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Article

Urban design in a historic context: Evaluation of the renovation project of Sahibabad Meydan in Tabriz

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ABSTRACT

The present study aims to evaluate the renovation of Sahibabad Meydan which is part of a large-scale urban project designed to reorganise the traditional commercial axis of Tabriz. The project has been stalled for more than a decade as the implemented first phase encountered a serious financial failure. The renovation of historic sites has become an important task in Iranian cities that experienced a dramatic urban change over the past century. The present study highlights the importance of Urban Morphology in designing historic contexts in contemporary Iranian cities. The urban transformation of Tabriz is analysed at the city level to understand the impacts of the modernisation movement. The analytical method of Space Syntax is used to illustrate how the spatial quality of historic Sahibabad Meydan has been changed. It is revealed that the modern streets have become powerful urban elements that affect the performance of Sahibabad Meydan. Two hypotheses are considered for the future of the renovation project. Daraie Street plays a significant role in this sense as it makes a considerable impact on the visibility, accessibility, and centrality of Sahibabad Meydan. The correlation of Visual Integration and Clustering Coefficient measures reveals that the meydan will be a successful public space only if Daraie Street is closed. The present study underlines the significance of urban morphological analyses in the changing historic context. Providing the opportunity for a comparative study, Space Syntax contributes to the prediction of the future performance of an urban project.

Cite this article as: Soleimani M. Urban design in a historic context: Evaluation of the renovation project of Sahibabad Meydan in Tabriz. Megaron 2022;17(3):424–436.

INTRODUCTION

Designing in the historic context has been a controversial issue in the urban design practice. The historic core is often the main socio-economic center of contemporary cities that is subjected to continuous restoration and improvement. In Iran, some large-scale rehabilitation and renovation projects were planned in the 1990s. "Restructuring the Historic Silk Road of Tabriz" was one of them that aimed to reorganise the traditional commercial axis. The renovation of Sahibabad Meydan was a significant part of this large project. It has been stalled when the first phase, including two bridge-markets and a new shopping centre, financially failed. As Sahibabad Meydan required more than 70 existing shops to be expropriated, the risk was too high. It is not the first time that the reconstruction of a historic

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site in Iran has failed to meet expectations. An endless desire to make a profit has resulted in the building of huge multi-storey shopping malls along with the renovation of historic elements. It mostly happens without considering the transformed urban structure of contemporary Iranian cities. The present study argues that historic urban element like Sahibabad Meydan needs to be evaluated in the new context. The glorious past performance of the meydan cannot guarantee future success.

After the occupation of Iran by Mongols, Tabriz became the capital of Iran in 1273. Located on the ancient Silk Road, the city was already an important trading center, including multiple caravanserais, public buildings, and urban facilities (Hanachi & Nejad, 2006). By Uzun Hasan, the founder of Aq Qoyunlus government (1469–1501), Tabriz experienced an extensive urban development. The traditionally covered bazaar was extended over Aji Chay River, and a governmental complex including palaces, commercial buildings, and public facilities was organized around a square named Sahibabad Meydan. When the capital was transferred from Tabriz in the 16th century, the meydan lost its significant administrative importance. It started to get smaller in size and acted as a trading meydan thanks to its location on the commercial axis. With the construction of new streets like Daraie, Sahibabad Complex was broken and the meydan was occupied by small shops. It has totally disappeared since the 1950s.

The renovation of Sahibabad Meydan could be a valuable attempt to revive a historic urban space with political, religious and socio-economic functions. However, ignoring the new urban structure of Tabriz and the profit-oriented approach in the designing process has prevented the project to be successful. The present study aims to analyze the reasons behind the failure of Sahibabad Meydan project. How different a traditional meydan may act in the new urban structure; or how effective the new street network can be on the performance of the historic urban space?

THE THEORETICAL FRAMEWORK

The historic urban fabric, in which the past of a city is written, narrates the story of people who inhabited, experienced and changed a setting to accommodate their needs (Kropf, 1996). In the urban conservation debates, the main questions have always been why, what and how to protect. Steinberg presents five aspects of rehabilitation in developing countries as political, economic, cultural, social, and urbanization issues (Steinberg, 1996). There is a need for strong policies and efficient organizations to support conservation activities politically and financially. In Iran, the legislative base and operational instruments for the area-based conservation and renovation of historic sites were founded in the 1990s. The changing socio-cultural structure of historic areas is another issue that should be

considered to protect low-income people against the impact of gentrification. The old cities, particularly in the Middle Eastern countries, have considerable tourism potential due to their ancient cultural values (Steinberg, 1996). Instead of investing in their representation, the wrong approach has resulted in the misuse and misinterpretation of Iranian historic sites. After the renovation projects, the low-income residents and small businesses are often replaced with luxury shopping centres, many of which are empty.

To make better decisions for historic sites, appropriate knowledge of the urban form is substantial. The urban form has been studied from various geographical, socio-cultural and architectural points of view. Although the term "urban morphology" has been used since the late 1950s, studies of urban spaces go back to the turn of the 20th century (Bilsel, 2015). Camillo Sitte (1889) was one of the first persons who drew attention to the artistic characteristics of historic places, particularly European plazas. His architectural perspective is still relevant as some concepts like "the line of traffic", "the degree of enclosure", "the experience by movement" and "the line of sight" have been applied in the development of a computational analytic method called Space Syntax.

Urban morphological analyses are done based on the three principles of form, resolution (scale) and time (Conzen, 1960). The scale ranges from the whole city to the block level. In urban design projects, city-level analysis is hardly used in the design process. The pre-design phase generally starts by presenting the formal evolution of a city. Then, the scale shifts on the block level to focus on the considered historic site. However, the impacts of the whole city on the particular urban element remain unattended. Mahmoud Tavassoli (1990) was among the key scholars who studied the urban structure of traditional Iranian cities. He properly analyzed the spatial characteristics of historic urban elements such as meydan and bazaar. However, the applied methods are insufficient to deal with the radical transformation of Iranian cities that destroyed the morphological logic of spaces. To overcome this problem, the computational approach has been widely applied in urban form studies for the last three decades.

Space syntax argues that a direct connection has existed between the spatial organization of a city and the pattern of urban activities (Hillier & Hanson, 1984). It was broadly used to analyze the changing urban structure of Iranian cities after the modernization started in the early 20th century (Karimi, 1998). In the design process of public spaces such as Trafalgar Square, Millennium Bridge and Nottingham Old Market Square, Space Syntax was also applied (Karimi, 2012). For the designers, the main contribution was the ability of Space Syntax to predict pedestrian movement and the visibility of elements. The findings strengthened the theory of "natural movement" that refers to "attraction

inequalities" by which some urban spaces are preferred over others (Turner & Penn, 2002). It helps to determine functionally successful urban spaces as more movement attracts more commercial and public facilities. The present study applies Space Syntax to understand how the changing urban structure of Tabriz affects the potential of Sahibabad Meydan to attract people.

Space syntax provides the opportunity for a comparative study between the different states of the same context. Its models, produced by a computer program, illustrate the values of accessibility and visibility that are recognized as the important features of successful public spaces (Turner & Penn, 2002). Sahibabad Meydan is analyzed in this sense to make comparisons between its traditional form, the current and its future post-renovation states. Being aware of the performance of a project can largely prevent unexpected problems. Without understanding the processes that have produced and transformed the city, "attempts to manage or enhance the built urban environment would be like trying to steer a ship without a rudder" (Barke, 2018). Urban morphology provides the knowledge to understand how a city works. Space Syntax illustrates how urban space is affected by transformations. In the present study, the renovation of a traditional meydan is evaluated by the methods that are rarely used in the Iranian context.

Although space syntax relatively contributes to eliminate the complexities of urban spaces, it has several deficiencies. The reductionist approach of computation to explain the multi-layered socio-spatial phenomena is often criticized (Turner, 2003). The reduction of urban experience to the action of movement, the reduction of public activities to physical presence, and the reduction of the built environment to the syntactic features discards the three-dimensional character of the environment. The land use pattern, cultural preconceptions and climate features are the other factors that are not taken to account in Space Syntax (Netto, 2015). There is a need for other methods to be used along with the computational analysis to be assured that the findings are reliable.

METHODOLOGY OF THE STUDY

The present research is a case study that aims to evaluate the renovation project of Sahibabad Meydan in Tabriz. For a historic site in a changing context, urban morphology is an appropriate method. It is defined as "the systematic study of the form, shape, plan, structure and functions of the built fabric of towns and cities, and of the origin and the way in which this fabric has evolved over time" (Gauthiez, 2004). The morphological analyses of Tabriz are done based on the three principles of form, resolution (scale) and time. The old maps and the historical data are provided from librarian sources. Three periods are determined the traditional (pre-modernization) period, the current time

(based on 2013's Comprehensive Plan of Tabriz) and the future (after the renovation of meydan). The main urban axes are determined based on morphological analyses at the city level. Sahibabad Meydan was located on the traditional commercial axis which has been destroyed by the modern streets. A hypothesis is that Sahibabad Meydan will not show the performance it had in the past. To test the hypothesis, there is a need to make a comparison between the traditional meydan and its renovated state in the modernized city. Space Syntax provides the techniques for analyzing the relation between the spatial configuration and the patterns of human activity (Hillier & Hanson, 1984). It provides the opportunity to conduct a comparative study.

UCL Depth map 10th Edition program, the software package of Space Syntax, is used in the present study to conduct the analyses. At the city level, a square with a side length of 3 km is used to fit the whole traditional map of Tabriz. By the Axial Map analysis, integration, accessibility and centrality of Sahibabad Meydan are evaluated in relation to the changing urban structure of the city. Graphical models and numerical values are prepared to make exact comparisons between the three models representing the old, current and future states of Tabriz. In the block level, a square with a side length of 500 meters is used to focus on Sahibabad Meydan and its surroundings. The Visual Graph analysis is applied on this scale to create the visibility pattern of the project. The correlation between the measures of Visual Integration and Visual Clustering Coefficient makes it possible to identify the areas with high visibility that simultaneously have the potential for social activities. The present study reveals the significance of morphological analyses in the pre-design phase of urban projects particularly when an intervention needs to be done in a historic context. The applied methodology can be used in other contexts without concerning the stylistic differences. In order to compensate for the deficiencies of quantitative analyses, it is recommended to conduct field studies along with Space Syntax to have more reliable findings.

THE TRADITIONAL SAHIBABAD MEYDAN

Regarding its etymology, meydan originates from Urdu and Persian languages and consists of two parts: "mey" and "dan". In Persian, "dan" is a suffix used to indicate a place of something. For instance, the word Goldan as the place of Gol (flower) means "vase". In traditional Iranian cities, meydan was an open space located at the intersection of passages or in front of public buildings (Soltanzade, 1990). Meydan could exist with no articulated boundaries that are common in European plazas or Roman Forum. In this term, "meydan" in Islamic Iranian cities has a different meaning from similar terms like "square" or "plaza". In the particular urban structure of Iranian traditional cities, a meydan made strong spatial relationships with other elements to become

a place of gathering for socio-economic activities. The word "meydan" is used in the present paper as the case study is from Iran.

Unfortunately, there is little information available about the buildings and the overall urban structure of Tabriz before the 18th century. The lack of written documents, destructive wars and catastrophic earthquakes make it very difficult to study the urban form of the city. Prepared by the Russian army, the 1827's map is the oldest technical map of Tabriz in which the main elements without considerable details can be seen. Drawn by Colonel Qarajeh-Dagi, the 1880's map includes detailed information about buildings and urban spaces that is a reliable source for studying. These documents are used to prepare the traditional map of Tabriz and Sahibabad Meydan before the modernization. The historic Tabriz presented a typical Islamic model with its main urban elements such as Jame Mosque, the covered bazaar, neighborhoods, the castle and the city wall. The Jame Mosque was formed near the covered bazaar in the city center to which the main streets reached from the gateways (Figure 1).

Urban morphology reveals the main urban elements to understand how a city works on different scales. The various functional layers of traditional Tabriz are prepared and superimposed on the city level by the square with a side length of 3 km (Figure 2). This morphological analysis contributes to find the main urban axes which present the structure of the traditional Tabriz.

The traditional commercial and administrative axes of Tabriz illustrate how the city works. Organizing the accommodation facilities and public buildings, the commercial axis was formed on the Silk Road: it began from Khiyaban gateway on the east, passed through the great covered bazaar at the city center and reached Davachi and Istanbul gateways in the northwest. The administrative axis of the city started from the castle on the south and reached Bagmishe gateway on the road where governmental buildings existed. Kohne Meydan, an important public node of Tabriz before the 14th century, was located on the administrative axis (Figure 3). By developing Sahibabad Complex in the 15th century, the commercial axis of Tabriz attained administrative importance as well. The covered bazaar was extended over Aji Chay River by the two market bridges to link with Sahibabad Meydan.

To focus on Sahibabad Meydan, the next analyses are done on the block level by the square with a side length of 500 meters which is shown in red color in Figure 2. Sahibabad Meydan is considered one of the first predesigned governmental meydans of Iran with a geometrical form used to hold military parades, official ceremonies and public activities (Hanachi & Nejad, 2006). Its morphological features articulated the relationship between the government and society; on one side the palaces and administrative buildings and on the other side the covered bazaar and public facilities. Sahibabad Meydan linked the political power and the social sphere.

The exact border of Sahibabad Meydan is unrecognizable in visual documents like the miniature of Matrakçı Nasuh, an Ottoman statesman, who visited Tabriz in the 16th century

Figure 1. The 1827's map of Tabriz drawn by the Russian army and the Dar-ol-Saltane map prepared by Colonel Qarajeh-Dagi in 1880, source: https://eachto.ir/.
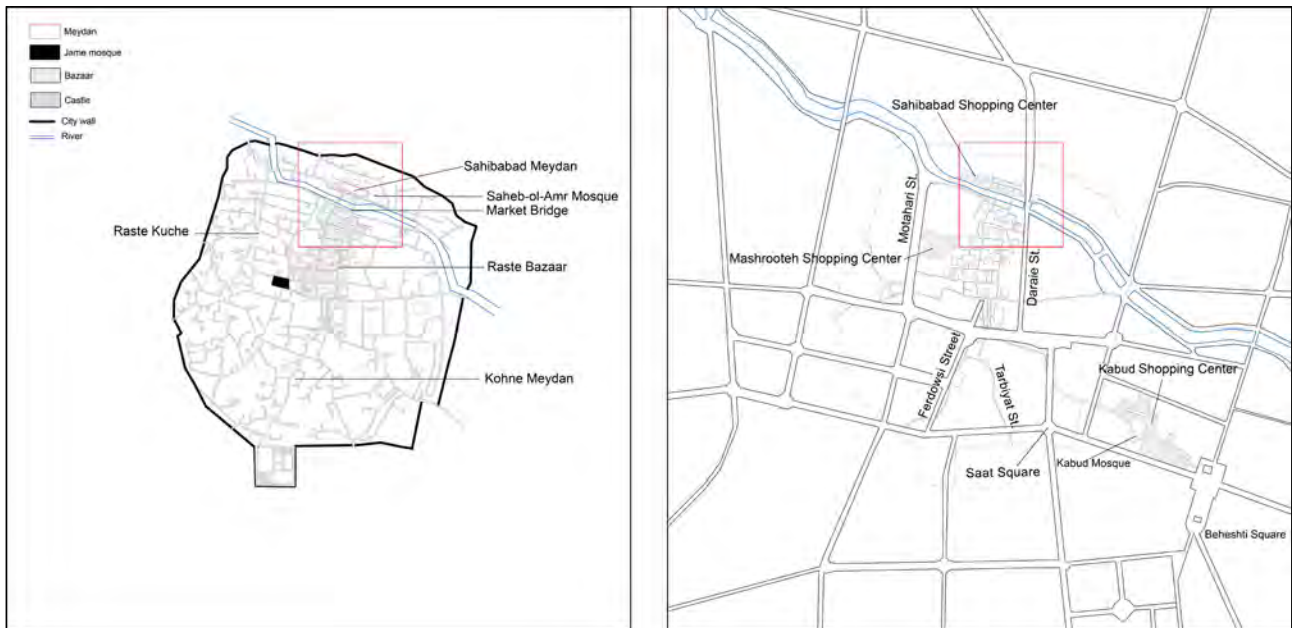
Figure 2. The traditional and the present time urban structure of Tabriz on the city level by the square with a side length of 3 km.
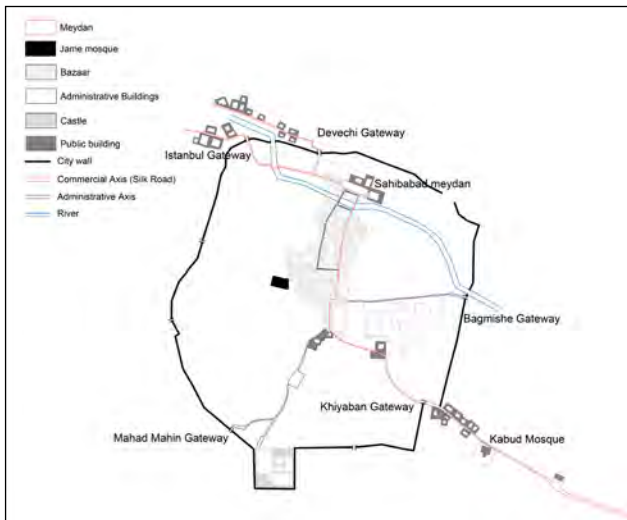

Figure 3. The morphological analysis of the traditional Tabriz; the main urban axes.

and Jean Chardin, a well-known traveller, who sketched an overall cityscape of Tabriz in 1673. The studies reveal that the original form of Sahibabad was vertical to Aji Chay river and bigger than what is seen on the 1905's map (Hanachi & Nejad, 2006) (Figure 4).

Being under threats, particularly from Ottoman army, the capital was transferred from Tabriz to Qazvin in the mid-16th century. Therefore, Sahibabad Meydan lost its administrative functions. Despite reducing in size, it continued to be an active urban node as it can be recognized on the maps of 1827 and 1905. Thanks to the public buildings and the connection with the traditional bazaar, Sahibabad Meydan was an appropriate place to accommodate traders who entered the city from the northwest gates. Sahibabad transformed from a glorious governmental meydan to a middle-size commercial meydan.
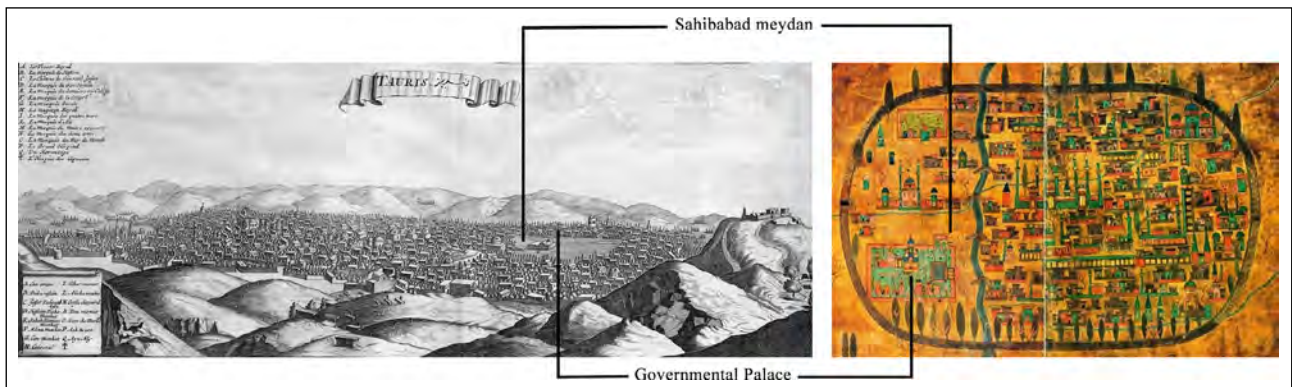

Figure 4. The sketch and miniature of Tabriz by Jean Chardin in 1673 and Matrakçı Nasuh in the 16th century.

SAHIBABAD MEYDAN AFTER THE URBAN MODERNIZATION OF TABRIZ

In the first Pahlavi period (1925–1945), the secular and authoritarian state attempted to modernize the country in all social and physical aspects. Wide streets were constructed in almost all of the Iranian cities without any care for the historic urban context. The vehicle-oriented approach had no conformity with the congested organic pattern of the traditional Iranian cities. This transformation is illustrated by Ehlers and Floor by a schematic map in which the traditional structure is carelessly destroyed by the new street network (Ehlers & Floor, 1993). As shown in Figure 5, two modern streets cut through the historic fabric and intersected at the center where a roundabout as the new center of the city was produced. In Tabriz, Saat Square with the statue of the King in the middle was formed to symbolize the new city center (Mirmozafari & Taraf, 2018). The monumental buildings like the municipality have become the landmark of the city gradually over time. Nowadays, Saat Square is a car-oriented roundabout where religious and governmental ceremonies are held occasionally.

The destructive impact of urban modernization on Tabriz's traditional structure was relatively high. The historic commercial and administrative axes were interrupted and the urban elements lost their spatial relationship. In the aerial photo of 1956, it is obvious that the middle of Sahibabad Meydan is occupied by some buildings and its size became smaller (Figure 6). Losing its main function, the meydan was swallowed by the traditional bazaar that was going to be encircled by the modern streets. Daraie Street, built in the 1960s on the east side of the covered bazaar, destroyed a part of the historic Sahibabad Complex and separated Sahib-ol-Amr Mosque from the meydan. The traditional commercial axis no longer existed, and the new street network has generated a new system based on fast transportation and easy access. In the new morphological logic of Tabriz, Sahibabad Meydan could not maintain its existence as a large open space with socio-economic roles.

In the aerial photo of 2003, the bridge markets between the traditional bazaar and Sahibabad Complex disappeared. It indicates that the north side of Aji Chay River is acting independently from the traditionally covered bazaar. On the south side, the modern Jomhuri Street has become an important trading axis that provides the intensive commodity flow of the bazaar (Khalilabad et al., 2016). The magnificent meydan of the 15th century, which is believed to be a model for the next generation of urban space, has completely lost its function, position, and therefore its morphological characteristics. The renovation of Sahibabad Meydan was thought to provide an active public space and at the same time reconstruct the historic identity of Tabriz.
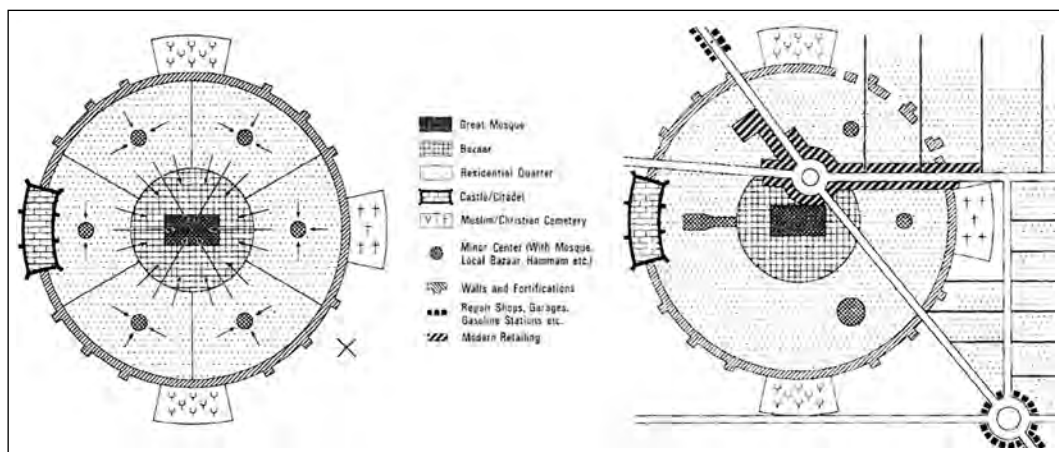

Figure 5. The schematic model of traditional Iranian city and its transformation after the modernisation, source: Ehlers & Floor, 1993.

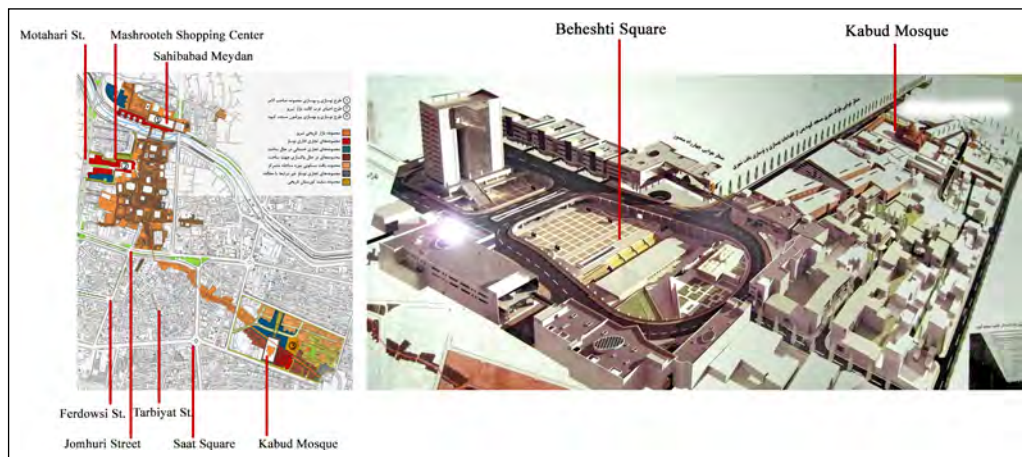**Figure 6.** The transformation of Sahibabad Meydan through time.

Figure 7. The project of "Restructuring the Historic Silk Road of Tabriz" designed in 2004 (left) and a bird view from Beheshti Square and Kabud Shopping Centre (right), source: Bavand Co. 2004.

In 2004, the project "Restructuring the Historic Silk Road of Tabriz" was proposed and designed by Bavand Consulting Engineers (Bavand Co., 2004). The large-scale project started from Beheshti, a new modern square on Imam Street, continues on the traditional commercial axis with two shopping centres of Kabud and Mashrooteh and ends at Sahibabad Complex. The traditional commercial axis is supposed to be reorganized by these projects between the two meydans symbolized the beginning and end of the vanished Silk Road (Bavand Co., 2004) (Figure 7).

The first phase of "The Rehabilitation and Renovation Project of Sahibabad Complex", including the renovation of two traditional market bridges and a multi-story shopping center, was completed in 2010. In the second phase, 70 shops that occupied the area of Sahibabad Meydan needed to be expropriated, and also Daraie Street was required to be closed to reconnect the destructed part of Saheb-ol-Amr Mosque. However, the expropriation became impossible as the new luxury shopping center remained empty and unused. The first phase of the project has not satisfied the financial expectations, and the second phase has been paused since 2010. The new economic relationships have produced a pattern in which the traditionally covered bazaar of Tabriz has no longer a central role (Safamanesh et al., 1997).

THE EVALUATION OF SAHIBABAD MEYDAN BY THE ANALYTICAL METHODS

The present study aims to investigate how the traditional Sahibabad Meydan may act in the present structure of Tabriz. Space syntax provides the appropriate tools to evaluate the functionality and spatial quality of urban spaces. By comparing the models of integration measures, it is possible to understand how interventions affect urban spaces. Roshani and Sagafi (2016) conducted the Axial Map analysis to study the urban transformation of Tabriz

by comparing the models of Integration Rn measure in the four time periods: 1907, 1947, 1970, and 2013. The models illustrate how Tabriz has lost its global integration in the historic core through urban modernization and uneven expansion (Roshani & Sagafi, 2016). However, their study lacked the local Integration (R3) analysis that priorities the short-distance movement that is important to evaluate the traditional urban structure of Tabriz. The standard deviation, which is significant to recognize a homogenous structure, was also overlooked in Roshani and Sagafi's study. Another study, using Space Syntax, illustrated that the socialization potential of the traditional bazaar of Tabriz has decreased after the modernization. The study was limited to the borders of the historic bazaar and its impacts on other urban elements were not considered (Najjari Nabi & Mehdinezhad, 2020).

Accessibility, centrality and visibility have been recognised as the significant factors in the failure or success of urban spaces (Hillier & Hanson, 1984). Space Syntax provides the appropriate methods to evaluate these features in the renovation project of Sahibabad Complex. In the present study, the Axial Map analysis is conducted at the local level to understand the impacts of the changing street network on Sahibabad Meydan. Three maps that represent the changing condition of the meydan are used: the traditional map of Tabriz based on the 1905's map, the current time based on the 2013's Comprehensive Plan, and a presumed map when the renovation of Sahibabad Meydan will be completed. The model of local Integration (R3) measure illustrates the accessibility pattern of the traditional Tabriz. Raste Bazaar, the longest and the main passage of the covered bazaar from which other branches stemmed, has the highest integration value. Raste Bazaar was the key element of the commercial axis that extended through the bridges toward Sahibabad Meydan. Located on the main urban axis, the meydan was strongly integrated with the city center despite the river between.

Through urban modernization, the traditional urban structure of Tabriz was totally transformed. The covered bazaar has been encircled by Daraie Street in the east, Motahari Street in the west and Jomhuri Street in the south sides. The streets provide the main traffic of the city center, a task that was once taken on by the traditional commercial axis. The Integration R3 model of 2013 illustrates the new street network as the most integrated element of the current time (Figure 8). The traffic statistics confirmed this hypothesis as the new streets, particularly Jomhuri, are further used by both vehicles and pedestrians (Roshani & Sagafi, 2016). The traditional commercial axis is no longer the most accessible and central element of the city. It is assumed that the renovated Sahibabad Meydan will comprise different morphological characteristics in comparison to the past.

To have a better look at Sahibabad Meydan and its surrounding elements, the Integration R3 models are enlarged in Figure 9. The numerical values are also presented in Table 1 to exactly realize the changes happen in the whole structure of Tabriz and the axes inside the limit of Sahibabad Meydan.

Regarding the table, the average value of the whole city in the present time is more than the traditional structure. It always happens as the modern streets built on an organic urban fabric would increase the number of connections (Karimi, 2000). Having higher Integration values cannot be sufficient to recognize an urban structure as more integrated. The standard deviation is also an important factor to evaluate how homogeneous is the structure. If the standard deviation increases along with the average, it means that a small number of elements, which are the new streets, obtained very high values; whereas others, which are the traditional urban elements, become more segregated. The standard deviation of the 2013's model (0.74) is higher than the 1905's model (0.54); it means that despite its higher value, the whole urban structure of modern Tabriz is less integrated than the traditional city.

Despite the growth in the whole integration values, the average of Sahibabad Complex has decreased from 2.27 in 1905 to 1.98 in 2013. This indicates that the traditional urban elements have lost their accessibility and importance in the modern city. The renovation of Sahibabad Meydan is

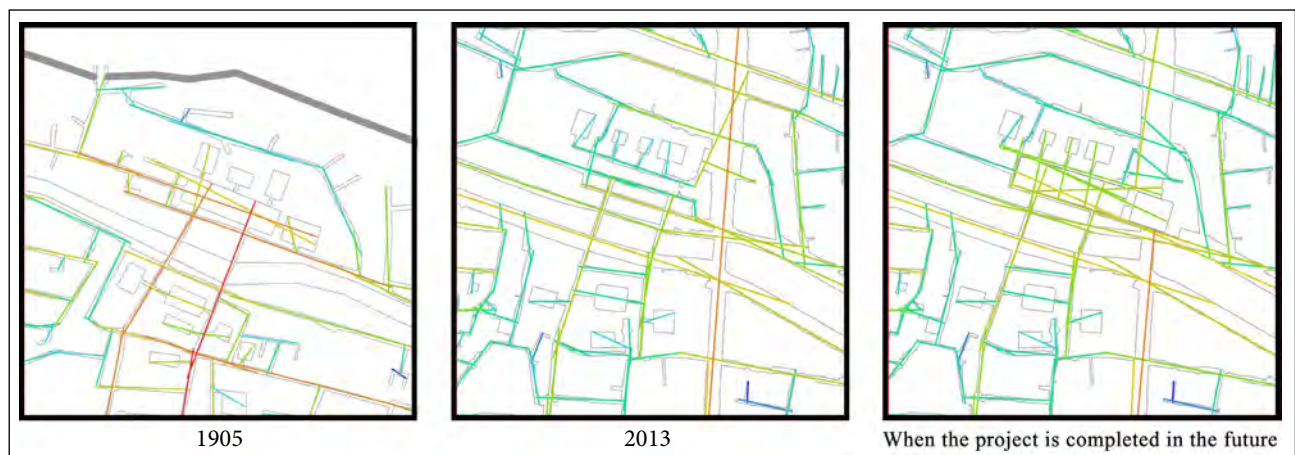**Figure 8.** The models of local Integration R3 for the historic core of Tabriz in the three periods.

Figure 9. The enlargement of the Integration R3 model to zoom on Sahibabad Meydan.

Table 1. The numerical values of Integration R3 measure for the whole Tabriz and the site of Sahibabad Meydan, source: author, 2020

	Axial map analysis integration HH R3 values				
	Average	**Minimum**	**Maximum**	**Standard Deviation**	**Axial Count**
The whole city structure					
1905	1.38	0.33	2.94	0.54	398
2013	1.72	0.21	4.24	0.74	1421
When the project is completed in the future	1.72	0.21	4.22	0.74	1425
Sahibabad Meydan					
1905	2.27	1.85	2.94	0.36	7
2013	1.98	1.12	2.92	0.63	10
When the project is completed in the future	2.58	2.23	3.04	0.26	12

an attempt to revive the significance of the historic urban space. The model prepared after the project completion illustrates that the integration of the meydan shows a considerable increase from 1.98 in 2013 to 2.58. Despite the total integration value of Tabriz remains unchanged (1.72), the project has a very positive impact on the centrality and accessibility of Sahibabad Meydan.

The renovation of Sahibabad Complex necessitates Daraie Street to be closed down by reconstructing the courtyard of Saheb-ol-Amr Mosque. In this situation, the covered bazaar will provide the main connection to the other side of Aji Chay River. This makes Sahibabad Meydan an important urban element as the increase in its integration value indicates. However, it seems to be difficult for the city managers to shut down Daraie Street as it is the main part of the heavy vehicle traffic of the city centre. The Comprehensive Traffic Plan of Tabriz, prepared by Naghsh-e-Mohit Consultants in 2013 almost a decade after the designing of Sahibabad Meydan, demonstrates it (Figure 10). On the plan, Daraie Street was identified as a second-degree route with a relatively high rate of traffic (Naghsh-e-Mohit Co., 2013). No comprehensive study seems to be done to solve the traffic problems that the renovation project of Sahibabad Complex may cause. The main circulation of a metropolis like Tabriz can no longer be done by traditional channels.

Neither the capacity nor the facilities of the historic axes can respond to the increasing population of the city.

Two scenarios can be considered for the future of Sahibabad Complex. In the first one, Sahibabad Meydan will be renovated without completing the complex, and Daraie Street will remain intact. In the second scenario, the courtyard of Saheb-ol-Amr Mosque will be reconstructed and Daraie Street will be closed to car traffic. Both scenarios are evaluated to understand the impacts of a modern street on a historic urban space. It is significant to predict the performance of Sahibabad Meydan before investing a relatively large budget. The Axial Map analysis illustrates the fundamental impacts of modern streets like Daraie on the performance of urban spaces. It is assumed that Sahibabad Meydan will fail to be an accessible and central urban space if the first scenario comes about.

Visual Graph Analysis (VGA) is an appropriate method to evaluate the spatial qualities of urban space. The visibility of Sahibabad Meydan and its potential for social activities are assessed by the measures of Visual Integration and Visual Clustering Coefficient according to the two scenarios mentioned above. In the models, the high values of measure are depicted by the warm colours (red, orange and yellow) and the lower values by the cold colours (blue, cyan and
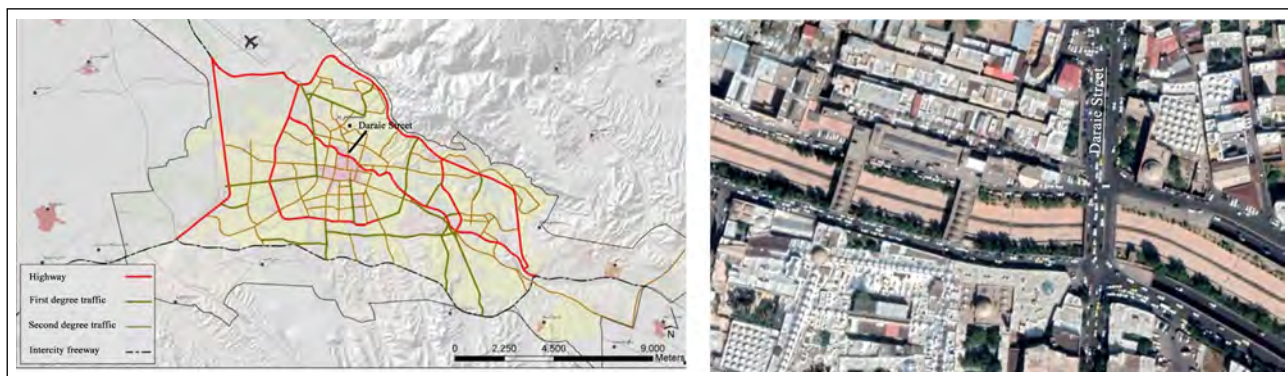

Figure 10. The Comprehensive Traffic Plan of Tabriz, source: Naghsh-e-Mohit Co., 2013, and the aerial photo of Sahibabad Complex and Daraie Street, source: google earth, 2020.

Table 2. The numerical values of measures by VGA in different states before and after the completion of the renovation of Sahibabad Meydan, source: author, 2020

Measures maps	Visual integration average	Sahibabad Meydan visual integration/ Average	Raste Bazaar visual integration/ Average	Visual clustering coefficient average
Traditional map '1905)	3.23	1.36	1.48	0.86
2013	4.62	0.90	1.05	0.84
When the project is completed in the future	3.72	1.33	1.20	0.85
When the project is completed in the future without closing Daraie Street	5.06	1.01	1.08	0.85

green). The numerical values of the analyses are presented in Table 2 to make the comparisons more accurate.

Regarding the Visual Integration models in Figure 11, if the project of Sahibabad Complex is completely implemented, the visibility of the renovated meydan (1.33) will be similar to the traditional Sahibabad Meydan (1.36). It shows a considerable increase in comparison with 2013's visual integration value (0.90) and also in the case when the project is completed in the future without closing Daraie Street. The visibility of Raste Bazaar also shows an increase after the completion of Sahibabad Complex (1.20), and this indicates that the project will contribute to the traditional commercial axis to be more attractive than the 2013's model (1.05). The visibility pattern of the second scenario, when the project is completed in the future without closing Daraie Street, is approximately the same as the 2013's model.

A few increases can be seen in the value of Sahibabad Meydan (from 0.90 to 1.01) and Raste Bazaar (from 1.05 to 1.08). It means that without closing the modern street, the renovated meydan will not be visible and attractive enough to be a popular public space.

The models of Visual Clustering Coefficient present the areas with high potential for social interactions through warm colours. The room-like spaces are preferred for public activities and the areas like the intersection of streets are recognized as the place for decision making (illustrated by blue tones) that are not suitable for social interactions.

In the models of Visual Clustering Coefficient, the courtyards of public buildings, parts of the streets, and the meydan are presented as the appropriate places for social activities (Figure 12). However, it was demonstrated that the physical features themselves are not sufficient to make an urban
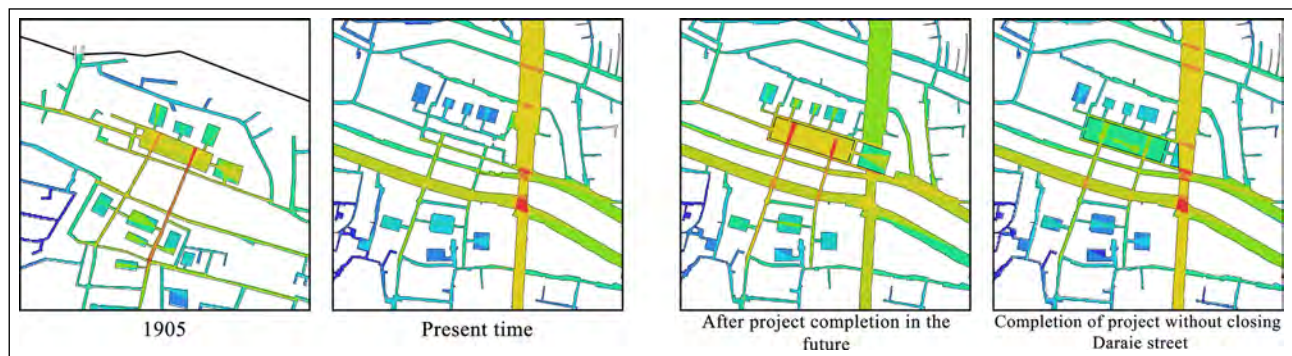

Figure 11. The models of visual integration measure for Sahibabad Complex.
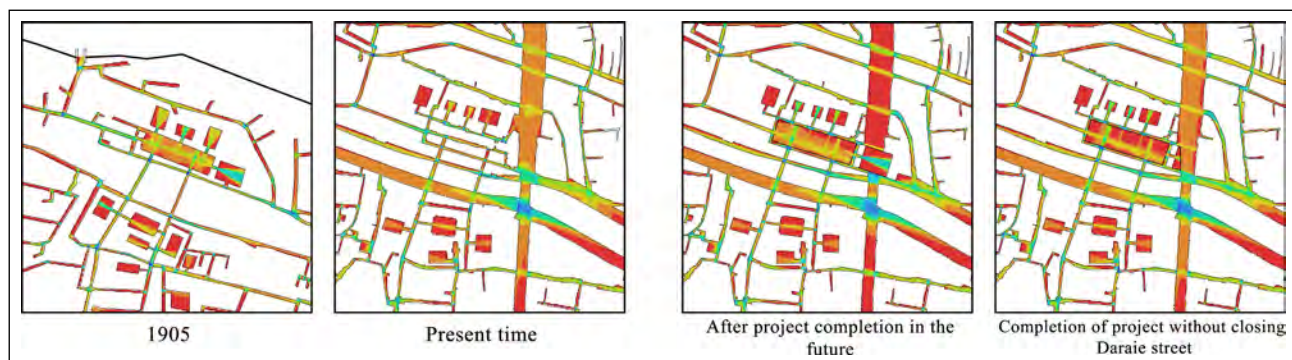

Figure 12. The models of visual Clustering Coefficient conducted by VGA for Sahibabad complex of Tabriz.

space successful (Hillier, 2007). Centrality, accessibility, and visibility are also the fundamental qualities that a place requires in this sense. Therefore, it is essential to identify the areas which possess the all characteristics mentioned in both analyses. The correlation between the measures of Visual Integration and Visual Clustering Coefficient can be depicted by the scatter plot diagram that is accessible in Depth map program. On the diagram, the points with the maximum values are selected and their equivalent areas are represented on the map. The aim is to determine the areas that will be visible, accessible, and at the same time have a high potential for social activities. The correlation maps reveal the significant difference between the two scenarios expected for the project completion (Figure 13).

There is no meaningful relationship between the values of Visual Integration and Visual Clustering Coefficient as can be seen in the scatter plot diagrams. It means that an area may have the potential to place social gatherings without being visible, accessible and attractive. The method applies in the present study makes it possible to identify the elements with maximum values of both measures. The red points framed inside the black box on the diagrams and the red areas on the map present the elements with the highest values. These maps make it possible to evaluate

the condition of Sahibabad Meydan regarding the two scenarios of whether Daraie Street will be closed or not. If the renovation project of Sahibabad Complex is fully implemented and the courtyard of Saheb-ol-Amr Mosque closes Daraie Street (the first scenario), Sahibabad Meydan will be a central and visible urban space with a high potential for social activities. By closing Daraie Street, a stronger relationship will be formed between the great covered bazaar and Sahibabad Meydan. The meydan will be the destination of more pedestrian movement, and according to Hillier's theories of "natural movement" and "the movement economy", Sahibabad Meydan can attract more commercial activities. In an alive urban space, the axes that encourage people to more movement will be the streets on which commercial and social activities, especially retail, tend to develop (Hillier, 2007). If Sahibabad Meydan is renovated without closing Daraie Street (the second scenario), the spatial configuration of the complex will be totally different. The modern street, illustrated in red color on the correlation map, will continue to be the most central and visible urban element, and Sahibabad Meydan will become a relatively segregated urban space with less visibility and attractiveness.

Figure 13. The correlation between the measures of visual Integration and Clustering Coefficient by scatter plot diagram.

CONCLUSION

The historic core of Tabriz is still an important socio-economic center. The traditionally covered bazaar represents the economy and Saat Square is the symbolic administrative node of the city. To respond to the changing needs of society, urban design projects in the historic context are inevitable. Sahibabad Meydan was a traditional urban space that reminds the glorious past of Tabriz as the capital of Iran in the 14th and 15th centuries. Its renovation was proposed to recover the historic identity of Tabriz and to meet the shortage of active public spaces. The present study claims that the changing urban structure of Tabriz was not taken to account in the renovation project of Sahibabad Meydan.

Urban morphology and Space Syntax are the methods used to understand how radically the morphological logic of Tabriz has been changed. The significant socio-economic role of the traditional bazaar has decreased by the new street network that has nothing to do with the historic urban fabric. Jomhuri and Daraie Streets have restricted connections of the bazaar by ripping up the traditional urban axes. The permeability of the covered bazaar as well as its socialization and functional potential has been reduced. Sahibabad Meydan which was in a strong relationship with the bazaar has also lost its strategic position. The modern street presents a linear organization that is used for transportation, commercial activities and socialization; a new type of urban space that never existed in the traditional Iranian city.

By the analytical methods of Space Syntax, a comparative study is conducted. The commercial axis, which was once the most integrated, central and accessible element of the historic city, is replaced by the new street network. The correlation of Visual Integration and Clustering Coefficient measures reveals how destructive impacts a single modern street can make on the visibility, centrality and accessibility of the historic urban space. Daraie Street plays a significant role as the renovation of Sahibabad Meydan will only be successful if the street is closed. Otherwise, the meydan will be an isolated and abandoned place that is unable to meet expectations. The study highlights the importance of urban morphology and Space Syntax to take an objective approach in the evaluation of urban projects, particularly in the historic context. In similar urban design projects around the world, the same methodology can be applied to build insight for future development.

- *This article is based on the Ph.D. Dissertation entitled Urban Morphological Study as a Method of Urban Design Assessment in a Historic Context: Imam Square of Urmia by Meysam Soleimani and completed under the supervision of Prof. Dr. F. Cânâ Bilsel at METU, Department of Architecture in 2020.*

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