative complexity.

1. **Loss of Identity and Continuity:** Modernization, at the turn of the 20th century, has caused major transformations in the vernacular architecture, (Widiastuti, 2019). With modern buildings supplanting traditional ones, the distinctive cultural markers ingrained in traditional facades are forfeited. This engenders a form of architectural homogenization, wherein buildings begin to resemble one another, irrespective of their geographical or cultural context. The visual language that once tethered inhabitants to their history and cultural origins becomes diluted.
2. **The shift in Cultural Values:** The transition from traditional to modern facades signals a broader shift in cultural values. There exists a trend toward embracing global architectural paradigms that emphasize functionality, cost-efficiency, and modern aesthetics. This transition reflects alterations in societal priorities, such as the demand for increased housing, technological integration, and contemporary lifestyle preferences.
3. **Impact on Sense of Place and Community:** The facade of a building plays a pivotal role in shaping the character of a neighborhood and fostering a sense of place. Traditional facades contribute to a cohesive community identity, providing residents with a shared link to their heritage. Modern facades, featuring generic and impersonal designs, have the potential to erode this sense of place. As historical structures are replaced or overshadowed by modern edifices, the visual and emotional ties to the past weaken, impacting community cohesion and the collective memory of the area.

Research Methodology

This study employs a qualitative research methodology to explore the impact of modernization on the heritage residential facades in Tehran's Shemiranat region. The qualitative approach is chosen to capture the intricate details and contextual nuances that quantitative methods may overlook. The research is designed to provide an in-depth understanding of the changes in architectural styles and cultural identities over different historical periods.

Data Collection Techniques

Archival Research:

- **Description:** Archival research involves the systematic study of historical records and documents to gather information about the architectural styles and cultural contexts of different periods.
- **Implementation:** Historical records, maps, photographs, and architectural plans from libraries, museums, and online databases were examined. This provided a comprehensive background on the Qajar era, the Pahlavi period, and the post-Islamic Revolution period.

Objective: To understand the historical evolution of residential facades and the socio-cultural factors influencing these changes.

Surveys:

- Description: Surveys were conducted to gather insights from residents regarding their perceptions of modernization and its impact on heritage architecture.

Objective: To collect subjective data on how modernization is perceived and its impact on the architectural heritage of the region.

Field Observations:

- Description: Field observations involve the direct examination of the physical characteristics and conditions of residential facades in the Shemiranat region.
- Implementation: Site visits were conducted to 11 residential buildings representing different historical periods (the Qajar era, the Pahlavi period, and the Islamic Republic period). However, due to the lack of accessibility to all these houses without municipality permission, it had been limited to live visiting. Detailed notes and photographs were taken from the library sources.

Objective: To observe and record the current state of heritage buildings and the extent of modern interventions.

To ensure the reliability and validity of the research following is accomplished:

- Triangulation: Data from multiple sources (archival records, surveys, field observations) were triangulated to cross-verify findings.

By detailing the research methodology, this study aims to provide a transparent and replicable approach that other researchers can follow to verify the findings and contribute to the ongoing discourse on the impact of modernization on cultural heritage in Tehran.

Findings and Discussion

As a result of the research, the famous cultural residences in the Shemiranat region were evaluated by comparing their features with 11 residences. All 11 houses belonging to Qajar, Pahlavi, and contemporary architecture were compared according to their facade features and building characteristics. According to the analysis, the buildings with brick façades belonging to the Qajar period were unornamented until the mid-1800s and 1800s but turned into ornamented façades in the mid-1850s-1900. For example; The house of Sheykh Khazael and Rahnema has an unornamented façade, while the façades of Kiyanian and Alizadeh house have motifs. At the same time, until the middle of 1800 and 1800, residencies consisted of verandas, small windows, and a symmetrical facade, but in the middle of 1850 -1900, the opposite construction style started to change. On the other hand, in the Pahlavi period, Stonework residencies until 1941-1950 had hipped roofs and large windows and verandas. After 1950, hipped roofs gave their place to terrace roofs, and windows started to be smaller and became without a veranda, although houses had windows this action allowed the interior area to be completely separated from the outside area. This rapid change was not limited only to the dimensions of the veranda, roof, and window, but also completely changed the perception and meaning of privacy.

After the Islamic revolution, that is, in the full modernization period of Iran, there was a transition from detached courtyard houses or double-story private residential buildings with courtyards to the construction of apartments. The advantages and disadvantages brought by this periodical transition are clearly visible on the facades. When looking at modern houses from an aesthetic point of view, it can be seen that the use of brick, wood, and stone materials adds different designs and attractiveness to the building facades, but it is clearly seen that the change in window sizes and the arrangement of the apartments are disadvantageous in terms of privacy. When it comes to privacy, two out of every four houses (Sharifi and Ilkhani) are advantageous, while the other two (Caveh and BM7) are disadvantaged. Many residences built in the modern era have asymmetrical floor plans that can be seen and reflected on the façade, such as Caveh and BM7 residences.

Table 2: Comparisons of brick facade houses of the Qajar period in terms of decoration Source: Golkarian, 2017


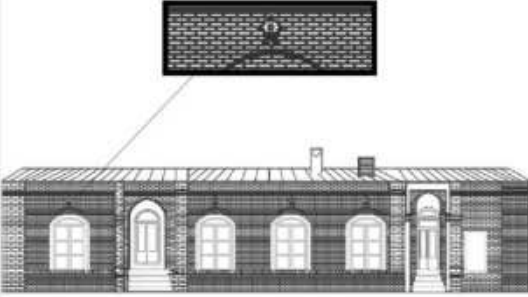
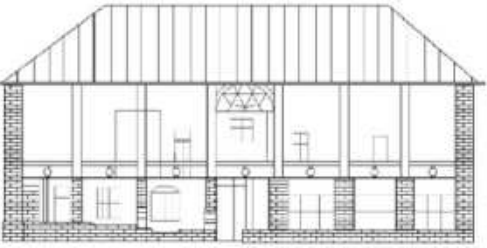
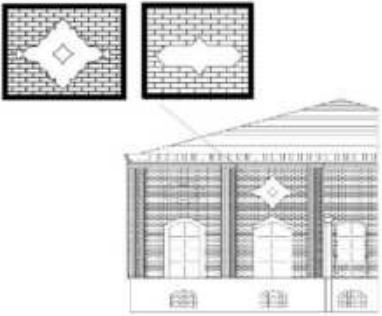
The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)							
Brick-Faced Houses from the Qajarian Period							
General Features							
Name	Sheikh Khazael House (01)	Name	Rahnema House (02)	Name	Alizadeh House (03)	Name	Kiyanian House (04)
Address	Iran- Tehran, Qods Square, at the crossroads of Darband street and fanakhosro street	Address	Iran- Tehran, Niavaran, Martyr Bahonar street, Lowards Tajrish Junction and next to Yasser Junction, Ahang impass street.	Address	Iran- Tehran, Africah highway, Modarres Highway junction, Gulnar street, block 5.	Address	Iran- Tehran, In the North district, Dr. To the left of Shahriyar street, across Yakhchal street, Blok 11.
Cadastral Status	No 10849 Parcel 1	Cadastral Status	No 9281 Parcel 4	Cadastral Status	No 85 Parcel 3	Cadastral Status	No 10765 Parcel 6
Construction Date	1868	Construction Date	1892	Construction Date	1900	Construction Date	1883
Without Ornaments				With Ornaments			
 <p>Sheykh Khazael House (01)</p>				 <p>Alizadeh House (03)</p>			
 <p>Rahnema House (02)</p>				 <p>Kiyanian House (04)</p>			

Table 3: Comparison of the brick façade houses of the Qajar period in terms of symmetry and asymmetry Source: Golkarian, 2017


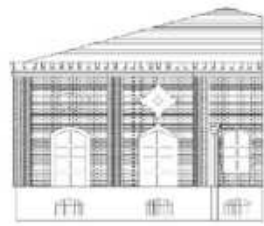



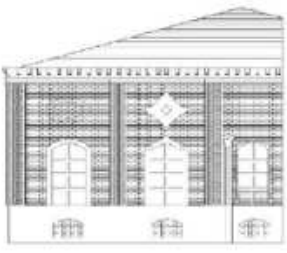
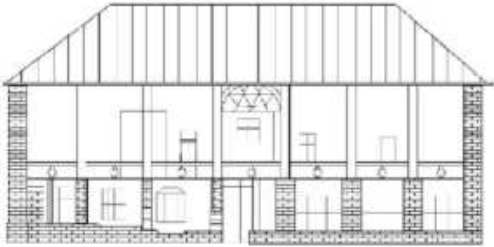

The Evolution of Tehran Houses' Façade From the Qajarian Period till Nowadays (Shemiranat District)							
Brick-Faced Houses from the Qajarian Period							
General Features							
Name	Sheikh Khazael House (01)	Name	Rahnema House (02)	Name	Alizadeh House (03)	Name	Kiyanian House (04)
Address	Iran- Tehran, Qods Square, at the crossroads of Darband street and farakhosro street	Address	Iran- Tehran, Niavaran, Martyr Bahonar street,towards Tajrish Junction and next to Yasser Junction, Ahang impass street.	Address	Iran- Tehran, Africah highway, Modarres Highway junction,Gulnar street, block 5.	Address	Iran- Tehran, In the North district, Dr. To the left of Shahriyar street, across Yakhchal street, Blok 11.
Cadastral Status	No 10849 Parcel 1	Cadastral Status	No 9281 Parcel 4	Cadastral Status	No 85 Parcel 3	Cadastral Status	No 10765 Parcel 6
Construction Date	1868	Construction Date	1892	Construction Date	1900	Construction Date	1883.
Symmetry				Asymmetry			
							
Sheykh Khazael House (01)				Kiyanian House (04)			
							
Rahnema House (02)				Alizadeh House (03)			

Table 4: Comparisons of houses with brick facades of the Qajar period in terms of verandas Source: Golkarian, 2017

The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)							
Brick-Faced Houses from the Qajarian Period							
General Features							
Name	Sheikh Khazael House (01)	Name	Rahnema House (02)	Name	Alizadeh House (03)	Name	Kiyanian House (04)
Address	Iran- Tehran, Qods Square, at the crossroads of Darband street and fanakhosro street	Address	Iran- Tehran, Niavaran, Martyr Bahonar street, towards Tajrish Junction and next to Yasser Junction, Ahang impasse street.	Address	Iran- Tehran, Africah highway, Modares Highway junction, Gulnar street, block 5.	Address	Iran- Tehran, In the North district, Dr. To the left of Shahriyar street, across Yakhchal street, Block 11.
Cadastral Status	No 10849 Parcel 1	Cadastral Status	No 9281 Parcel 4	Cadastral Status	No 85 Parcel 3	Cadastral Status	No 10765 Parcel 6
Construction Date	1868	Construction Date	1892	Construction Date	1900	Construction Date	1883
With Veranda				Without Veranda			
 <p>Sheikh Khazael House (01)</p>				 <p>Kiyanian House (04)</p>			
 <p>Rahnema House (02)</p>				 <p>Alizadeh House (03)</p>			

The unornamented facade of Sheikh Khazael House typifies Qajar period architecture, characterized by the use of natural materials and symmetrical design that exemplify traditional construction practices, underscoring the era's rich cultural heritage. The Rahnema House includes small windows and a veranda, typical features in Qajar period residences. The absence of ornamental designs highlights the structural functionality of the architecture while preserving

its cultural significance. Alizadeh House, with ornamental motifs and a symmetrical facade, exemplifies the evolving architectural styles of the mid-1800s. The incorporation of decorative elements signifies a transition towards more elaborate designs during the Qajar period. Once a museum, Kiyaniyan House illustrates the integration of cultural motifs in its facade. The ornamental features and use of traditional materials are a testament to the preservation of cultural heritage in its architectural design.

Table 5: Comparisons of houses with brick facades of the Pahlavi period in terms of roofs Source: Golkarian, 2017








The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)					
Brick-Faced Houses from the Pahlavi Period					
General Features					
Name	Nima Youshij House (05)		Name	Shaeran House (06)	
Address	Iran- Tehran, Shemiranat district, Tajrish square, Ramadan street.		Address	Iran- Tehran, Shemiranat district, State street, Martyr kolahdouz street, Nemeti street, block 1.	
Cadastral Status	No 4603	Parcel 3	Cadastral Status	No 1845	Parcel 1
Construction Date	1950		Construction Date	1941	
Name	Jalale Al Ahmad & Daneshvar House (07)		Name	Jalale Al Ahmad & Daneshvar House (07)	
Address	Iran- Tehran, shemiranat district, Shariati street, Shahid baraduan Vaezi street, Bijan Smalli street, block 16.		Address	Iran- Tehran, shemiranat district, Shariati street, Shahid baraduan Vaezi street, Bijan Smalli street, block 16.	
Cadastral Status	No 11466	Parcel 3	Cadastral Status	No 11466	Parcel 3
Construction Date	1953		Construction Date	1953	
Terrace Roof			Hip Roof		
 <p>Shaeran House (06)</p>			 <p>Shaeran House (06)</p>		
 <p>Jalale Al Ahmad & Daneshvar House (07)</p>			 <p>Nima Youshij House (05)</p>		

Table 6: Comparisons of houses with brick facades of the Pahlavi period in terms of verandas Source: Golkarian, 2017

The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)					
Brick-Faced Houses from the Pahlavi Period					
General Features					
Name	Nima Youshij House (05)		Name	Shaeran House (06)	
Address	Iran- Tehran, Shamiranat district, Tajrish square, Ramadan street.		Address	Iran- Tehran, Shemiranat district, State street, Maetyr kolahdouz street, Nemeti street, block 1.	
Cadastral Status	No 4603	Parcel 3	Cadastral Status	No 1845	Parcel 1
Construction Date	1950		Construction Date	1941	
Name			Name	Jalale Al Ahmad & Daneshvar House (07)	
Address			Address	Iran- Tehran, shemiranat district, Shariati street, Shahid baradaran Vaezi street, Bijan Small street, block 16.	
Cadastral Status	No 11466	Parcel 3	Cadastral Status	No 11466	Parcel 3
Construction Date	1953		Construction Date	1953	
With Veranda			Without Veranda		
 <p>Shaeran House (06)</p>			 <p>Jalale Al Ahmad & Daneshvar House (07)</p>		
 <p>Nima Youshij House (05)</p>					

Pahlavi Period Residences are made usually with stonework and hipped roofs, representing the early Pahlavi period. The large windows and veranda indicate a blend of traditional and modern elements, highlighting the transitional phase in architectural styles.

Table 7: Comparisons of Contemporary houses with Modern construction facades in terms of materials
Source: Golkarian, 2017


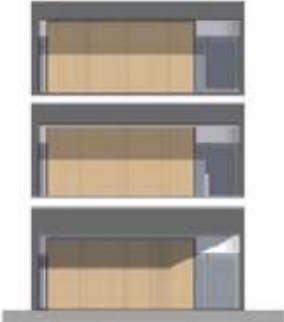
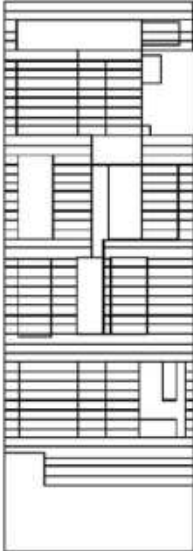

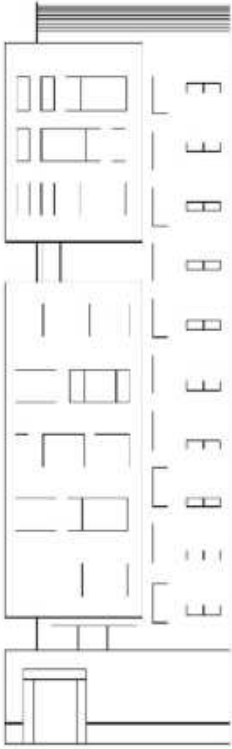

The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)			
Contemporary Houses with Modern Construction Facades			
General Features			
Name BM7 house (08)	Name Kaveh house (09)	Name Ilkhani house (10)	Name Sharifi house (11)
Address Iran- Tehran, Shemiranat District, Niavaran, North Kamraniye, Tajiki street, block 7.	Address Iran- Tehran, Shemiranat District, Gbeyrati street, Front of the Caveh Boulevard.	Address Iran- Tehran, Shemiranat District, Zafaraniye, Ordi beheshte Gharbgi street, Pasiyan avenue, 4th house, Block 6.	Address Iran- Tehran, Shemiranat District, Mirdamad Bos levard, Shariyati street, Sharifi Avenue, Block 3.
Cadastral Status No - Parcel 8	Cadastral Status No 6864 - Parcel 7	Cadastral Status No - Parcel 4	Cadastral Status No - Parcel 9
Construction Date 2015	Construction Date 2013	Construction Date 2014	Construction Date 2014
Brick and stonwork		Wooden and Stonework	
 <p style="text-align: center;">Caveh House (09)</p>		 <p style="text-align: center;">Sharifi House (11)</p>	
	 <p style="text-align: center;">Ilkhani House (10)</p>		 <p style="text-align: center;">Bm7 House (08)</p>

Table 8: Comparisons of Contemporary houses with modern construction facades in terms of privacy
Source: Golkarian, 2017

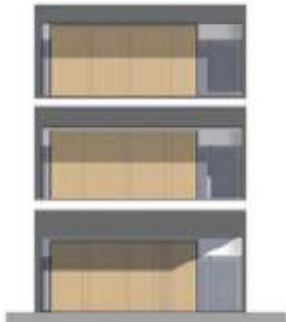

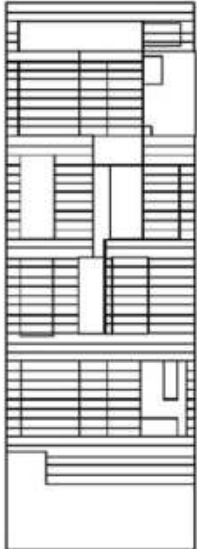

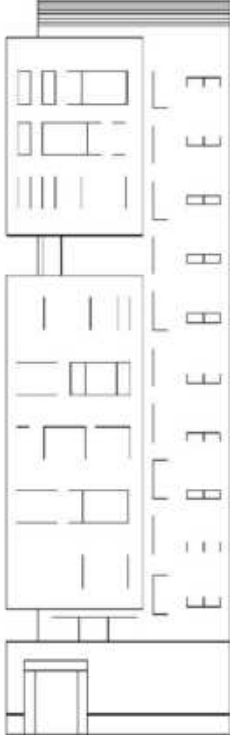

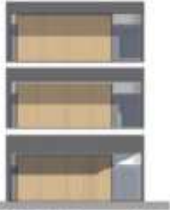
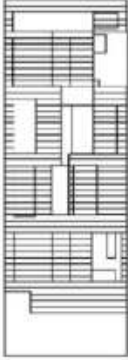

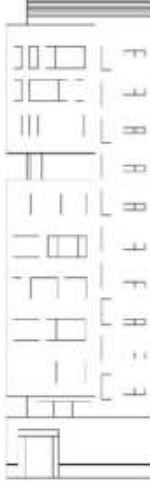


The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)							
Contemporary Houses with Modern Construction Facades							
General Features							
Name	BM7 house (08)	Name	Kaveh house (09)	Name	Ilkhani house (10)	Name	Sharifi house (11)
Address	Iran- Tehran, Shemiranat District, Niavaran, North Kamraniye, Tajiki street, block 7.	Address	Iran- Tehran, Shemiranat District, Ghayrati street, Front of the Caveh Boulevard.	Address	Iran- Tehran, Shemiranat District, Zafaraniye, Ordi beheshte Gharbi street, Pasiyan avenue, 4th house, Block 6.	Address	Iran- Tehran, Shemiranat District, Mirdamad Bou levard, Shariyati street, Sharifi Avenue, Block 3.
Cadastral Status	No - Parcel 8	Cadastral Status	No 6864 Parcel 7	Cadastral Status	No - Parcel 4	Cadastral Status	No - Parcel 9
Construction Date	2015	Construction Date	2013	Construction Date	2014	Construction Date	2014
With Privacy (Window)				Without Privacy (Window)			
 <p>Sharifi House (11)</p>				 <p>Caveh House (09)</p>			
		 <p>Ilkhani House (10)</p>				 <p>BM7 House (08)</p>	

Table 9: Comparisons of Contemporary houses with modern construction facades in terms of Symmetry and Asymmetry
Source: Golkarian, 2017

The Evolution of Tehran Houses' Facade From the Qajarian Period till Nowadays (Shemiranat District)							
Contemporary Houses with Modern Construction Facades							
General Features							
Name	BM7 house (08)	Name	Kaveh house (09)	Name	Ilkhani house (10)	Name	Sharifi house (11)
Address	Iran- Tehran, Shemiranat District, Niavaran, North Kamraniye, Tajiki street, block 7.	Address	Iran- Tehran, Shemiranat District, Gheyrafi street, Front of the Caveh Boulevard.	Address	Iran- Tehran, Shemiranat District, Zafaraniye, Ordi beheshte Gharbgi street, Pasiyan avenue, 4th house, Block 6.	Address	Iran- Tehran, Shemiranat District, Mirdamad Boulevard, Shariyati street, Sharifi Avenue, Block 3.
Cadastral Status	No - Parcel 8	Cadastral Status	No 6864 Parcel 7	Cadastral Status	No - Parcel 4	Cadastral Status	No - Parcel 9
Construction Date	2015	Construction Date	2013	Construction Date	2014	Construction Date	2014
Asymmetry				Symmetry			
 <p>Sharifi House (11)</p>   <p>Ilkhani House (10)</p>   <p>BM7 House (08)</p>				 <p>Caveh House (09)</p>			

The contemporary housing structure exhibits a terrace roof, reduced window dimensions, and an absence of verandas, all of which highlight the influence of modernization. The employment of contemporary materials and an asymmetrical design embodies present-day architectural tendencies, with a focus on functionality superseding cultural heritage.

Conclusions

Throughout various historical periods specifically (Qajar, Pahlavi, and post-Revolution) periods, the city of Tehran has undergone significant changes, necessitating the adaptation and development of its structures. The materials used in buildings both on the facade and on the facades have changed over time, such as building materials, window dimensions, roof shapes, designs, decorations, and entrances have all been altered to reflect differences between buildings and climate characteristics. This study has investigated the significant impacts of modernization on the architectural heritage of Tehran's Shemiranat district, specifically focusing on residential facades. The findings reveal several key changes and their respective impacts:

1. **Material Usage:** There has been a shift from traditional materials like brick and stone to modern materials such as concrete and glass. This change has resulted in the loss of traditional craftsmanship and the distinct aesthetic qualities of vernacular architecture.
2. **Facade Design:** Traditional symmetrical facades with intricate ornamentation have been replaced by asymmetrical, minimalist designs. While modern designs offer functional advantages, they lack the cultural and historical references that were once prominent.
3. **Privacy and Social Interaction:** The transition from courtyard houses to apartment buildings has significantly impacted social interactions and privacy. Traditional houses promoted community interactions and ensured privacy, whereas modern apartments often lacked these features.
4. **Cultural Identity:** The blending of architectural styles has diluted the cultural identity of the region. The unique Persian architectural elements that once defined the character of Tehran's residential areas are being overshadowed by global architectural trends.
5. **Environmental Adaptation:** Traditional houses were well-adapted to the local climate, utilizing natural ventilation and shading. Modern buildings, however, often rely on mechanical systems, leading to higher energy consumption and less environmentally sustainable practices.

Strengths of this Research:

- Provides a comprehensive historical analysis of architectural changes in Tehran.
- Highlights the socio-cultural impacts of architectural modernization.
- Offers insights into the balance between modernization and heritage preservation.

Weaknesses of this Research:

- Limited by the accessibility of some historical residences.
- Relies heavily on qualitative data, which may introduce subjective biases.

This study demonstrates the need for urban planners and architects to develop strategies that integrate modern amenities with the preservation of cultural heritage. Upon revisiting the aims and objectives, it is clear that the research has successfully identified the major impacts of modernization and provided a detailed analysis of the resulting changes in Tehran's residential architecture.

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