

Embedded heritage: the role of information and communication technology (ICT) in urban placemaking (case study: Tehran's citadel)

Abstract

As young, active, creative, and authentic people tend to outmigration from the historical contexts of downtown Tehran, the question in this paper has dealt with the ways of place-making through ICT. Hence, the article seeks to find an urban design solution to attract people to the inner parts of the cities. The primary purpose of this study is to enhance public events in the historic zone of Tehran's Citadel by using ICT. In spite of the potentials of the heritage areas in empowering social interactions and nightlife entertainments, many of the historic urban spaces have now fallen into disrepair and decrepitude. The importance of this research is in recreating the morphological, economic, social and historical aspects of vast and sensitive areas in Tehran and other similar cities. Therefore, by studying the evolution of urban fabrics in three historical periods, the physical, social, and historic-cultural features of these periods have been studied and assessed through 3D modeling and fabrication. Volumetric envelopes of historic monuments, some of which are now destroyed, are to be made and virtually displayed in the original location of the buildings by using lighting techniques. The result of this paper indicates that in addition to its instrumental role of digital documentation production, ICT may enhance historical urban sites and aid people in three main place aspects including the functional aspect (enhancing safety, nightlife, and social interaction), the perceptual aspect (enhancing the identity of the place) and the physical aspect (redesigning urban places).

Keywords: augmented reality, urban place-making, gentrification, information and communication technology, historical citadel of Tehran, heritage area, social interaction, nightlife

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Abbreviations: ICT, information and communication technology

Introduction

About twenty years ago, when the population of Tehran did not exceed two million, a well-known author wrote in a press:

*"For nearly twenty years, Tehran has swallowed up one and a half million young and active people and has resolved them like an aqua regia. That is, the five hundred thousand ordinary populations, mostly old or children, reaches two million young, active, and energetic people, and it has four times the population. In the meantime, neither its revenues have quadrupled nor its wheat, supplies, and livelihood. What are these two million people doing in Tehran? In the beginning, ask anyone the question he/she will answers that work day and night. They work all day, in the morning in one place, evening elsewhere, and they even work at night. For this reason, this person misses all stages of humanity. He/she has no fun. He/she is unaware of the fate of his wife and child during the day. He/she does not get the chance to meet friends and acquaintances. Even if his neighbor dies, he won't know who. As when he dies, no one will ask who he was."*¹

This short picture of Tehran today can be seen differently. Tehran has become a dream and hope city for many people, especially the youth. How vast and crowded a city that once had only a few streets, buildings, and some gates were closed to strangers at night. Where the gardens are and how it became just a city for cars. Tehran is a center of cultural and social changes in various historical periods. What initially engages every researcher's mind is how having been the process of these developments in Tehran? And how has that thought influenced

the body of the city? How can information and communications technology be aimed at protecting the identity of the city's historical context cause place-making? The purpose of this article is to study the course of physical developments and Tehran's urban landscape in the three periods of Safavid, Qajar, and today's Tehran and finally how it relates to information technology and its tools using for place-making in urban space.

Information and communication technology (ICT) and place-making: The term Place-making, which came into use in the 1970s, describes the process of creating spaces, normally within the cities, that attract people because of their pleasurable or interesting quality. But it more deals with places, not design. Therefore, understanding the most significant community values, including social, historical, physical and natural aspects, plays a crucial role to have a powerful vision for making the place.²² More like the sense of place, it characterizes the relation between people and spatial setting. Information and communication technology (ICT) and the use of digital technologies to represent real-world environments have been employed in place-making trends.²³ Social media elements such as municipal Wi-Fi, interactive public displays, media facades as well as smartphones applications have been used in different domains including culture and arts, education, planning and design, games and entertainment.² Location is defined as particular point on the earth's a surface, which is a locally identifiable location in which human values have formed and grown in that context. Built environments are a complex network of diverse relationships that occur not only between individuals but also between individuals and the environment. When the relationship between man and the environment is based on human experience, the environment becomes a place. This relationship means that location is part of the environmental experience, along with the convergence

of the cognitions, influences, and behaviors of the people living with them. Places are combinations of natural and human order and principal centers of our immediate businesses from the universe. Places are not abstractions or concepts, but they are phenomena directly experienced, and so they are full of meanings, real objects, and current activities.³

It is so difficult to understand why a place is successful, and how to build on that success. While location meanings are rooted in physical characteristics and related activities, but they do not shape those physical properties, human experiences and ideas that shape the features of the place.⁴ Various scholars have offered views on place-making. Their general theories are consistent with the three main components of the place that includes physical features, activities, and environmental meanings.⁵⁻⁷ An article titled Conservation and Urban History, in Line with Kevin Lynch's Suggestion of Choosing the Past to Build the Future, studies the political, historical, and cultural background of ethnic minorities and women in Los Angeles. The aim was to create a "theory of place" that can provide historical research on topics and thereby create a new agenda for the preservation of history, public art, and urban design. The economic development has helped determine the choice of buildings and sites to study. Since economic development defined in terms of production (but not regular consumption) the essential core of the city emerged as the center. These sources include oral history and also written and visual documents. The research results are summarized in a map showing multi-ethnic economic history in Los Angeles downtown, and make suggestions for historic preservation and urban design.⁸

In 2014, Lozano Hammer in Abu Dhabi using light in the urban space to make people more attendance. People participated by holding a sensor located in the center of the Plaza, whose electronic activity made their heart unique lighting. The direction of the lights determines different biometric rhythms that visualize each participant on an urban scale, and it transformed public space into urban space that included light and movement. And finally, its space is designed with continuous and personal participation to create a private and intimate experience of the light in the Plaza.⁹

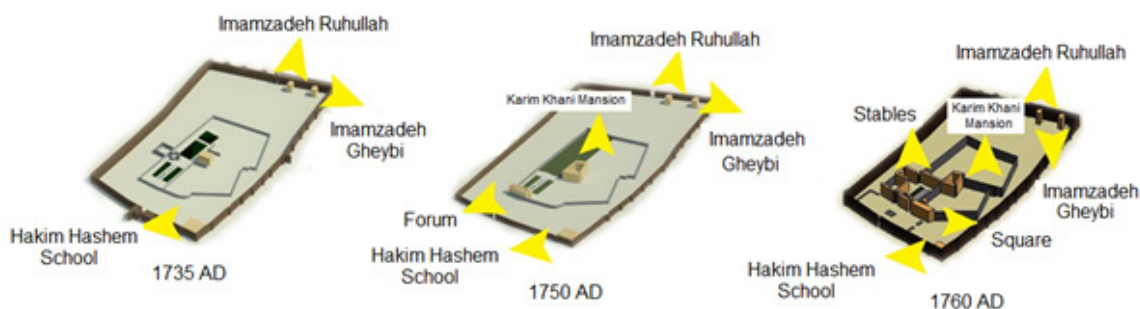
Case study: Tehran's citadel: Most historians agree that because Tehran is located on Ray Road, a political, administrative, and commercial center, it was subjected to looting. The bandits plundered the convoys that crossed this road. King Tahmasp Safavid and his family went to visit Abdul Azim more often, so in 1564 AD he made Tehran a secure base and ordered it to heavily fortify Tehran. There were four fortified gateways, namely Abdul Azim, Shemiran, Qazvin and Dolab gates. To provide the fortification structure the excavation happened in two particular districts, one of which was later known as

the Chaleh Meidan, and the other was Chaleh Hesar.¹ The defensive walls surrounded four main districts, and King Tahmasp's sister built several public buildings, such as a school, a bathroom, and a Tekye in residential areas. After the Afghan invasion, a defensive wall was added with two gates to protect Arg (citadel) district, in the north, later called the Dolat Gate, and one was in the south.⁹ During the period of Karim Khan Zand, Tehran received more attention, and on his orders, an edifice was built in Arg. Then Aqa Mohammad Khan Qajar was crowned in Tehran in 1786. The expansion of Tehran began with the reign of Nassereddin Shah in 1848. Due to the growing population inevitably, he destroyed king Tahmasp's fence, and the location of the gates was moved to a new site, and the city had twelve gates. Tehran remained the same until the late Reza Shah's era, with only some of its fences, towers, and gates destroyed. During Reza Shah, Tehran expanded to four sides, and finally, in the 1970s, Tehran and Shemiran came together, and the present Tehran emerged.¹⁰

Tehran's Arg landscape and social-cultural developments in different historical periods

Pre-Safavid era: In the pre-Safavid era, people were building their houses underground, according to the tradition of Ray. It was done for two reasons, the severe heat of Tehran and the defense against the enemy. The city also had many gardens and vast fields, and the hordes of trees prevented the enemy from passing. It also has a large number of holy shrines. The gathering place of the people of Tehran was in the neighborhoods before the fence was built. It is clear from the literature that the moral character of the people of Tehran at that time was not proper. In most historical books, they were called outlaws. Even people from different neighborhoods were at war with each other.

Safavid era: Notable features of urban planning in the Safavid era can be named the texture of the city to the urban green field and the creation of vast squares. Another critical aspect of this time was the attention of the urban psyche and direction. The expansion of Safavid cities was based on a comprehensive plan, and its features are the non-destruction of the old fabric of the cities.¹¹ During the Safavid reign of Shah Tahmasp, he settled in Tehran for a time and fenced around it, where his sister built a bath, a school, and a Tekye. His sister built a charity where the Safavids were interested in development and prosperity. They also provided a place for relatives and themselves, like the four gardens (in the royal citadel) of which one of their construction activities was in Tehran. Other elements of that period include the congregational mosque. One of the urban features of the Safavid era is introversion that is rooted in Islamic culture and even the culture of Islamic Iran. This feature creates public indoor space. As a result, the walls and the yard walls were tall and nothing was visible from the outside.¹¹ (Map 1)



Map 1 Volumetric Envelopes in the Safavid era.

Qajar era: Although Tehran was the capital of the country during the Qajar era, it never had the grandeur, glory, facilities, and equipment that were appropriate for a capital.¹² With the onset of modernization in Iran, the shape and structure of Iranian urban structures changed. During the reign of Nasser al-Din Shah, the expansion of Tehran began.¹³ During the fifty years of Nasser al-Din Shah's rule, it was considered a period of rapid physical growth in which new urban spaces were built.¹⁴ Aqa Mohammad Khan Qajar chose Arg as his seat of government. The south side of it became Nasser Street (Nassarkhsro) at the time of Nasser al-Din Shah. On the north side was the desert where the artillery field and the cemetery were located. They built a high wall around it, and the Shah Mosque was built there. Later other monuments such as the royal mansion, the big forum, a garden next to the forum, the royal mansion, the office of governor, seraglio, and the backyard in 1760. The mansion is a big house and a garden was built next to it. The porch of the marble bed is also one of the oldest buildings in Tehran, built by Aqa Mohammad Khan Qajar. Another citadel mansion built by Fath Ali Shah is the Golestan Garden, which is attached to the pergola on one side. The windmill was also built at the same time on the south side of Golestan Garden. The mansions of Cheshmeh, Sun, Eshrat-e Ayn, shrine, pearl ball, school and mosque of Hakim Shah were built by the government. The mansion began at the time of Agha Mohammad Khan and ended at the time of Fath Ali Shah.¹⁰

Chardin expresses well the customs and culture of Iran in the Safavid period. In his opinion, poetry and literature is one aspect of culture. Chardin states:

*Poetry is one of the intrinsic arts of Iranians and they all have these characteristics. Iranians find themselves at festivals and gatherings and at any time of their leisure, happy to listen to the poetic and heart-wrenching poetry of their great poets.*¹⁵

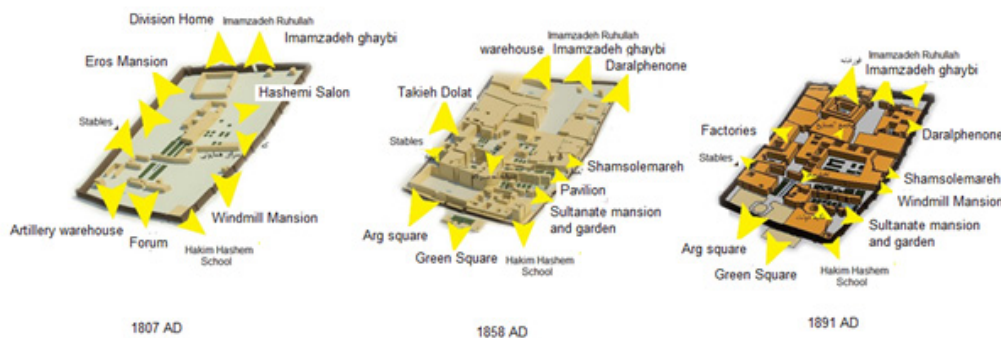
At that time, however, Tehran was not culturally significant. For example, of 955, the culture of the country as a writer and poet was only 1 percent in Tehran. But it was destined to focus on cultural activities in the city as well as the political center of the country, in line with the growth of Tehran. One of the important activities of this period, which was undertaken by Shah Zaman in Tehran, was the establishment of the Daralphenone school, a step that Nasser al-Din Shah took after his trip to the Ottomans and became familiar with their education. Later, Daralphenone had a library, a printing house and a photographic site. In the pre-constitutional period, lectures were also held for ordinary people in the school hall to inform the public. Amir Kabir also undertook another activity, the establishment of an assembly of tradesmen, in which masters could train their professions to construct objects. In addition, after the trip to Europe by Nasser al-

Din Shah, elements such as the Museum, a newspaper, were created that had important cultural and social impacts on society.¹⁶

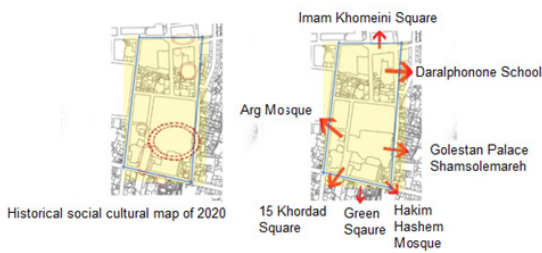
In those days, all the necessities of life for the people were provided by manual workshops or workshops that used animals or physical labor for young workers instead of electricity and machines.¹ On the other hand, social activities of that era were limited to prayer, rosary, welcoming and chanting for pilgrimage trips, Friday prayers in the Shah Mosque and preaching, and later speeches to ordinary people. Wedding parties and weddings, drinks, and singing were also held in neighborhood units or residential homes. People also gathered around the Shah mosque for religious testimonies and such religious ceremonies, holding magnificent ceremonies and then dispersing. Government officials went to the Italian Embassy for their party and stayed there until nightfall.¹⁷ It should be noted that the preaching and Ta'ziyah were not solely because of religion, but they were secondary. It was necessary to provide entertainment for the people because the public was deprived of all places. The general policy of the government was to rely on the pretense of religion and the overthrow of the religious scholars to the kings.¹⁶ (Map 2)

Modern Tehran: We are observing major changes in the urban landscape in modern Tehran. It is worth noting that the main changes have occurred in the urban context of Tehran during this period, that was the main reason, and its start was when the car arrived in the city. The car changed the scale of the city. Downtown buildings, crowded narrow streets on a human scale, and neighborhood centers disappeared.¹⁸ Some of the monuments that triggered events, such as relying on government and the gates that represent the city's historic identity have been removed or altered. However, within the citadel still there are historical physical elements, which are identifiable as milestones, and the intertwining of markets with the addition of historical and cultural value, have also attracted tourists.¹⁹ (Map 3)

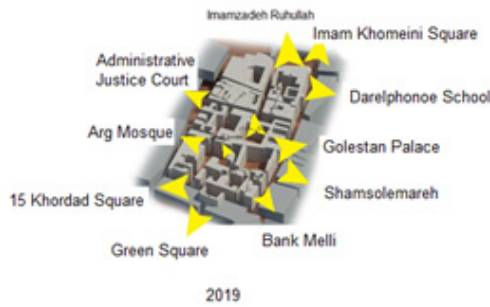
The historical context is the manifestation of civilization and depicts events that took place over time. These events convey memories registered in the minds of citizens, and spaces create places for social activities and the culture and customs of those places are reflected. The importance of these areas is not only due to their architectural structure but also to the events that shaped them and symbolized the culture and history of a community. Remains of the past still attract the attention of citizens and tourists not only from Iran but from all over the world. Historical events can shape and sustain communities. The remnants of Arg in Tehran are the beating heart of the city and the place for social and cultural activities that bring together different people. The diversity of people in this place is due to the different cultures that originated from it.^{20,21} (Map 4)



Map 2 Volumetric Envelopes in the Qajar era.



Map 3 Historical Areas and current situation of Arg area in Tehran.



Map 4 Volumetric Envelopes in modern Tehran.

Research methodology

This paper comprises a historical approach and the investigation of the transformations within the historical body. Therefore, a documentary-based descriptive method has been applied to scrutinize the corresponding works and analyze the obtained results. This paper aims to study the historical, social, cultural, and physical transformations during three eras, including Safavid, Qajar, and present-day Tehran. The library research and field study were employed; at last, the transformation path plans have been provided by the authors and illustrated in volume envelopes.

Conceptual model of research

In the historical context of a place, socio-cultural events do exist during a particular period. In the body context, whatever happened in that specific place can be very important. During a historical era, each event occurs due to the culture and tradition specific for the society, which leads to the miscellaneous social phenomena; hence, in such places, considering culture and tradition, the context planning and design cause the occurrence of the events and social collaboration, in the absence of a historical place or a specific era. According to the physical, functional, and perceptual properties, this planning and design could be developed in a particular place; moreover, information technology can play an instrumental role to provide digital documents to improving the urban heritage. (Figure 1)

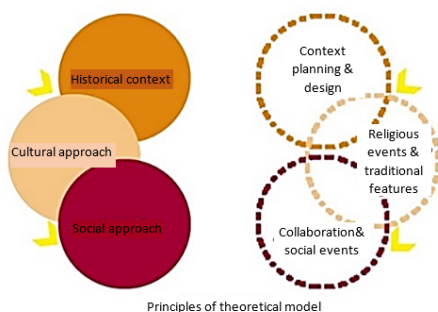
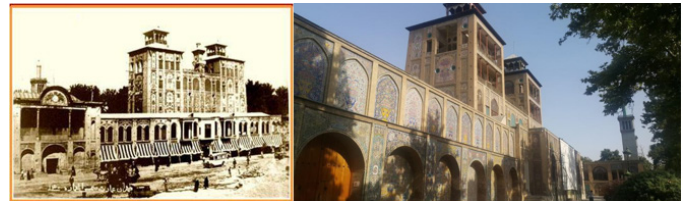


Figure 1 The principles of the conceptual model.

Summary

It is important to examine the social and cultural structure in each period. Collected and analyzed on social and cultural issues from the books of old Tehran by Jafar Shahri in five volumes, Reports of Tehran Law in Two Volumes and Statistics of Dar al-Khalafeh of Tehran are briefly stated. Culture in that time should be interpreted most commonly. Public awareness of what is happening around, the role of education in this field is very important because of the construction of schools and mosques. The community has also existed in the past, not as it is today, but with small communities around the corner and more often can be part of it in different periods. (All Findings & Table 1)

Elements of Arg in three periods in Tehran.



Shamsolemarah in modern Tehran Shamsolemarah in The Qajar era!



Golestan palace in modern Tehran Golestan palace in Qajar era!



15th Khordad Street in modern Tehran Arg street in the Qajar era!



Arg mosque in modern Tehran Hakim Hashem mosque in modern Tehran.



Topkhaneh square in modern Tehran Topkhaneh square in the Qajar era!



Daralphenone School in modern Tehran Daralphenone School in the Qajar era!



Picture of Imamzadeh Ruhollah in modern Tehran.

Conclusion

Investigating the Tehran citadel because of its uniqueness historically is a desirable arena for displaying the three physical, semantic, and activity components. This research examines different historical periods and extracts physical characteristics and the

landscape of historic buildings in the Tehran citadel and eventually converting them into bulk envelopes that you can see the volume of buildings in the former place that has been removed from space today. Depicting historic destroyed sites, enhance activity in the environment through the presence of people, promote nightlife in spaces that are completely silent at night, and ultimately, it improves the safety of the Tehran citadel. Also, due to the historical characteristics of the area with the improvement of historical aspects, and according to the historical events that have existed in the buildings over time, meanings reproduce in people's minds, and the identity can be enhanced there. On the other hand, considering space to bring people together, we will see the organization of the body for the presence of people in that historic place. (Table 2)

In conclusion, the present paper argued that in addition to its marked role and production of digital documentations, it corroborated civil, historical places and helped people in three main aspects, including functional with a social approach (by strengthening security, nightlife, and social interactions), conceptual with cultural approach (protecting the identity of the place), and physical with considering the historical background (organizing civil places).

Table 1 Investigated elements of three historical periods

Raw	Site	Historical era	Description
1	Tekye Dolat	Safavid	In king Tahmasb's time, there were 3 Tekye at the citadel. According to the reports of the police, one of those Tekyes (king's) is in place of the Tekye dolat.
		Qajar	It was initially rectangular and to the left of the citadel. After Nassereddin Shah's trip to London formed. They had arches, the tallest of which was dedicated to the king. It was located southeast of the Golestan Palace and southwest of Shams al-Amara, north of the square and opposite the Shah Mosque.
		Today	Today, according to the impressions made, this reliance does not exist and it called a street and a part of it is a shop and Bank melli.
2	Golestan palace	Safavid	The foundation of Golestan palace in the reign of Shah Abbas Safavid in the year 1590, and with the construction of four gardens he returns inside the fence of Shah Tahmasb's fence.
		Qajar	The palace underwent changes in Nasser al-Din Shah as the first monarch to visit Europe. After they destroyed the Almasiyah building, they built the Golestan Hall (Mirror Hall) and the Museum Hall instead. Before that, there were forty columns in the Hall of Kolah Farangi.
		Today	Now the same is available.
3	Shams al-amarah	Safavid	This place didn't exist.
		Qajar	After Nassereddin Shah's visit to Europe, two delegations of French and Austrian engineers were invited to Iran to design the mansions that Shah Qajar had seen in Farang. Shams al-Amara was one of the same skyscrapers designed by them.
		Today	Shams al-Amara has attracted many Iranians and even tourists, and has a five-story building.
4	Golshan Garden	Safavid	This place didn't exist.
		Qajar	This garden was added to the Golestan Palace at the time of Fath Ali Shah.
		Today	The garden was demolished at the behest of Pahlavi I and is now the entrance door to the Golestan Palace.
5	Bagh-e shah (king's garden)	Safavid	This place didn't exist.
		Qajar	It was formed in the time of Fath-Ali Shah and became the capital of Nasser al-Din Shah. In the middle of the garden there was a large pond arranged between it (the pond) of the full-fledged island. In part of the garden there was a tower-like structure called the Landscape. At that time, a statue of Nasser al-Din Shah was also built in a statue graveyard and placed in a garden.
		Today	During the reign of Reza Shah, Mashq became a square. Today it is known as the National Garden.
6	Arg square	Safavid	This square did not exist in the time of Shah Tahmasb Safavid, because it was after the defeat of the Afghans by King Sultan Hussein that they built bridges and opposite it was a gate bridge which they named the Gate Citadel.
		Qajar	There is a field in the south of the citadel that was built at the time of Zandiyeh.
		Today	After moving its balls to the new home ball field, it became the Gulshan Garden. Today is the entrance to Golestan Palace and 15 Khordad Square.

Table Continued...

Raw	Site	Historical era	Description
7	Sabze meydan (Green square)	Safavid	Branch Square is Tehran's first square. The field was used for the sale of vegetables, fruits and vegetables. For this reason, it was later named Branch Square.
		Qajar	As it turned out, Branch Square was the gathering place for Tehran crystal sellers, but as a result of the boom it found, merchants began to open more shops there on the Jebhe-e-Khoz (Republic Boulevard).
		Today	Branch Square is adjacent to Tehran's Grand Bazaar and the main entrance to the market.
8	Hakim Hashen mosque	Safavid	It was founded in the Safavid period by its founder, Hakim Hashim. This monument is located to the southeast of the historic citadel of the citadel
		Qajar	During this period, he continued his religious and educational activities.
		Today	Today the mosque is a monument and is still in operation, but the eastern and southern parts of the mosque have been damaged.
9	King's Masque	Safavid	This place didn't exist.
		Qajar	The founder of this mosque was Mahdeolia the wife of Mohammad Shah Qajar and the mother of Nasser al-Din Shah.
		Today	Today the mosque has been renamed Imam and has been renovated but continues to operate.
10	Arg Masque	Safavid	This place didn't exist.
		Qajar	It was formed during this period and was formed during the time of Nasser al-Din Shah, called the Mosque of the Office. After the Qajar period, the ruins and its land became part of government land.
		Today	At the suggestion of Ayatollah Boroujerdi, the same land was set aside for the construction of the current citadel of the citadel.
11	Daralphenone School	Safavid	This place didn't exist.
		Qajar	One of the most important things at the beginning of Nasser al-Din Shah's reign in Tehran was the establishment of the Daralphenone School. Daralphenone founding thought originated from the great thoughts of Amir Kabir. The school is located on a vast land on the north side of Nasser al-Din Shah residence in the citadel.
15	Imamzadeh Ruhullah	Today	It has become a museum and a tourist destination today.
19	Sun's bed (takht-e khorshid)	Safavid	On the east side of Bob Homayoun Street. This Imamzadeh is considered the son of Imam Musa Kazem.
		Qajar	This place didn't exist.
		Today	It was built by Fath Ali Shah. Today it has become the Ministry of Finance.
22	Artillery Square	Safavid	Today it has become the Ministry of Finance.
		Qajar	This place didn't exist.
		Today	It was built in the north of the citadel at the time of Nasser al-Din Shah. The two floors were designed to accommodate gunners in order to sample cavalry cannons. ¹⁸
		Today	It has been renamed Imam Khomeini Square.

Table 2

Organizing civil places	Historical context and background	Planning and designing the context	Physical
Protecting the identity of place	Cultural approach	Religious events and traditional features	Conceptual
Improving security, nightlife, social interactions	Social approach	Social events and participations	Functional

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Conflicts of interest

There is no conflict of interest.

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