

Review

Identification and empowerment of capabilities and potentials in urban tourism with an approach to enhancing brand image and personality: A case study of Tabriz City

Hassan Ahmadzadeh¹, Majid Dadashpour Moghaddam^{2,*}¹ Department of Geography and Urban Planning, Tabriz, Branch, Islamic Azad University, Tabriz 5157944533, Iran² Independent Researcher, Tabriz 5157818964, Iran* **Corresponding author:** Majid Dadashpour Moghaddam, Majid.dadshpour.m@gmail.com

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Abstract: This research focuses on identifying and enhancing the capabilities and potentials of urban tourism with the aim of improving the brand image and personality in Tabriz City. The research methodology, given its practical nature, is based on the analytical-survey method. The statistical population includes all city managers and experts in the tourism sector of Tabriz City. The data were analyzed using SPSS software, and the ANP and TOPSIS Fuzzy decision-making models were employed for prioritizing criteria. The results indicate that Tabriz City possesses exceptional tourism power, capacity, and potential. The examination of urban tourism capabilities and potentials in Tabriz demonstrates that its tourism capacity is particularly pronounced in the social, cultural, traditional, historical, and architectural domains. The social and cultural identity index of the city (celebrities, music) with a normalized weight of 0.0277, the presence of historical entities in the city with a normalized weight of 0.0274, the old context with traditional architecture (houses, mosques, etc.) with a normalized weight of 0.0272, great variety in souvenirs and food products with a normalized weight of 0.0271, creating a sense of belonging to a neighborhood among residents with a normalized weight of 0.0270, and special customs in the city (food styles, etc.) with a normalized weight of 0.0270 are among the most important indicators. Therefore, city managers and officials in the tourism sector of Tabriz should pay special attention to the social and cultural capacities and historical and architectural components to introduce Tabriz as a cultural and historical city at both the national and international levels. The tourism planning for Tabriz should be based on the city's cultural, architectural, and historical attractions.

Keywords: urban tourism; city brand; brand personality; Tabriz City

1. Introduction

Urban tourism encompasses the activities of both international and domestic tourists, as well as local residents, in urban areas, seeking to explore natural landscapes, facilities, infrastructure, and other urban attractions [1]. Urban tourism is a type of tourism that takes place in urban spaces and is characterized by inherent features facilitated by non-agricultural-based economies, such as administration, production, trade, and services, often with pivotal transportation hubs [2]. Urban tourists, when visiting city destinations, are in search of cultural, architectural, technological, social, and natural experiences, as well as leisure activities and business opportunities. On the other hand, in recent years, urban branding has become a significant tool employed by local governments to enhance their competitive position in urban tourism. Through branding, local governments aim to attract investments, skilled professionals, tourists, and new businesses to their regions. Research has

identified three main components of city branding, including: 1) developing and enhancing local products and services related to the city; 2) efforts to create an attractive image; and 3) marketing activities in target markets. However, researchers agree that the primary objective of urban branding is to develop an attractive image. Today, a brand or a name represents the perception and mental image of a tourist destination in the traveler's mind, defining the destination's services, functions, and tourism identity. The importance of having a brand lies in the fact that it elevates the level of trust and loyalty of travelers to the tourism destination. A city brand is a valuable asset that enhances the competitive advantage of a city in the era of globalization [3]. A brand can be considered one of the most crucial factors in attracting tourists. A tourist destination must introduce itself to the world with a distinctive feature during a certain period, allowing tourists to determine their destination based on that feature. Chris considers the most important components of a city brand to be the city's attractiveness, vibrant urban lifestyle, and residents' enthusiasm [4]. Therefore, each major city in the world has its own special reputation and charisma based on its capacities, facilities, and activities that distinguish it from other cities. This reputation and charisma, interpreted as a city brand, are a blend of historical identity, social characteristics, cultural symbols, commercial activities, recreational facilities, political and international relations, and other elements that define the city's brand identity. City branding promotes the historical background, quality of place, lifestyle, and culture to create a competitive advantage. It strengthens the city's position as a place for residence, business, and tourism [5]. The desirable image of a city in the minds of residents and others can attract more investors, tourists, and migrants. Rainisto states that place branding allows for the utilization of the image value of a place [6]. A city brand embodies the symbolic values of an urban place. A city brand goes beyond a name and slogan, taking shape based on the local identity and conditions of the city [7]. Kotler et al. [8] argue that city branding represents the connection between the brand name and the goals of city marketing and image management. Moreover, managers of cities need a proper understanding of the current image of the city and influential factors in shaping it to plan and make appropriate decisions for the city [9]. In general, the quality of services provided and the mental image of the brand name and logo are among the most critical factors affecting consumer decision-making processes, especially in service industries such as tourism [10]. Trueman et al. [11] believe that the result of city branding is satisfaction with the city since it encompasses a wide range of stakeholders. Therefore, this research seeks to investigate the capabilities and potentials of urban tourism in Tabriz and ways to create a suitable city brand. Tabriz, as a major city in the western region of the country, has high potential in the field of urban tourism. However, due to weaknesses in identifying these desirable features and utilizing these capacities effectively, this powerful potential remains untapped. Tabriz, with a favorable situation in tourism, lags far behind in attracting investors, tourists, and skilled professionals. In the tourism discourse, neglecting the specific features of this region and insufficient utilization of various attractions have distanced Tabriz from the position it could have in this field (tourism). Therefore, identifying symbols and key potentials and utilizing these

symbols and tourist attractions in Tabriz to communicate the desired image nationally and internationally is the main focus of this study.

2. Research methodology

The research methodology employed is both applied, based on its objectives, and descriptive-analytical in nature. Data were collected through interviews and questionnaires, utilizing simple random sampling as the sampling method. The analysis of the data was conducted using SPSS software. To identify indicators, capabilities, and potentials, the fuzzy technique was applied, leading to the clustering of the main criteria. Subsequently, the pattern of causal relationships was discerned using the DEMATEL technique. Additionally, a pairwise comparison was conducted for each element within its respective cluster. The criteria and sub-criteria identified were then structured using the Analytic Network Process (ANP). The ANP analysis technique was instrumental in achieving the study's objectives. In the final stage, the fuzzy TOPSIS method was employed to establish the priorities.

3. Descriptive findings

- Out of the total sample of 100 individuals, approximately 61.8% were male and 34.9% were female.
- The majority of the research sample fell into the age groups of 31–40 years and 41–50 years.
- The examination of age groups indicates that the majority of the research sample belonged to age ranges where they had the ability to comprehend the questions effectively.
- An effort has been made to incorporate the perspectives of experts in investigating the subject.
- About 26.6% of respondents had non-university education, while 73.4% had university education.
- Non-university-educated individuals were typically those engaged in tourism-related activities.

4. Analytical and inferential findings of the research

In the initial step, the tourism capacities and potentials of Tabriz City were identified in multiple dimensions. These potentials were extracted by consulting with experts and elites in the field of tourism.

To determine the importance and level of significance of sub-criteria and key indicators, expert opinions were utilized. Although experts use their marketing insights and mental abilities for comparisons, it should be noted that the traditional process of quantifying individuals' perspectives may not fully reflect the human thinking style. In other words, the use of fuzzy sets has better compatibility with linguistic and sometimes ambiguous human descriptions. Therefore, employing fuzzy sets (using fuzzy numbers) is preferred for long-term prediction and decision-making in the real world. In this research, the Likert spectrum method described in **Table 1**

and triangular fuzzy numbers were used to fuzzify the opinions of experts and elites (Figure 1).

Table 1. Triangular fuzzy numbers equivalent to a nine-degree Likert scale [n].

Definitive equivalent	Linguistic variable	Fuzzy number scale
1	Very unimportant	(1,1,1)
2	Very unimportant to unimportant	(1,2,3)
3	Unimportant	(2,3,4)
4	Unimportant to medium importance	(3,4,5)
5	Medium	(4,5,6)
6	Medium to important	(5,6,7)
7	Important	(6,7,8)
8	Important to very important	(7,8,9)
9	Very important	(9,9,9)

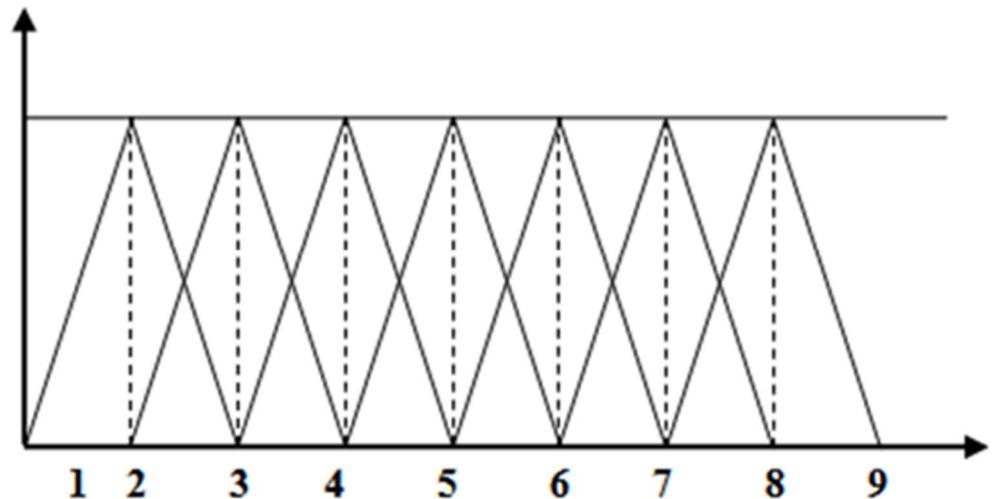


Figure 1. Valuation of indicators relative to each other using triangular fuzzy numbers.

“After the fuzzification of experts’ point of view, the fuzzy averages of people’s scores are calculated to evaluate the relative importance of indicators. This evaluation employs triangular fuzzy numbers, encapsulated in the methodology as Equation (1):

$$\tau_j = (L_j, M_j, U_j) \quad L_j = \min(X_{ij}) \quad M_j = \sqrt[n]{\prod_{i=1}^n X_{ij}} \quad U_j = \max(X_{ij}) \quad (1)$$

The index i refers to the expert. So that:

X_{ij} : The evaluation value of the i th expert from the j th criterion;

L_j : The minimum amount of evaluations for the j th criterion;

M_j : The geometric mean of the experts’ assessment of the performance of the j th standard;

U_j : The maximum value of evaluations for the j th criterion This model allows for a comprehensive evaluation of indicators relative to each other using fuzzy logic, as depicted in Figure 1 and articulated in Equation (1).

The index ii corresponds to the expert providing the evaluation, while jj indicates the specific criterion being assessed. Here, X_{ij} signifies the evaluation value assigned by the i th expert to the j th criterion. This approach, detailed in Equations (1)–(15),

facilitates a nuanced aggregation of expert opinions, leveraging the flexibility of fuzzy logic to accommodate the inherent uncertainty and subjectivity in expert assessments.”

“In fact, these aggregation methods are experimental methods presented by different researchers. One well-regarded approach for aggregating a set of triangular fuzzy numbers involves employing the minimum (ll), average (mm), and maximum (uu) values of the dataset. This conventional method, as delineated by Zu et al., facilitates the effective summarization of fuzzy data, providing a structured framework for decision-making processes.”

$$F_{AGR} = \left(\min\{l\}, \left\{ \frac{\sum m}{n} \right\}, \max\{u\} \right) \tag{2}$$

Fuzzy average method is used in this study. The fuzzy average of n triangular fuzzy numbers will be calculated with Equation (3):

$$\tilde{F}_{AVE} = (L, M, U) = \left(\frac{\sum l_i^k}{n}, \frac{\sum m_i^k}{n}, \frac{\sum u_i^k}{n} \right) \tag{3}$$

In this regard, the triangular fuzzy number. $f_i^{\sim} = (l_i^k, m_i^k, u_i^k)$ is the fuzzy equivalent of the kth expert’s opinion about the *ith* criterion. The fuzzy average of the opinion of the expert panel for each of the research indicators is given in the attachment

5. De-fuzzification of values

For defuzzification, the surface center method is used as Equation (4):

$$DF_{ij} = \frac{[(u_{ij} - l_{ij}) + (m_{ij} - l_{ij})]}{3} + l_{ij} \tag{4}$$

“The fuzzy average and de-fuzzified output of the values related to the indicators are shown in **Table 2**. The de-fuzzified value greater than 7 is accepted, and any index with a score above 7 is approved, following the methodology proposed by Adel Azar et al. It can be observed that none of the investigated indicators had an average value of less than 7, leading to the final approval of 38 indicators.”

Table 2. Components, indicators and fuzzy average and fuzzy screening of indicators for evaluating the capacity and potential of urban tourism in Tabriz with the approach of improving the brand image and personality.

The main components	Column 1	Indicator	Symbol	Minimal	Average	Maximum	Fuzzy average	De-fuzzing
C1	Economic	A market with a unique economic function	S11	6	8.20	9	(6, 8.2, 9)	7.97
		Empowering residents and entrepreneurship in the field of tourism	S12	6	7.86	9	(6, 7.86, 9)	7.74
		Economic prosperity of the city	S13	6	7.98	9	(6, 7.98, 9)	7.82
		The communication, political, and commercial center of the northwest region	S14	4	7.73	9	(4, 7.73, 9)	7.32
		The presence of suitable economic capital in the city	S15	6	7.65	9	(6, 7.65, 9)	7.60
		The existence of jobs related to tourism	S16	2	7.79	9	(2, 7.79, 9)	7.03

Table 2. (Continued).

The main components	Column 1	Indicator	Symbol	Minimal	Average	Maximum	Fuzzy average	De-fuzzing
C2	Social and cultural	Social and cultural identity of the city (celebrities, music)	S21	6	7.78	9	(6, 7.78, 9)	7.69
		The presence of identity elements	S22	6	7.75	9	(6, 7.75, 9)	7.67
		Special customs in the city (food styles, etc.)	S23	6	8.02	9	(6, 8.02, 9)	7.85
		High social capital	S24	2	8.23	9	(2, 8.23, 9)	7.32
		There is a sense of neighborhood belonging among the residents	S25	6	8.02	9	(6, 8.02, 9)	7.85
		Handicrafts and souvenirs	S26	6	7.78	9	(6, 7.78, 9)	7.69
C3	Natural and environmental	Eel Goli park and gardens	S31	6	7.95	9	(6, 7.95, 9)	7.80
		Mountains and caves	S32	5	7.45	9	(5, 7.45, 9)	7.30
		Mehraneh River, waterfalls and springs	S33	2	7.86	9	(2, 7.86, 9)	7.08
		Arsbaran forest, Kandavan	S34	6	8.13	9	(6, 8.13, 9)	7.92
C4	Physical and infrastructure	The existence of a historical body in the city	S41	6	8.09	9	(6, 8.09, 9)	7.90
		The existence of tourism hardware (complexes, airport)	S42	4	8.06	9	(4, 8.06, 9)	7.54
		Service and business centers	S43	6	8.06	9	(6, 8.06, 9)	7.87
		Access to transportation	S44	6	7.95	9	(6, 7.95, 9)	7.80
		Roads and passages	S45	6	7.75	9	(6, 7.75, 9)	7.67
C5	Historical and architectural	Old texture with traditional architecture (houses, mosques, etc.)	S51	6	7.49	9	(6, 7.49, 9)	7.50
		The existence of tombs and towers and citadels	S52	6	7.48	9	(6, 7.48, 9)	7.49
		Markets and timchehs	S53	2	7.98	9	(2, 7.98, 9)	7.15
		Churches and caravanserais	S54	6	8.07	9	(6, 8.07, 9)	7.88
		Shrines and shrines	S55	6	7.55	9	(6, 7.55, 9)	7.53
		Historical elements and elements such as bridges	S56	6	7.65	9	(6, 7.65, 9)	7.60
C6	National recognition	Has historical and political experience at the national level	S61	6	7.76	9	(6, 7.76, 9)	7.67
		The city of the first	S62	6	7.65	9	(6, 7.65, 9)	7.60
		Tabriz carpets and leather (the world city of carpet weaving)	S63	6	7.56	9	(6, 7.56, 9)	7.54
		Wide variety of souvenirs and food products	S64	6	7.43	9	(6, 7.43, 9)	7.48
		A city without beggars	S65	5	7.68	9	(5, 7.68, 9)	7.45
		The safest metropolis in the country	S66	5	7.52	9	(5, 7.52, 9)	7.35
C7	Scientific and academic	Tabriz is an academic city	S71	2	7.89	9	(2, 7.89, 9)	7.09
		University diversity	S72	4	7.40	9	(4, 7.4, 9)	7.10
		Existence of elite people (professors and students)	S73	6	7.78	9	(6, 7.78, 9)	7.69
		The existence of knowledge-based companies	S74	4	7.72	9	(4, 7.72, 9)	7.31
		Science and Technology Park	S75	6	7.52	9	(6, 7.52, 9)	7.51

The research criteria and sub-criteria are listed in **Figure 2**. Also, the criteria and sub-criteria of the research are named with a numerical index (S11 to S75) as in **Table**

2 so that they can be easily tracked and studied during the research. Also, the hierarchical pattern of criteria and sub-criteria for evaluating the capacity and potential of urban tourism in Tabriz with the approach of improving the image and personality of the brand can be seen in **Figure 2**.

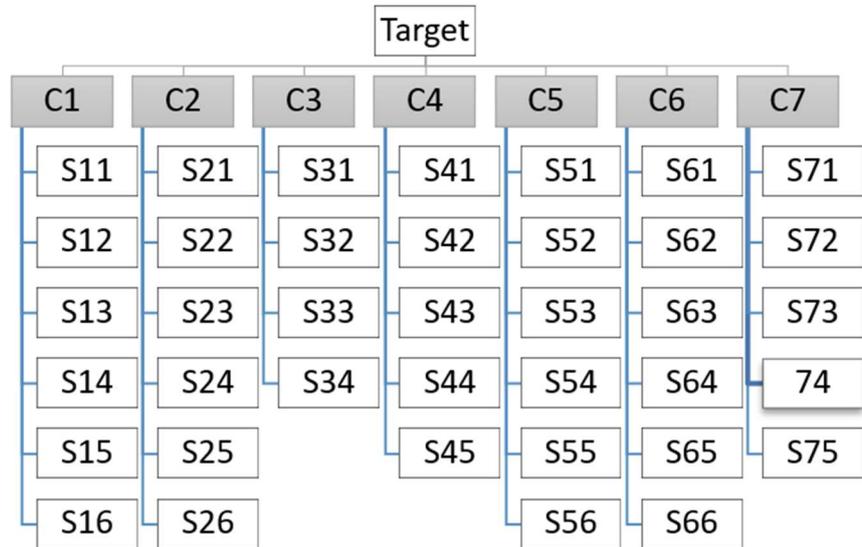


Figure 2. Hierarchical model of criteria and sub-criteria for evaluating the capacity and potentials of urban tourism in Tabriz with the approach of improving the image and personality of the brand.

5.1. Determining the priority of model elements using (ANP) technique

In this research, the network analysis method (ANP) has been used to determine the weight of the model’s criteria and indicators. First, the main criteria are prioritized based on the goal. Then the internal relationships between the main criteria have been identified. In the third step, each sub-criterion in the corresponding cluster is compared and prioritized. In the fourth step, the internal relationships of the sub-criteria are defined. Finally, by calculating the primary supermatrix, the balanced supermatrix, and the limit supermatrix, the final priority of the indicators has been determined.

The analysis steps are as follows:

- Prioritizing the main criteria based on the objective through paired comparison.
- Identifying the internal relationships between the main criteria and Dimtel’s technique.
- Prioritizing each sub-criteria in its respective cluster through pairwise comparison.
- Identifying the internal relationships between the sub-criteria and Dimetal’s technique.
- Calculation of the initial supermatrix, balanced supermatrix, and limit supermatrix.

In this way, the final priority of the indicators has been determined.

5.2. Determining the priority of the main criteria based on the goal (W21)

To perform the first network analysis, the main criteria based on the objective have been compared in pairs. Pairwise comparison is very simple and all the elements of each cluster should be compared pair by pair. Therefore, if there are n elements in a cluster, $(n(n-1))/2$ comparisons will be made.

Therefore, 21 pairwise comparisons have been made from the perspective of a group of experts. Using the geometric mean technique, the opinions of experts have been aggregated and used to calculate the final weight of the criteria.

The matrix of pairwise comparisons resulting from summarizing the opinions of experts is presented in **Table 3**.

Table 3. Determining the priority of the main criteria based on the goal.

	C1	C2	C3	C4	C5	C6	C7
C1	1.000	1.197	0.466	2.684	0.831	0.605	1.030
C2	0.836	1.000	1.303	1.007	0.595	0.308	1.360
C3	2.145	0.767	1.000	1.338	0.913	1.546	1.025
C4	0.373	0.993	0.747	1.000	1.665	1.269	1.290
C5	1.203	1.681	1.095	0.601	1.000	1.489	1.160
C6	1.653	3.246	0.647	0.788	0.672	1.000	0.770
C7	0.971	0.735	0.976	0.775	0.862	1.298	1.000

The next step is to calculate the geometric mean of each line to determine the weight of the criteria:

$$\pi_1 = \sqrt[7]{1 * 1.197 * 0.466 * 2.684 * 0.831 * 0.605 * 1.030} = 0.964 \quad (5)$$

In the same way, the geometric mean of other lines is calculated.

$$\pi_1 = 0.964, \pi_2 = 0.831, \pi_3 = 1.180, \pi_4 = 0.960, \pi_5 = 1.126, \pi_6 = 1.051, \pi_7 = 0.931.$$

Then the sum of the geometric mean of all lines is calculated.

$$\sum_{i=1}^m \pi_i = 7.043 \quad (6)$$

By dividing the geometric mean of each row by the sum of the geometric mean of the rows, the normal weight value is obtained, which is also called the eigenvector. The results are summarized in **Table 4**.

Table 4. Determining the priority of the main criteria of the urban tourism potential of Tabriz with the approach of improving the image and personality of the brand.

	C1	C2	C3	C4	C5	C6	C7	Geometric mean	Eigenvector
C1	1.000	1.197	0.466	2.684	0.831	0.605	1.030	0.964	0.137
C2	0.836	1.000	1.303	1.007	0.595	0.308	1.360	0.831	0.118
C3	2.145	0.767	1.000	1.338	0.913	1.546	1.025	1.180	0.168
C4	0.373	0.993	0.747	1.000	1.665	1.269	1.290	0.960	0.136
C5	1.203	1.681	1.095	0.601	1.000	1.489	1.160	1.126	0.160
C6	1.653	3.246	0.647	0.788	0.672	1.000	0.770	1.051	0.149
C7	0.971	0.735	0.976	0.775	0.862	1.298	1.000	0.931	0.132

According to **Table 4**, the special priority vector of the main criteria will be W_{21} .

$$W_{21} = \begin{pmatrix} 0.137 \\ 0.118 \\ 0.168 \\ 0.136 \\ 0.160 \\ 0.149 \end{pmatrix} \quad (7)$$

Based on the obtained special vector, the graphic representation of the priority criteria of the urban tourism potential of Tabriz will be shown in **Figure 3**.

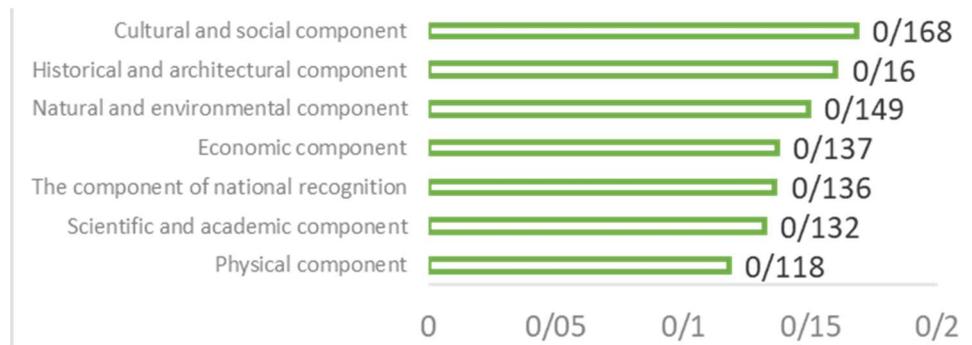


Figure 3. Graphic representation of priority of main criteria.

- The cultural and social component of Tabriz City is ranked first with a weight of 0.168.
- The historical and architectural component of Tabriz City is ranked second with a weight of 0.160.
- The natural and environmental component of Tabriz City is ranked third with a weight of 0.149.
- The economic component of Tabriz City is ranked fourth with a weight of 0.137.
- The component of national recognition of the city of Tabriz is ranked fifth with a weight of 0.136.
- The scientific and academic component of Tabriz is ranked sixth with a weight of 0.132.
- The physical and infrastructure component of Tabriz City is ranked seventh with a weight of 0.118.

The inconsistency rate of the comparisons made was found to be 0.075, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.3. Pairwise comparison of main criteria relationships (W_{22})

Based on the research model, the next step is to calculate the internal relationships of the main criteria to obtain the W_{22} supermatrix. In order to reflect the internal relationships between the main criteria, Dimatel technique has been used. So that experts are able to express their opinions regarding the effects (direction and intensity of effects) between factors with more mastery. It should be noted that the matrix obtained from the DEMATEL technique (matrix of internal communication) shows both the cause-and-effect relationship between the factors and the influence of the variables.

5.4. Calculation of direct correlation matrix (X)

When the opinion of several experts is used, the simple arithmetic average of the opinions is used and we form the direct correlation matrix or X (Table 5).

Table 5. Direct correlation matrix (X) of the main criteria.

X	C1	C2	C3	C4	C5	C6	C7
C1	0.00	1.93	2.20	2.40	2.00	2.03	2.17
C2	2.30	0.00	1.93	2.33	2.10	1.73	2.17
C3	2.00	1.50	0.00	1.50	2.23	2.10	2.23
C4	2.13	1.93	2.53	0.00	1.77	2.33	1.93
C5	2.30	2.30	1.67	1.90	0.00	2.17	1.90
C6	2.07	2.27	2.20	1.90	1.73	0.00	1.83
C7	1.93	2.03	2.10	1.57	1.67	2.00	0.00

5.5. Calculation of normal direct correlation matrix

First, the sum of all rows and columns is calculated. The largest number of rows and columns forms k. According to Table 6, the largest number is 12.73, and all the values listed in the direct correlation matrix according to Table 5 are multiplied by the inverse of this number to make the matrix normal, which is shown in Table 7.

$$k = \max \left\{ \max \sum_{j=1}^n x_{ij}, \sum_{i=1}^n x_{ij} \right\} = 12.73 \tag{8}$$

$$N = \frac{1}{12.73} * X \tag{9}$$

Table 6. Complete correlation matrix (T) of main criteria.

T	C1	C2	C3	C4	C5	C6	C7
C1	3.06	3.03	3.19	2.98	2.94	3.12	3.11
C2	3.18	2.87	3.14	2.95	2.92	3.07	3.08
C3	2.94	2.76	2.79	2.70	2.72	2.88	2.87
C4	3.18	3.00	3.19	2.80	2.91	3.11	3.07
C5	3.11	2.96	3.06	2.87	2.718	3.03	3.00
C6	3.05	2.90	3.04	2.81	2.788	2.84	2.94
C7	2.89	2.75	2.88	2.65	2.644	2.82	2.67

Table 7. Normalized matrix (N) of main criteria.

N	C1	C2	C3	C4	C5	C6	C7
C1	0.00	0.15	0.17	0.19	0.16	0.16	0.17
C2	0.18	0.00	0.15	0.18	0.16	0.14	0.17
C3	0.16	0.12	0.00	0.12	0.18	0.16	0.18
C4	0.17	0.15	0.20	0.00	0.14	0.18	0.15
C5	0.18	0.18	0.13	0.15	0.00	0.17	0.15
C6	0.16	0.18	0.17	0.15	0.14	0.00	0.14
C7	0.15	0.16	0.16	0.12	0.13	0.16	0.00

5.6. Calculation of the complete correlation matrix

To calculate the complete correlation matrix, the same matrix (I) is formed first. The same matrix for this table is a matrix like $I_{(7 \times 7)}$:

$$I_{8 \times 8} = \begin{bmatrix} 1 & \dots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \dots & 1 \end{bmatrix} \tag{10}$$

Then we subtract the same matrix from the normal matrix seen in **Table 7** and invert the resulting matrix and finally multiply the normal matrix by the inverse matrix, **Table 6**.

$$T = N(I - N)^{-1} \tag{11}$$

5.7. Display the map of network relations

A threshold value must be calculated to determine the Network Relationship Map (NRM). With this method, partial relationships can be ignored, and a network of significant relationships can be drawn. Only relations whose values in matrix T are greater than the threshold value will be displayed in NRM. To calculate the threshold value of relationships, it is enough to calculate the average values of the matrix T. After the intensity of the threshold is determined, all the values of the T matrix that are smaller than the threshold are zeroed; that is, the causal relationship is not considered. In this study, the threshold value is equal to 2.938. Therefore, the pattern of meaningful relationships is, according to **Table 6**, as follows:

Based on **Table 8**, the pattern of significant relationships among the main criteria of the model can be extracted. The pattern of cluster relationships is as follows:

Table 8. The pattern of significant relationships of the main criteria of the model.

	C1	C2	C3	C4	C5	C6	C7
C1	3.06	3.03	3.19	2.98	2.94	3.12	3.11
C2	3.18	X	3.14	2.95	X	3.07	3.08
C3	2.94	X	X	X	X	X	X
C4	3.18	3.00	3.19	X	X	3.11	3.07
C5	3.11	2.96	3.06	X	X	3.03	3.00
C6	3.05	X	3.04	X	X	X	2.94
C7	X	X	X	X	X	X	X

Figure 4 shows the Cartesian coordinates of DEMATEL output for the main criteria.



Figure 4. Cartesian coordinates of DEMATEL output for the main criteria.

According to the relationship pattern, the causal form can be drawn based on **Table 9**.

Table 9. Pattern of causal relationships of the main criteria of the model.

	<i>D</i>	<i>R</i>	<i>D + R</i>	<i>D - R</i>
Economic	21.42	21.40	42.82	0.02
Social and cultural	21.22	20.27	41.49	0.94
Natural and environmental	19.66	21.29	40.95	-1.64
Physical and infrastructure	21.26	19.76	41.02	1.49
Historical and architectural	20.75	19.64	40.39	1.11
national recognition	20.37	20.88	41.25	-0.51
Scientific and academic	19.30	20.72	40.02	-1.42

In **Table 9**, the sum of the elements of each row (*D*) indicates the influence of that factor on other factors of the system. Therefore, the economic component of Tabriz City has the most influence on other urban components. Physical infrastructure is in the next place. The scientific and academic dimensions are also the least influential.

The sum of the elements in the column (*R*) for each factor indicates the degree of influence of that factor on other factors of the system. Therefore, the economic factor is very influential. Natural and environmental capabilities and potential are also in the next position.

The horizontal vector (*D + R*) is the degree of influence and impression of the desired factor in the system. In other words, the higher the *D + R* value of an agent, the more interaction that agent has with other system agents. Therefore, the economic factor has the most interactions with the other studied criteria. Physical, infrastructural, scientific, and academic variables have the least interaction with other variables.

The vertical vector (*D - R*) shows the influence power of each factor. In general, if *D - R* is positive, the variable is considered a causal variable, and if it is negative, it is considered an effect. In this model, the economic, social, cultural, physical, historical, and architectural factors are the causal variables, and the natural environmental factors and national, scientific, and academic recognition are the effects of the formation of the image and personality of the brand in Tabriz City.

Comparing and determining the priority of the sub-criteria of the capabilities and potentials of urban tourism in Tabriz with the approach of improving the image and personality of the brand.

In the third step of the ANP technique, the sub-criteria of each criterion are compared in pairs.

5.8. Determining the priority of the economic sub-criteria of Tabriz City

Here too, the opinion of a group of experts has been used. The opinion of experts has been collected. The geometric mean of the experts' view of the calculations performed to determine the priority of the economic sub-criteria is presented in **Table 10**.

Table 10. Determining the priority of the economic sub-criteria of Tabriz City in line with the development of the city's image and brand.

Code	Criterion	S11	S12	S13	S14	S15	S16	Geometric mean	Eigenvector
S11	A market with a unique economic function	1.000	1.197	0.466	2.425	1.277	0.605	1.007	0.161
S12	Empowering residents and entrepreneurship in the field of tourism	0.836	1.000	1.766	1.349	1.179	1.030	1.158	0.191
S13	Economic prosperity of the city	2.145	0.566	1.000	1.338	1.167	1.546	1.196	0.198
S14	The communication, political, and commercial center of the northwest region	0.412	0.742	0.747	1.000	0.936	1.269	0.805	0.166
S15	The presence of suitable economic capital in the city	0.783	0.848	0.857	1.069	1.000	1.433	0.977	0.133
S16	The existence of jobs related to tourism	1.653	0.971	0.647	0.788	0.698	1.000	0.911	0.150

Based on the special vector obtained:

- The economic prosperity index of the city is ranked first with a weight of 0.198.
- The index of empowerment of residents and entrepreneurship in the field of tourism is ranked second with a weight of 0.191.
- The index of the communication, political and commercial center of the North-West region with a weight of 0.166 is ranked third.
- The market index with a unique economic function is ranked fourth with a weight of 0.161.
- The index of existence of jobs related to tourism with a weight of 0.15 has been ranked fifth.
- The index of the presence of suitable economic capital in the city is ranked sixth with a weight of 0.133.

The inconsistency rate of the comparisons made was found to be 0.055, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.9. Determining the priority of the social and cultural sub-criteria of the capabilities and potentials of urban tourism in Tabriz

The calculations performed to determine the priority of social and cultural sub-criteria are presented in **Table 11**.

Table 11. Determining the priority of social and cultural sub-criteria.

Cod e	Criterion	S21	S22	S23	S24	S25	S26	Geometric mean	Eigenvector
S21	Social and cultural identity of the city (celebrities, music)	1.000	1.197	0.466	2.425	1.019	0.605	0.970	0.158
S22	The presence of identity elements	0.836	1.000	0.807	0.677	0.595	0.325	0.667	0.109
S23	Special customs in the city (food styles, etc.)	2.145	1.240	1.000	1.338	1.167	1.546	1.363	0.222
S24	High social capital	0.412	1.477	0.747	1.000	2.062	1.269	1.029	0.168
S25	There is a sense of neighborhood belonging among the residents	0.982	1.681	0.857	0.485	1.000	1.136	0.959	0.156
S26	Handicrafts and souvenirs	1.000	1.197	0.466	2.425	1.019	0.605	0.970	0.158

Based on the special vector obtained,

- The index of specific customs in the city (food styles, etc.) is ranked first with a weight of 0.222.
- The index of high social capital, with a weight of 0.168, is ranked second.
- The city's social and cultural identity index (celebrities, music) is ranked third with a weight of 0.158.
- The handicrafts and souvenirs index is ranked fourth with a weight of 0.158.
- The index of the presence of a sense of belonging to a neighborhood among residents with a weight of 0.156 is ranked fifth.
- The index of the presence of identity elements in the place with a weight of 0.109 is ranked sixth.

The inconsistency rate of the comparisons made was found to be 0.072, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.10. Determining the priority of sub-criteria and environmental and natural potentials

The calculations performed to determine the priority of environmental sub-criteria are presented in **Table 12**.

Table 12. Determining the priority of natural and environmental sub-criteria.

Code	Criterion	S31	S32	S33	S34	Geometric mean	Eigenvector
S31	Eel Goli park and gardens	1.000	1.487	0.669	0.770	0.935	0.233
S32	Mountains and caves	0.673	1.000	0.851	1.127	0.896	0.223
S33	Mehraneh River, waterfalls and springs	1.495	1.175	1.000	1.073	1.172	0.291
S34	Arsbaran forest, Kandavan	1.299	0.887	0.932	1.000	1.018	0.253

Based on the special vector obtained,

- The index of the Mehraneh River, waterfalls, and springs is ranked first with a weight of 0.291.
- Arsbaran Forest Index, Kandavan, is ranked second with a weight of 0.253.
- The index of Eel Goli Park and Gardens is ranked third with a weight of 0.233.
- The index of mountains and caves is ranked fourth, with a weight of 0.223.

The inconsistency rate of the comparisons made was found to be 0.025, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.11. Determining the priority of sub-criteria and physical and infrastructural potentials of Tabriz City

The calculations performed to determine the priority of physical sub-criteria are presented in **Table 13**.

Table 13. Determining the priority of physical and infrastructure sub-criteria.

Code	Criterion	S41	S42	S43	S44	S45	Geometric mean	Eigenvector
S41	The existence of a historical body in the city	1.000	1.206	0.748	2.025	0.851	1.092	0.215
S42	The existence of tourism hardware (complexes, airport)	0.829	1.000	0.903	1.975	1.541	1.179	0.232
S43	Service and business centers	1.337	1.108	1.000	0.567	0.512	0.845	0.166
S44	Access to transportation	0.494	0.506	1.764	1.000	0.615	0.770	0.152
S45	Roads and passages	1.175	0.649	1.953	1.626	1.000	1.193	0.235

Based on the special vector obtained,

- The index of roads and passages is ranked first, with a weight of 0.235.
- The index of the presence of tourism hardware (complexes, airports) with a weight of 0.232 has been ranked second.
- The historical corpse index in the city is ranked third, with a weight of 0.215.
- The index of service and commercial centers with a weight of 0.166 has been ranked fourth.
- The transportation accessibility index, with a weight of 0.152, has been ranked fifth.

The inconsistency rate of the comparisons made was found to be 0.070, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.12. Determining the priority of the historical and architectural sub-criteria of Tabriz City

The calculations performed to determine the priority of historical and architectural sub-criteria are presented in **Table 14**.

Table 14. Determining the priority of historical and architectural sub-criteria.

Code	Criterion	S51	S52	S53	S54	S55	S56	Geometric mean	Eigenvector
S51	Old texture with traditional architecture (houses, mosques, etc.)	1.000	1.058	0.553	1.033	1.563	0.605	0.911	0.151
S52	The existence of tombs and towers and citadels	0.945	1.000	1.187	0.910	1.433	0.898	1.047	0.174
S53	Markets and timchehs	1.808	0.843	1.000	0.437	1.209	1.069	0.975	0.162
S54	Churches and caravanserais	0.968	1.098	2.289	1.000	0.699	1.269	1.137	0.189
S55	Shrines and shrines	0.640	0.698	0.827	1.430	1.000	1.736	0.985	0.164
S56	Historical elements and elements such as bridges	1.653	1.114	0.936	0.788	0.576	1.000	0.960	0.160

Based on the special vector obtained,

- The index of churches and caravanserais is ranked first with a weight of 0.189.
- The index of the presence of tombs, towers, and citadels with a weight of 0.174 is ranked second.
- The index of shrines and imamzadehs is ranked third, with a weight of 0.164.
- The Markets and Timchehs index, with a weight of 0.162, is ranked fourth.
- The index of historical elements and elements such as bridges is ranked fifth with a weight of 0.16.
- The old texture index with traditional architecture (houses, mosques, etc.) is ranked sixth with a weight of 0.151.

The inconsistency rate of the comparisons made is 0.056, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.13. Determining the priority of the sub-criteria of the national recognition component

The calculations performed to determine the priority of national recognition sub-criteria are presented in **Table 15**.

Table 15. Determining the priority of national recognition sub-criteria.

Code	Criterion	S61	S62	S63	S64	S65	S66	Geometric mean	Eigenvector
S61	Has historical and political experience at the national level	1.000	0.868	0.561	1.053	0.450	0.789	0.753	0.122
S62	The city of the first	1.152	1.000	0.659	0.732	1.418	0.466	0.846	0.138
S63	Tabriz carpets and leather (the world city of carpet weaving)	1.784	1.517	1.000	2.156	0.831	0.605	1.197	0.195
S64	Wide variety of souvenirs and food products	0.950	1.367	0.464	1.000	1.104	0.686	0.877	0.143
S65	A city without beggars	2.222	0.705	1.203	0.906	1.000	0.798	1.053	0.171
S66	The safest metropolis in the country	1.267	2.145	1.653	1.458	1.253	1.000	1.420	0.231

Based on the special vector obtained,

- The index of the safest metropolis in the country is ranked first, with a weight of 0.231.
- The carpet and leather index of Tabriz (the world city of carpet weaving) neighborhood, with a weight of 0.195, is ranked second.
- The index of the city without neighborhood beggars is ranked third, with a weight of 0.171.
- The index of great diversity in souvenirs and food products in the neighborhood is ranked fourth with a weight of 0.143.
- The index of the city of Olinha neighborhood is 0.138 and is ranked fifth.
- The index with historical and political experiences at the national level is ranked 6th with a weight of 0.122.

The inconsistency rate of the comparisons made was found to be 0.038, which is smaller than 0.1, and therefore the comparisons made can be trusted.

5.14. Determining the priority of scientific and academic sub-criteria

The calculations performed to determine the priority of scientific and academic sub-criteria are presented in **Table 16**.

Table 16. Participation table: Determining the priority of scientific and academic sub-criteria.

Code	Criterion	S71	S72	S73	S74	S75	Geometric mean	Eigenvector
S71	Tabriz is an academic city	1.000	1.975	1.541	0.567	0.512	0.976	0.192
S72	University diversity	0.506	1.000	0.615	1.206	0.748	0.776	0.153
S73	Existence of elite people (professors and students)	0.649	1.626	1.000	2.025	0.851	1.127	0.222
S74	The existence of knowledge-based companies	1.764	0.829	0.494	1.000	0.903	0.918	0.181
S75	Science and Technology Park	1.953	1.337	1.175	1.108	1.000	1.277	0.252

Based on the special vector obtained,

- The science and technology park index is ranked first with a weight of 0.252.
- The index of the existence of elite people (professors and students) with a weight of 0.222 is ranked second.
- Tabriz is a university city with a weight of 0.192 and is ranked third.
- The index of existence of knowledge-based companies with a weight of 0.181 has been ranked fourth.
- The university diversity index, with a weight of 0.153, is ranked fifth.

The inconsistency rate of the comparisons made was found to be 0.092, which is smaller than 0.1, and therefore the comparisons made can be trusted.

6. The pattern of relationships between sub-criteria with the DEMATEL technique

In order to reflect the internal relationships between the sub-criteria, the dimetal technique has been used.

Calculation of the direct correlation matrix: because several experts have been used, the arithmetic mean of the opinions has been used, and the direct correlation matrix, or X, has been formed.

Calculation of the normal direct correlation matrix: First, the sum of all rows and columns is calculated, and the value of k is determined. The largest number is 75.77, and all the values of the direct correlation matrix are divided by this number to make the matrix normal.

$$k = \max \left\{ \max \sum_{j=1}^n x_{ij}, \sum_{i=1}^n x_{ij} \right\} = 75.77 \quad (12)$$

$$N = \frac{1}{75.77} * X \quad (13)$$

Calculation of the complete correlation matrix: To calculate the complete correlation matrix, first the same matrix (I) is formed. Then we subtract the same matrix from the normal matrix and invert the resulting matrix. Finally, we multiply the normal matrix by the inverse matrix:

$$T = N(I - N)^{-1} \quad (14)$$

Displaying the subcriteria network relationship map: To determine the network relationship map (NRM), the threshold value must be calculated. With this method, partial relationships can be ignored, and the network of significant relationships can be drawn. In this section, the threshold value equal to 1.925 has been obtained. According to the relationship pattern, the causal form can be drawn based on **Table 17**.

Table 17. The pattern of causal relationships of the main criteria of the model.

Research indicators	D	R	D + R	D - R
S11	35.687	36.916	72.603	-1.228
S12	37.521	37.674	75.195	-0.154
S13	36.571	36.474	73.045	0.097
S14	36.165	37.406	73.570	-1.241
S15	37.459	39.276	76.735	-1.817
S16	38.452	37.145	75.597	1.307
S21	36.290	36.994	73.283	-0.704
S22	37.221	36.885	74.106	0.337
S23	36.119	37.248	73.367	-1.130
S24	36.153	36.450	72.603	-0.297
S25	38.258	38.488	76.747	-0.230
S26	36.550	37.940	74.490	-1.390
S31	36.503	38.849	75.352	-2.345
S32	37.077	37.141	74.217	-0.064
S33	37.948	37.877	75.824	0.071
S34	37.048	37.944	74.992	-0.896
S41	37.157	37.544	74.702	-0.387
S42	36.767	37.756	74.523	-0.989
S43	37.517	38.012	75.529	-0.496
S44	37.266	36.701	73.967	0.565
S45	37.417	37.517	74.934	-0.100
S51	38.546	37.082	75.628	1.464
S52	36.528	36.622	73.149	-0.094
S53	37.353	38.194	75.547	-0.840
S54	37.958	35.825	73.783	2.133
S55	36.886	37.339	74.225	-0.453
S56	38.868	37.384	76.252	1.485
S61	37.216	36.717	73.932	0.499
S62	37.937	37.441	75.378	0.495
S63	36.368	35.814	72.181	0.554
S64	36.562	36.547	73.109	0.014
S65	37.358	37.648	75.006	-0.289
S66	38.127	37.757	75.884	0.370
S71	37.342	36.727	74.068	0.615
S72	38.243	38.111	76.354	0.131
S73	37.543	36.802	74.344	0.741
S74	39.263	36.489	75.751	2.774
S75	37.936	36.447	74.383	1.489

Figure 5 shows the cartesian coordinate form of DEMATEL output for sub-criteria.

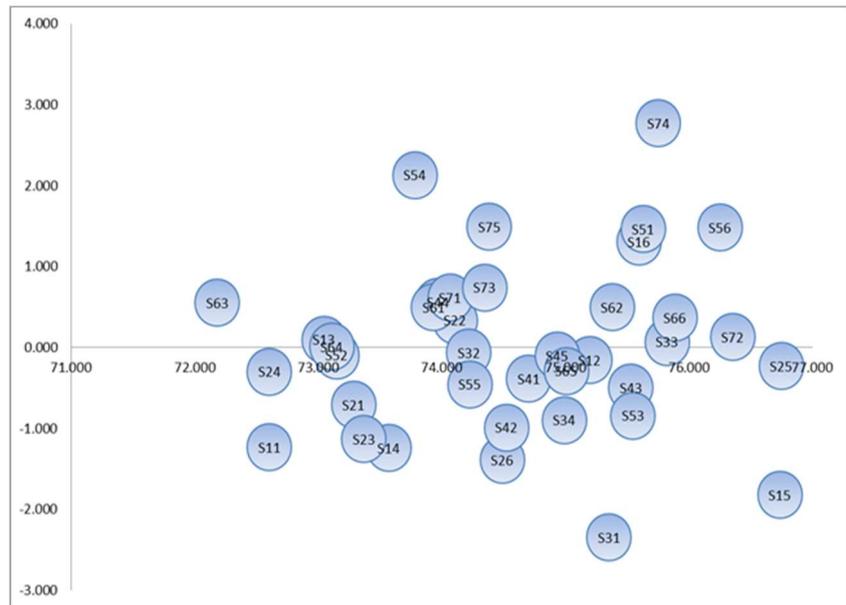


Figure 5. Cartesian coordinate form of DEMATEL output for sub-criteria.

6.1. Determining the final weight under Tabriz urban tourism brand criteria with the ANP technique

Calculation of unbalanced supermatrix, balanced supermatrix, and limit supermatrix:

To determine the final weight, the output of the comparison of the main criteria of the urban tourism brand based on the objective and internal relationships between the criteria is presented in a supermatrix. This supermatrix is called primary or unbalanced supermatrix. According to the relationships identified in the present study, the initial super matrix of this study will be as follows:

$$W = \begin{bmatrix} 0 & 0 & 0 \\ W_{21} & W_{22} & 0 \\ 0 & W_{32} & W_{33} \end{bmatrix} \quad (15)$$

In this supermatrix, the W_{21} vector shows the importance of each of the main criteria based on the goal. The vector W_{22} represents the pairwise comparison of the relationships between the main criteria derived from the output of the DEMATEL technique. The W_{32} vector shows the importance of each sub-criteria in its respective cluster. The vector W_{33} shows the pairwise comparison of relationships between sub-criteria. Zero coefficients also indicate that the factors have no effect on each other at the intersection of rows and columns. Using the concept of normalization, the unbalanced supermatrix is transformed into a balanced (normalized) supermatrix. In a balanced supermatrix, the sum of the elements of all the columns is equal to 1.

The next step is to calculate the limit supermatrix. The limit supermatrix is obtained by exponentiating all elements of the balanced supermatrix. This operation is repeated until the elements of the supermatrix converge to a similar value. In this case, all the ratios related to each criterion will be a fixed and identical number. The final priority of the main criteria is drawn from the limit supermatrix in **Table 18**.

Table 18. Final priority of elements with ANP technique.

Research indicators	Normal weight	Rank
S11 A market with a unique economic function	0.0264	18
S12 Empowering residents and entrepreneurship in the field of tourism	0.0255	37
S13 Economic prosperity of the city	0.0258	28
S14 The communication, political, and commercial center of the northwest region	0.0255	35
S15 The presence of suitable economic capital in the city	0.0252	38
S16 The existence of jobs related to tourism	0.0258	29
S21 Social and cultural identity of the city (celebrities, music)	0.0277	1
S22 The presence of identity elements	0.0263	21
S23 Special customs in the city (food styles, etc.)	0.0270	6
S24 High social capital	0.0255	36
S25 Creating a sense of neighborhood belonging among the residents	0.0270	5
S26 Handicrafts and souvenirs	0.0258	30
S31 Eel Goli park and gardens	0.0258	32
S32 Mountains and caves	0.0262	24
S33 Mehraneh River, waterfalls and springs	0.0268	9
S34 Arsbaran forest, Kandavan	0.0261	25
S41 The existence of a historical body in the city	0.0274	2
S42 The existence of tourism hardware (complexes, airport)	0.0259	27
S43 Service and business centers	0.0265	14
S44 Access to transportation	0.0263	20
S45 Roads and passages	0.0264	16
S51 Old texture with traditional architecture (houses, mosques, etc.)	0.0272	3
S52 The existence of tombs and towers and citadels	0.0258	31
S53 Markets and timchehs	0.0269	7
S54 Churches and caravanserais	0.0268	8
S55 Shrines and shrines	0.0260	26
S56 Historical elements and elements such as bridges	0.0262	23
S61 Has historical and political experience at the national level	0.0263	22
S62 The city of the first	0.0268	10
S63 Tabriz carpets and leather (the world city of carpet weaving)	0.0257	33
S64 Wide variety of souvenirs and food products	0.0271	4
S65 A city without beggars	0.0264	17
S66 The safest metropolis in the country	0.0268	11
S71 Tabriz is an academic city	0.0263	19
S72 University diversity	0.0265	13
S73 Existence of elite people (professors and students)	0.0265	12
S74 The existence of knowledge-based companies	0.0256	34
S75 Science and Technology Park	0.0264	15

As shown in **Figure 6**, the social and cultural identity index of Tabriz City, encompassing elements such as celebrities and music, holds significant weight with a normalized value of 0.0277. Equally noteworthy is the presence of historical entities within the city, contributing to a normalized weight of 0.0274. The preservation of the old context characterized by traditional architecture, including houses and mosques, carries a substantial normalized weight of 0.0272.

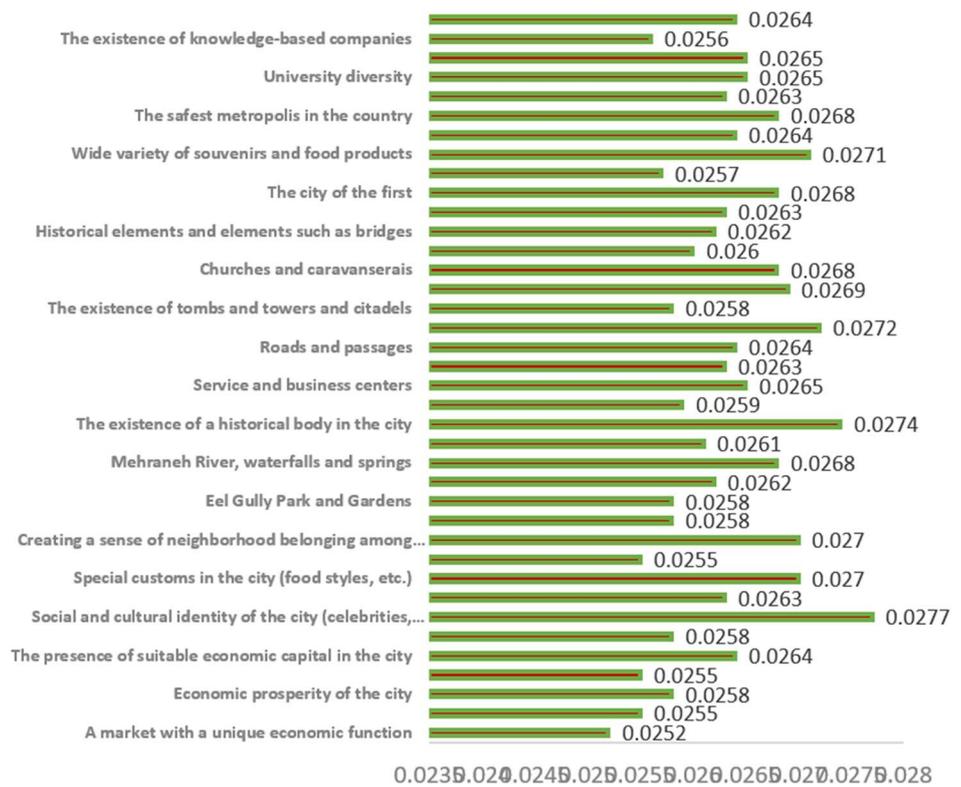


Figure 6. The final priority of the criteria and sub-criteria of the capabilities and potentials of urban tourism in Tabriz with the approach of improving the image and personality of the brand with the ANP technique.

Additionally, the city’s appeal is heightened by the great variety of souvenirs and food products, attaining a normalized weight of 0.0271. The establishment of a sense of belonging to a neighborhood among residents holds considerable importance, reflecting a normalized weight of 0.0270. Furthermore, the existence of unique customs in the city, such as distinctive food styles, maintains a normalized weight of 0.0270.

These indicators collectively underscore the pivotal aspects contributing to the social and cultural identity of Tabriz City. Among them, celebrities, music, historical entities, traditional architecture, diverse souvenirs and food products, a sense of neighborhood belonging, and distinct local customs emerge as the most influential factors in shaping the city’s identity.

7. Conclusion

In recent decades, the significance of destination branding in the realm of tourism has garnered considerable attention. In the fiercely competitive global market, destinations must establish a unique identity to distinguish themselves from competitors. The success of branding for tourism destinations hinges on showcasing their inherent potentials and talents, making them irreplaceable in the eyes of travelers. In today’s landscape, where numerous destinations offer similar comforts and entertainment options, it is no longer sufficient for a city, province, or country to

merely be known and experienced by tourists. Instead, it must craft a distinct and compelling image, positioning itself as a top travel choice amid intense competition.

The findings of the research underscore that the city of Tabriz possesses unique strengths, capacities, and untapped tourism potential. While many of these capacities remain overlooked and unfamiliar, each year witnesses a significant influx of tourists from across the country, drawn by the allure of Tabriz's tourist attractions. Notably, cultural attractions take precedence, followed by historical landmarks, emerging as key components that can shape the city's brand.

Within Tabriz, cultural attractions, including museums and galleries, and historical sites such as old houses and bridges, stand out as pivotal elements that could serve as symbols of the city and contribute to its historical tourism appeal. The examination of the city's tourism potential reveals a distinctive prowess in cultural, traditional, historical, and architectural domains.

Detailed analysis further highlights Tabriz's potential to establish itself as a city brand through historical places, architectural diversity, cultural celebrities, and cultural museums. The tourist ambiance in Tabriz is profoundly influenced by its rich cultural and historical milieu. Consequently, the cultural and historical attractions emerge as the key elements capable of creating a unique and compelling image for Tabriz, encouraging tourists to prioritize it as their preferred travel destination amidst the plethora of choices available.

Conflict of interest: The authors declare no conflict of interest.

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