



Investigating the Relationships Between the Effective Factors in Creating Food Tourism Brand in Shiraz

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Abstract

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The present research investigates the factors that effectively create a food tourism brand in Shiraz. The statistical population includes all the experts in tourism and hotel management, food, cooking, and the restaurant industry, as well as tourists, who were selected using the purposeful sampling method. There are 13 factors identified according to the research literature. The relationships between these factors were determined using the Fuzzy DEMATEL method by this selected expert. The results show that “investment in food tourism” and “using new advertising tools” are the most critical factors in creating a food tourism brand in Shiraz.

It is shown that food quality and food authenticity are the most influential factors. Food tourism branding is the most critical issue that should be considered in Shiraz. It is possible to see Shiraz food as an intangible cultural heritage to the national register, prepare their files for global registration in UNESCO, and conduct cultural consultations to present them internationally.

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Introduction

The importance of the connection between food and tourism should not be ignored. Food affects travelers' decisions while choosing their destination. Food is an essential factor in attracting tourists. Food not only provides nutrition, but it also has emotional effects. Tourism helps regional development, and people also benefit from tourism. Other benefits of food tourism are business opening, foundational development, and economic growth (Ellis et al., 2018). The mental image of food tourism is one of the most important topics that can be discussed in marketing research, so many countries use promotional and global marketing tools to support their tourism image and compete with others (Bogicevic et al., 2019). The role of food in tourism is an essential factor in tourism studies. Food plays an important role in selecting tourist destinations (Nield et al., 2000).

The role of food in tourism has significantly increased in recent years. Food imagination in the mind of tourists is closely related to a specific destination and the food quality. Nowadays, many people travel specifically to experience different foods (Afshar Faramarzi et al., 2019).

The management of demand for tourism is very important. Making a food brand tourism can express the cultural values of the destination (Haqvardi Lo, 2022). The brand is communication between customers and local people. A food tourism destination is successful when tourists revisit these destinations. Brand architecture, identity, image, and quality create commitment for visitors. Food tourism branding plays a key role in creating excellence for the food tourism product or destination (Douzande Ziabri et al., 2021).

Not enough research on food tourism branding has been carried out in Iran, and this study can be one of the most important novelties. This research has investigated the factors influencing the creation of a food tourism brand in Shiraz. Food tourism branding is an important advertising tool that can improve Shiraz's image. Shiraz is a city in south-central Iran known for its literary history, many tourist attractions, and traditional foods.

Literature Review

Food tourism

Food is considered one of the essential elements of a tourism experience. However, as an integral part of the experience, it has been studied as a subject in recent years. Traveling is closely related to lifestyle, including experiencing and learning from different cultures and gathering knowledge by eating about the quality or characteristics of special foods produced in the visited areas. The tourism industry has always tried to give visitors new experiences. Service sectors claim they have entered a new economic era (Imanzadeh & Abdi Dailari, 2021).

Food is an important factor in attracting tourists. The relationship between food and tourism also plays a crucial role in local economic development. Food helps a brand to be formed to support local cultural events. Cooking has become increasingly important in tourism as the economy has developed. Food provides a foundation for tourism through cross-cultural communication and tourism, the development of food experience, the production of distinctive foods, the development of critical infrastructure for food production and consumption, and the support of local cultures. The World Tourism Organization reported that consumers are not willing to pay for public services but are eager to pay for a complete experience (Hwang et al., 2021). People are willing to pay for the added value the food industry offers. Tourists are looking for authenticity in food. The tourism industry has traditionally offered travelers accommodations specified services to visitors, and sought to provide more customer-friendly and unique experiences (Laleh Rudi et al., 2021).

There is much global competition between nations, regions, and communities to gain market in tourism. Tourists usually face a set of similar and replaceable options to choose a destination. Therefore, presenting a solid identity and positive image has become one of the most important marketing strategies in building and creating a competitive advantage. If destinations aspire to build a strong identity in the minds of tourists, they should offer their motivational attractions. Food with a strong national or regional identity is a means to meet the evolving needs of contemporary tourists. As food tourism is gaining importance, food is a significant element in destination marketing strategies (du Rand & Heath, 2006). Recent studies have found that food can also elevate the identity of destinations strongly related to ways of life (Everett & Aitchison, 2008).

Branding in food tourism

The idea of sensory branding is the most acceptable to humans. Participating in the three senses of touch, smell, and taste in branding is a proven way to differentiate the brand. Therefore, sensory branding is used more than its traditional application and positively impacts effective marketing. The most complicated part of managing sensory branding is creating the interaction between design management processes with business management and classic marketing. In such projects, there are two completely different ways of thinking: creative and artistic, engineering and mathematics. Close coordination between design managers and business managers in the organization plays a vital role in the success of sensory branding. Tourism branding was proposed when tourism was introduced as an industry. Tourism branding means evoking the cultural identity of space and place in the minds of potential tourists. Tourism branding is done in the destination and introduces the culture and identity of that place (Jokar, 2022).

Food tourism is very competitive in global marketing. This economic process has emerged as an example of a creative economy, most related to tourism development. Recently, Horng et al. (2012) shed light on the meaning of branding in food tourism, studying brand loyalty to identify considerable influences of brand image and perceived value on travel intention. Horng et al. (2012) show that food tourism profited from the stable demonstration of image to intention. Food branding activities increase the number of destinations. Therefore, food is a powerful tool for branding a place, which creates and expands the experience and taste of a place. Branding strategies, local markets, and comprehensive branding practices are still relatively rare globally. The tourism industry has always been related to and involved with branding places and introducing their places and countries to the world (Fazli, 2021). According to the basics as mentioned earlier, the research question can be presented as follows:

What is the relationship between the effective factors in creating a food tourism brand in Shiraz?

The research results on food tourism using decision methods are expressed as follows. Ghanbari et al. (2022) researched the Role of Marketing in food tourism, and the case study was managers of hotels and restaurants in Tabriz. The results of the model for investigating the role of marketing in food tourism from the perspective of restaurant management show that the mixed model of promotion marketing has the most significant impact on the development factors of food tourism.

Chauhan et al. (2022) researched cultural tourism's role in developing food tourism branding (study of Jansar, a belief of a tribal land).

This study says that food and cultural tourism improves both domestic and economic tourism.

A new study has demonstrated the Constructive and influential role of food tourism in sustainable development at the regional level. The research results show that food diversity, marketing, urban management, cultural diversity, and urban vitality are influential factors in creating and managing the food tourism brand in Rasht. Economic opportunities were recognized as one of the most important factors resulting from effective branding management (Fazli, 2021).

A new study was carried out in the East Nusa Tenggara (NTT) Province of Indonesia using.

The hybrid MCDM approach combines DEMATEL analysis and the Fuzzy TOPSIS techniques. A valuable blueprint of regional destination competitiveness criteria that offers necessary inputs for developing medium and long-term tourism strategies is developed (Bire et al., 2021).

Cheshm Fasa et al. (2020) carried out a study on food tourism as an Option for the sustainable development of Destinations. The results of the research illustrate that food tourism has an impact on six components, including the in-depth acquaintance of tourists with the culture of the host society, preservation and dissemination of local cuisine, development of indigenous agriculture, increasing

destination attractions, creating stable incomes, and increasing the self-confidence of residents, which can lead to the sustainable development of tourism destinations.

Yue and Tang (2022) conducted research on the Impact of brand image and Service Quality on customer satisfaction and food tourism branding on the sustainable development of food tourism in Macao, one of the most advanced cities in tourism. This study also makes some suggestions for the sustainable development of Macao food tourism.

In 2017 Tsai and Wang conducted research titled experiential value in food tourism branding. The results show that return on investment can significantly enhance a food destination's image. This study also identifies recommendations for food tourism branding. Wang (2015) researched the positive Impact of social media Advertising on food tourism branding in Macao. Social media advertising has a significant positive relation with the image of food tourism.

Our intention in this research is to investigate factors in creating food tourism brands in Shiraz using the fuzzy DEMATEL technique, which has never been used in other studies.

Materials and methods

This research is applied in terms of purpose because it investigates theoretical constructions in real and practical contexts and situations and identifies the factors affecting food tourism in Shiraz City. This research is conducted with a combined method based on survey and descriptive-analytical methods. In addition, the research is qualitative and is called field research. The statistical population of the research includes all experts in tourism and hotel management, the food industry, cooking and restaurant management, and tourism. In this section, the statistical population should have the following characteristics:

- Having at least a master's degree in tourism.
- At least ten years of work experience in the tourism or food and catering industry.

The sampling method was purposeful in selecting specific samples with much information about the subject. Snowball is a type of Purposeful sampling. This sampling method is used when the population is limited in general. The sample size is between 5 to 30 people (Habibi et al., 2014).

Therefore, there are limitations in selecting experts and specialists. This research selects ten qualified people as a sample to compare the Fuzzy DEMATEL method questionnaire. The researcher selected these people to visit the cultural heritage and several hotels and destinations.

This study collected data from reliable scientific and research sites, literature, and field studies. First, the literature studies method helps us create a theoretical framework. A questionnaire was prepared to identify the factors influencing food tourism development based on the Fuzzy DEMATEL method. The questionnaire included 13 factors and was conducted from 2021 to 2022.

These factors were designed in a 13x13 matrix Table to give the experts rating factors from zero to four. The Lincoln and Goba evaluation method has been used to analyze the matrix.

In this step, four criteria of acceptability, reliability, transferability, and confirmability were used for validity and reliability. The results were provided to tourism experts, and the reliability and validity of the examined items were confirmed.

All the factors considered in the questionnaire are compared with each other. In this study, the Fuzzy DEMATEL method was used to identify the influential factors on the branding of food tourism.

Findings

Ten experts were asked to help evaluate the factors affecting the creation of the food tourism brand in Shiraz. These people are the successful managers of the top 10 restaurants in Shiraz. Each of these people independently rated the Table provided to them without knowing their colleagues' answers. After collecting the questionnaires, the causal relationships between the factors were determined using the Fuzzy DEMATEL method.

These factors include:

1. Advertising
2. Food quality
3. Trained human resources
4. Organic food
5. Price
6. Cooking style
7. Authenticity
8. Brand design
9. Making people aware of the brand
10. Brand trust
11. Creating a good feeling toward the brand
12. Product variation
13. Investment in food tourism

These Tables are shown below. Table 2 is calculated to represent the average of the previous ten tables to start the analysis process.

Table 1. An average of ten experts

Average	A	B	C	D	E	F	G	H	I	J	K	L	M																											
A	0	0	0	72	82	86	31	4	49	72	82	86	66	76	83	74	84	87	26	34	42	68	78	84	7	8	85	7	8	85	7	8	85	68	78	82	76	86	88	94.2
B	2	24	27	0	0	0	52	62	69	68	78	84	72	82	86	74	84	87	72	82	86	14	18	22	18	24	3	23	3	37	21	28	35	18	24	3	7	8	85	678
C	25	32	39	62	72	79	0	0	0	17	24	31	2	26	32	2	26	32	16	22	28	15	2	25	16	22	28	7	8	85	68	78	84	16	22	28	66	76	83	574
D	2	26	32	72	82	85	64	74	81	0	0	0	68	78	83	14	18	22	21	28	35	15	2	25	17	22	27	15	2	25	17	24	31	22	28	33	63	72	77	556
E	66	76	83	51	6	67	27	36	44	7	8	83	0	0	0	58	68	75	52	62	7	36	46	56	16	22	28	24	38	48	57	35	44	53	74	84	87	737		
F	26	36	46	52	62	7	68	78	82	24	32	39	68	78	84	0	0	0	68	78	84	25	34	43	14	18	22	22	3	38	14	18	22	17	22	27	68	78	84	641
G	34	44	56	56	66	74	21	26	3	2	24	27	26	32	37	64	74	81	0	0	0	14	18	22	15	2	25	45	54	62	23	3	37	18	26	34	68	78	83	568
H	58	68	76	56	66	73	15	2	25	2	24	27	19	26	33	25	32	39	42	52	6	0	0	0	18	24	3	23	32	41	19	26	33	56	66	73	74	84	87	587
I	68	78	82	64	74	81	6	7	77	22	28	33	2	26	32	29	38	46	29	38	46	36	46	56	0	0	0	66	76	82	66	76	82	27	36	45	72	82	86	748
J	66	76	82	74	84	87	68	78	82	25	32	38	26	32	37	25	32	38	68	78	84	52	62	71	74	84	87	0	0	0	7	8	85	24	32	4	7	8	85	816
K	36	44	5	72	82	86	7	8	84	52	62	69	66	76	83	7	8	85	74	84	87	66	76	81	68	78	84	66	76	82	0	0	0	35	44	52	64	74	82	925
L	26	34	42	28	38	48	2	28	36	26	34	41	21	28	35	27	34	4	2	26	32	22	28	34	2	26	32	17	24	31	19	24	29	0	0	0	76	86	88	488
M	7	8	85	66	76	82	18	24	3	58	68	76	64	74	81	66	76	83	68	78	84	41	5	57	62	72	78	7	8	84	49	58	64	36	44	5	0	0	0	854

In Table 2, the average is normalized. For normalization, the sum of the third column of each parameter in each row is calculated. Finally, the most significant number is selected among the numbers obtained in each row, and the total data is divided by this number. According to the above Table, the number 94.2 is obtained.

Table 2. Normalized

Normalized (H)	A	B	C	D	E	F	G	H	I	J	K	L	M	94.2																										
A	0	0	0	0.076463	0.087049	0.091295	0.032939	0.040463	0.052017	0.076463	0.087049	0.091295	0.070084	0.086779	0.08811	0.078556	0.089172	0.092957	0.076701	0.082893	0.044536	0.072287	0.082893	0.089172	0.074921	0.094926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2		
B	0.021291	0.025478	0.028662	0	0	0	0.055202	0.063287	0.073498	0.072287	0.082893	0.086779	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0.076701	0.082893	0.044536	0.072287	0.082893	0.089172	0.074921	0.094926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2		
C	0.026528	0.03287	0.041402	0.063287	0.074921	0.086779	0	0	0	0.028662	0.034907	0.042862	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	94.2	
D	0.021291	0.025478	0.028662	0.063287	0.074921	0.086779	0	0	0	0.028662	0.034907	0.042862	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	0.028662	0.021291	0.025478	94.2	
E	0.070084	0.086779	0.08811	0.044536	0.052017	0.063287	0.076463	0.087049	0.091295	0	0	0	0.070084	0.086779	0.08811	0.044536	0.052017	0.063287	0.076463	0.087049	0.091295	0	0	0	0.070084	0.086779	0.08811	0.044536	0.052017	0.063287	0.076463	0.087049	0.091295	0	0	0	0.070084	0.086779	0.08811	94.2
F	0.027481	0.03287	0.040463	0.052017	0.063287	0.073498	0.072287	0.082893	0.089172	0	0	0	0.027481	0.03287	0.040463	0.052017	0.063287	0.073498	0.072287	0.082893	0.089172	0	0	0	0.027481	0.03287	0.040463	0.052017	0.063287	0.073498	0.072287	0.082893	0.089172	0	0	0	0.027481	0.03287	0.040463	94.2
G	0.03609	0.04678	0.05948	0.05948	0.070084	0.078556	0.022293	0.027481	0.034907	0.021291	0.025478	0.028662	0.02017	0.027481	0.03287	0.03997	0.044536	0.052017	0.063287	0.073498	0.072287	0.082893	0.089172	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2			
H	0.063287	0.072287	0.086779	0.05948	0.063287	0.073498	0.072287	0.082893	0.089172	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0	0	0	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2		
I	0.072287	0.082893	0.087049	0.063287	0.073498	0.086779	0.072287	0.082893	0.089172	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0	0	0	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2		
J	0.070084	0.086779	0.08811	0.044536	0.052017	0.063287	0.076463	0.087049	0.091295	0	0	0	0.070084	0.086779	0.08811	0.044536	0.052017	0.063287	0.076463	0.087049	0.091295	0	0	0	0.070084	0.086779	0.08811	0.044536	0.052017	0.063287	0.076463	0.087049	0.091295	0	0	0	0.070084	0.086779	0.08811	94.2
K	0.03287	0.04678	0.05948	0.05948	0.070084	0.078556	0.022293	0.027481	0.034907	0.021291	0.025478	0.028662	0.02017	0.027481	0.03287	0.03997	0.044536	0.052017	0.063287	0.073498	0.072287	0.082893	0.089172	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2			
L	0.027481	0.03287	0.040463	0.052017	0.063287	0.073498	0.072287	0.082893	0.089172	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0	0	0	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2		
M	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.089172	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0	0	0	0.076463	0.087049	0.091295	0.078556	0.089172	0.092957	0.074921	0.084926	0.092824	0.074921	0.084926	0.092824	0.072287	0.082893	0.087049	0.091295	0.094926	0.091295	0.094926	94.2		

As observed in the normalized matrix, each parameter has three factors, and these three factors become three independent matrices. HL is the left factor, HM is the middle factor, and HU is the right factor of the normalized matrix. Therefore, three matrices with the mentioned names are obtained.

Table 3. HL matrix

HL	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0	0.076433	0.032909	0.076433	0.070064	0.078556	0.027601	0.072187	0.07431	0.07431	0.07431	0.072187	0.080679
B	0.021231	0	0.055202	0.072187	0.076433	0.078556	0.076433	0.014862	0.019108	0.024416	0.022293	0.019108	0.07431
C	0.026539	0.065817	0	0.018047	0.021231	0.021231	0.016985	0.015924	0.016985	0.07431	0.072187	0.016985	0.070064
D	0.021231	0.076433	0.067941	0	0.072187	0.014862	0.022293	0.015924	0.018047	0.015924	0.018047	0.023355	0.066879
E	0.070064	0.05414	0.028662	0.07431	0	0.061571	0.055202	0.038217	0.016985	0.023355	0.04034	0.037155	0.078556
F	0.027601	0.055202	0.072187	0.025478	0.072187	0	0.072187	0.026539	0.014862	0.023355	0.014862	0.018047	0.072187
G	0.036093	0.059448	0.022293	0.021231	0.027601	0.067941	0	0.014862	0.015924	0.047771	0.024416	0.019108	0.072187
H	0.061571	0.059448	0.015924	0.021231	0.02017	0.026539	0.044586	0	0.019108	0.024416	0.02017	0.059448	0.078556
I	0.072187	0.067941	0.063694	0.023355	0.021231	0.030786	0.030786	0.038217	0	0.070064	0.070064	0.028662	0.076433
J	0.070064	0.078556	0.072187	0.026539	0.027601	0.026539	0.072187	0.055202	0.078556	0	0.07431	0.025478	0.07431
K	0.038217	0.076433	0.07431	0.055202	0.070064	0.07431	0.078556	0.070064	0.072187	0.070064	0	0.037155	0.067941
L	0.027601	0.029724	0.021231	0.027601	0.022293	0.028662	0.021231	0.023355	0.021231	0.018047	0.02017	0	0.080679
M	0.07431	0.070064	0.019108	0.061571	0.067941	0.070064	0.072187	0.043524	0.065817	0.07431	0.052017	0.038217	0

Table 4. HM matrix

HM	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0	0.087049	0.042463	0.087049	0.080679	0.089172	0.036093	0.082803	0.084926	0.084926	0.084926	0.082803	0.091295
B	0.025478	0	0.065817	0.082803	0.087049	0.089172	0.087049	0.019108	0.025478	0.031847	0.029724	0.025478	0.084926
C	0.03397	0.076433	0	0.025478	0.027601	0.027601	0.023355	0.021231	0.023355	0.084926	0.082803	0.023355	0.080679
D	0.027601	0.087049	0.078556	0	0.082803	0.019108	0.029724	0.021231	0.023355	0.021231	0.025478	0.029724	0.076433
E	0.080679	0.063694	0.038217	0.084926	0	0.072187	0.065817	0.048832	0.023355	0.029724	0.050955	0.046709	0.089172
F	0.038217	0.065817	0.082803	0.03397	0.082803	0	0.082803	0.036093	0.019108	0.031847	0.019108	0.023355	0.082803
G	0.046709	0.070064	0.027601	0.025478	0.03397	0.078556	0	0.019108	0.021231	0.057325	0.031847	0.027601	0.082803
H	0.072187	0.070064	0.021231	0.025478	0.027601	0.03397	0.055202	0	0.025478	0.03397	0.027601	0.070064	0.089172
I	0.082803	0.078556	0.07431	0.029724	0.027601	0.04034	0.04034	0.048832	0	0.080679	0.080679	0.038217	0.087049
J	0.080679	0.089172	0.082803	0.03397	0.03397	0.03397	0.082803	0.065817	0.089172	0	0.084926	0.03397	0.084926
K	0.046709	0.087049	0.084926	0.065817	0.080679	0.084926	0.089172	0.080679	0.082803	0.080679	0	0.046709	0.078556
L	0.036093	0.04034	0.029724	0.036093	0.029724	0.036093	0.027601	0.029724	0.027601	0.025478	0.025478	0	0.091295
M	0.084926	0.080679	0.025478	0.072187	0.078556	0.080679	0.082803	0.053079	0.076433	0.084926	0.061571	0.046709	0

Table 5. HU matrix

HU	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0	0.091295	0.052017	0.091295	0.08811	0.092357	0.044586	0.089172	0.090234	0.090234	0.090234	0.087049	0.093418
B	0.028662	0	0.073248	0.089172	0.091295	0.092357	0.091295	0.023355	0.031847	0.039278	0.037155	0.031847	0.090234
C	0.041401	0.083864	0	0.032909	0.03397	0.03397	0.029724	0.026539	0.029724	0.090234	0.089172	0.029724	0.08811
D	0.03397	0.090234	0.085987	0	0.08811	0.023355	0.037155	0.026539	0.028662	0.026539	0.032909	0.035032	0.081741
E	0.08811	0.071125	0.046709	0.08811	0	0.079618	0.07431	0.059448	0.029724	0.036093	0.06051	0.056263	0.092357
F	0.048832	0.07431	0.087049	0.041401	0.089172	0	0.089172	0.045648	0.023355	0.04034	0.023355	0.028662	0.089172
G	0.059448	0.078556	0.031847	0.028662	0.039278	0.085987	0	0.023355	0.026539	0.065817	0.039278	0.036093	0.08811
H	0.080679	0.077495	0.026539	0.028662	0.035032	0.041401	0.063694	0	0.031847	0.043524	0.035032	0.077495	0.092357
I	0.087049	0.085987	0.081741	0.035032	0.03397	0.048832	0.048832	0.059448	0	0.087049	0.087049	0.047771	0.091295
J	0.087049	0.092357	0.087049	0.04034	0.039278	0.04034	0.089172	0.075372	0.092357	0	0.090234	0.042463	0.090234
K	0.053079	0.091295	0.089172	0.073248	0.08811	0.090234	0.092357	0.085987	0.089172	0.087049	0	0.055202	0.087049
L	0.044586	0.050955	0.038217	0.043524	0.037155	0.042463	0.03397	0.036093	0.03397	0.032909	0.030786	0	0.093418
M	0.090234	0.087049	0.031847	0.080679	0.085987	0.08811	0.089172	0.06051	0.082803	0.089172	0.067941	0.053079	0

Finally, HL, HM, and HU matrices should be converted into the following matrices according to formulas 1 to 3.

$$HL^*(i-HL)^{-1}$$

$$HM^*(i-HM)^{-1}$$

$$HU^*(i-HU)^{-1}$$

Table 6. Matrix HL*(I-HL)⁻¹

HL*(I-HL) ⁻¹	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0.08215	0.183772	0.113458	0.150003	0.154404	0.161836	0.118848	0.132274	0.136118	0.148976	0.143341	0.126638	0.203157
B	0.075074	0.075988	0.10632	0.121136	0.133197	0.134867	0.133748	0.055265	0.060162	0.077385	0.070366	0.056088	0.155414
C	0.073881	0.128655	0.048486	0.064721	0.07355	0.074726	0.073488	0.054887	0.059291	0.119244	0.113462	0.050135	0.139245
D	0.064877	0.132479	0.10652	0.045002	0.117052	0.064993	0.071553	0.048655	0.051824	0.059994	0.058774	0.053455	0.13203
E	0.123577	0.133001	0.085146	0.128306	0.066761	0.124485	0.118004	0.082448	0.064382	0.080866	0.090756	0.07855	0.165615
F	0.07674	0.120797	0.114763	0.073529	0.121763	0.056426	0.124022	0.062744	0.053051	0.073063	0.060694	0.052407	0.145669
G	0.079665	0.118429	0.066837	0.065075	0.077807	0.115549	0.052962	0.050026	0.053161	0.090266	0.064751	0.050238	0.137879
H	0.104869	0.119737	0.059132	0.067269	0.071385	0.079392	0.094705	0.036563	0.057619	0.070473	0.061977	0.091311	0.146823
I	0.131254	0.151967	0.122821	0.084047	0.089379	0.100212	0.101074	0.088195	0.054818	0.132061	0.126888	0.073525	0.169577
J	0.136836	0.171841	0.137077	0.093357	0.102168	0.105211	0.146376	0.108542	0.132883	0.07416	0.137038	0.075752	0.179771
K	0.115233	0.179332	0.146884	0.125386	0.148516	0.154571	0.160983	0.12562	0.129301	0.143282	0.071394	0.090301	0.186221
L	0.063623	0.07852	0.054923	0.06221	0.061855	0.06816	0.061609	0.051047	0.050833	0.05449	0.052755	0.02605	0.131513
M	0.142401	0.16602	0.091707	0.128076	0.142714	0.146235	0.149109	0.098826	0.121059	0.140709	0.11544	0.088576	0.113809

Table 7. Matrix HM*(I-HM)⁻¹

HM*(I-HM) ⁻¹	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0.148502	0.278711	0.188081	0.222402	0.23271	0.241153	0.199079	0.196617	0.199782	0.223965	0.214068	0.188504	0.305869
B	0.126633	0.137464	0.162723	0.175577	0.191956	0.194305	0.194587	0.098295	0.104667	0.131345	0.121304	0.099194	0.231644
C	0.123749	0.193874	0.09127	0.113128	0.124693	0.126724	0.126823	0.095782	0.101321	0.171435	0.162902	0.090121	0.20951
D	0.110591	0.193414	0.155249	0.083499	0.16809	0.111867	0.122072	0.086485	0.089564	0.10483	0.103152	0.090814	0.197028
E	0.184807	0.209259	0.145519	0.187396	0.121521	0.189374	0.184266	0.135167	0.113208	0.138743	0.148612	0.128567	0.248756
F	0.131959	0.189161	0.16842	0.12488	0.178325	0.104834	0.182635	0.108806	0.094258	0.126091	0.107168	0.093323	0.219307
G	0.130793	0.181553	0.112926	0.109006	0.12735	0.16928	0.098405	0.088585	0.092562	0.140102	0.110141	0.090818	0.205924
H	0.157579	0.185319	0.106796	0.112863	0.1237	0.132818	0.151631	0.072275	0.099517	0.122524	0.109144	0.135035	0.217538
I	0.195143	0.232268	0.186345	0.142322	0.152492	0.167363	0.169682	0.1434	0.100248	0.196135	0.187279	0.125854	0.256381
J	0.204895	0.257205	0.204371	0.156275	0.169306	0.174925	0.219646	0.166775	0.190705	0.13319	0.201226	0.130573	0.272189
K	0.187326	0.271537	0.219492	0.19575	0.224358	0.231758	0.239984	0.187889	0.191032	0.216332	0.131056	0.149902	0.286193
L	0.107526	0.135285	0.098443	0.104725	0.106747	0.113517	0.106971	0.086684	0.086483	0.097398	0.09131	0.054271	0.191981
M	0.212121	0.253545	0.157862	0.195057	0.214995	0.219761	0.224254	0.157699	0.179995	0.209826	0.180106	0.144362	0.199358

Table 8. Matrix HU*(I-HU)⁻¹

HU*(I-HU) ⁻¹	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0.232198	0.383166	0.277316	0.302558	0.322805	0.328061	0.294156	0.274721	0.272252	0.31038	0.296274	0.262205	0.412355
B	0.193551	0.214498	0.230511	0.23915	0.258953	0.260824	0.264435	0.157268	0.16243	0.20029	0.187247	0.157933	0.316482
C	0.190484	0.273296	0.14918	0.175767	0.191418	0.193659	0.195644	0.152533	0.156194	0.234534	0.223893	0.14613	0.292914
D	0.171768	0.263436	0.215274	0.134321	0.228119	0.172039	0.186899	0.139242	0.139919	0.1641	0.161695	0.141803	0.272146
E	0.263126	0.302975	0.222572	0.255699	0.193552	0.268427	0.267026	0.206503	0.177599	0.214944	0.223667	0.196761	0.34266
F	0.205604	0.274422	0.233351	0.190392	0.247992	0.169547	0.254942	0.172436	0.150424	0.196064	0.170441	0.151449	0.306085
G	0.201814	0.261579	0.174422	0.167254	0.192425	0.236275	0.16084	0.144227	0.146303	0.20598	0.172156	0.148073	0.286701
H	0.226144	0.266391	0.171129	0.17215	0.192144	0.201684	0.223454	0.124787	0.155322	0.191055	0.172663	0.19199	0.297999
I	0.271825	0.327375	0.263397	0.214615	0.23213	0.249113	0.254159	0.215986	0.159571	0.272923	0.260234	0.195637	0.353098
J	0.286237	0.351385	0.280822	0.231715	0.250486	0.257333	0.304318	0.240752	0.254975	0.2071	0.27574	0.202104	0.372342
K	0.276664	0.375665	0.303067	0.278735	0.314339	0.320277	0.329535	0.264648	0.264359	0.30312	0.208255	0.227423	0.398208
L	0.167916	0.209706	0.157662	0.160451	0.167126	0.173151	0.168466	0.137826	0.135296	0.155861	0.145298	0.097721	0.261675
M	0.296122	0.355024	0.240473	0.275213	0.301221	0.306282	0.312843	0.23309	0.249832	0.290942	0.259197	0.216524	0.299458

A new matrix will be obtained as follows by obtaining these three matrices and combining them (Table 9):

Table 9. Combined matrix

	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0.08215	0.148502	0.232198	0.18372	0.27071	0.383166	0.124953	0.108808	0.199702	0.272252	0.148676	0.13038	0.289157
B	0.075074	0.126632	0.193551	0.079988	0.137484	0.214498	0.10632	0.162728	0.104667	0.16243	0.187247	0.157933	0.136482
C	0.079881	0.123748	0.194044	0.128655	0.193074	0.273296	0.094046	0.09127	0.149108	0.164721	0.113128	0.175767	0.129294
D	0.064077	0.110591	0.171768	0.132479	0.193414	0.263436	0.10632	0.153149	0.216274	0.045002	0.085499	0.134321	0.177246
E	0.126777	0.184807	0.263126	0.133001	0.208299	0.302975	0.1065146	0.145518	0.222572	0.128306	0.187396	0.259699	0.166761
F	0.07674	0.131959	0.205604	0.120797	0.189161	0.274422	0.114763	0.16842	0.233351	0.075529	0.1488	0.193092	0.12763
G	0.079665	0.130793	0.201814	0.118429	0.181553	0.261579	0.166637	0.112936	0.174422	0.065075	0.108106	0.167254	0.107807
H	0.104869	0.153799	0.226144	0.119377	0.165319	0.266391	0.1059122	0.106796	0.171129	0.067269	0.112865	0.17215	0.107385
I	0.131594	0.185449	0.277316	0.152897	0.232368	0.373795	0.112821	0.186345	0.263397	0.084047	0.149332	0.214615	0.089579
J	0.138836	0.204855	0.286237	0.171841	0.257205	0.351285	0.137077	0.204977	0.208022	0.093567	0.156275	0.231715	0.102168
K	0.115238	0.187316	0.276664	0.178932	0.271531	0.375665	0.144688	0.194493	0.303067	0.125386	0.19375	0.278735	0.140536
L	0.066323	0.107516	0.167916	0.07852	0.135285	0.209766	0.054923	0.089445	0.157662	0.08221	0.104725	0.160451	0.160365
M	0.140401	0.212121	0.296122	0.16502	0.255024	0.355024	0.240473	0.128076	0.195057	0.275213	0.142714	0.214955	0.301221

Now, this combined matrix should be diffused again, which is obtained by the following formula (in this formula, the number 13 is the number of research parameters) (Table 10):

$$B=(B_1+B_2+2B_3) / 13$$

Table 10. Diffused matrix

	A	B	C	D	E	F	G	H	I	J	K	L	M	D
A	0.047027	0.086489	0.058995	0.069028	0.07251	0.074785	0.062397	0.061556	0.062149	0.069791	0.06675	0.058912	0.094404	0.884793
B	0.040146	0.043493	0.050944	0.054726	0.059697	0.060331	0.060566	0.031471	0.033225	0.041567	0.038479	0.031724	0.071937	0.618306
C	0.039374	0.060746	0.029247	0.035903	0.039566	0.040141	0.040214	0.030691	0.032164	0.053588	0.051012	0.028962	0.065475	0.547083
D	0.035217	0.060211	0.048638	0.02664	0.052412	0.035444	0.038661	0.027759	0.028529	0.033366	0.032829	0.028991	0.061402	0.510099
E	0.058178	0.06573	0.046058	0.058369	0.03872	0.059358	0.057966	0.043022	0.036031	0.0441	0.04705	0.040957	0.077368	0.672907
F	0.04202	0.059503	0.052689	0.039514	0.055877	0.033511	0.057249	0.03483	0.030153	0.040101	0.034267	0.030039	0.06849	0.578242
G	0.041774	0.057163	0.035932	0.034642	0.040379	0.053106	0.031586	0.028571	0.029584	0.044342	0.035168	0.029227	0.064341	0.525814
H	0.049705	0.058213	0.034143	0.03578	0.039302	0.042055	0.047802	0.023531	0.03169	0.038968	0.034841	0.042567	0.067684	0.546281
I	0.061028	0.072606	0.058378	0.04487	0.048192	0.052619	0.053431	0.04546	0.031914	0.061327	0.058591	0.040067	0.079649	0.708131
J	0.064066	0.079818	0.063588	0.049048	0.053174	0.0548	0.068461	0.052526	0.059174	0.042126	0.06271	0.041462	0.084345	0.775299
K	0.058965	0.084467	0.06838	0.061202	0.070121	0.072182	0.074653	0.058927	0.059671	0.06762	0.041674	0.047502	0.088986	0.854349
L	0.034353	0.042984	0.031498	0.033239	0.034036	0.036027	0.034155	0.027865	0.027623	0.031165	0.029283	0.01787	0.059781	0.439879
M	0.066366	0.079087	0.049839	0.061031	0.067225	0.068618	0.070035	0.049794	0.056222	0.065485	0.056527	0.045679	0.06246	0.798368
R	0.638222	0.850511	0.628327	0.603992	0.671211	0.682976	0.697175	0.516002	0.518128	0.633545	0.589179	0.483958	0.946323	

The threshold value (average of all diffused parameters), equal to 0.50057, can be easily calculated using a diffused matrix. The matrix of how the parameters are related can be obtained by having the value of the threshold value. The matrix of the parameters' relationship is calculated as above. If every matrix element is greater than or equal to the threshold value, the number 1 is assigned, and the number 0 is assigned if it is less than the threshold value. Finally, the matrix of the relationship between the parameters is obtained as follows (Table 11).

Table 11. Matrix of relationships between parameters

	A	B	C	D	E	F	G	H	I	J	K	L	M
A	0	1	1	1	1	1	1	1	1	1	1	1	1
B	0	0	1	1	1	1	1	0	0	0	0	0	1
C	0	1	0	0	0	0	0	0	0	1	1	0	1
D	0	1	0	0	1	0	0	0	0	0	0	0	1
E	1	1	0	1	0	1	1	0	0	0	0	0	1
F	0	1	1	0	1	0	1	0	0	0	0	0	1
G	0	1	0	0	0	1	0	0	0	0	0	0	1
H	0	1	0	0	0	0	0	0	0	0	0	0	1
I	1	1	1	0	0	1	1	0	0	1	1	0	1
J	1	1	1	0	1	1	1	1	0	0	1	0	1
K	1	1	1	1	1	1	1	1	1	1	0	0	1
L	0	0	0	0	0	0	0	0	0	0	0	0	1
M	1	1	0	1	1	1	1	0	1	1	1	0	1

By having a matrix of parameters' relationships, the relationship between them can be identified with a graph.

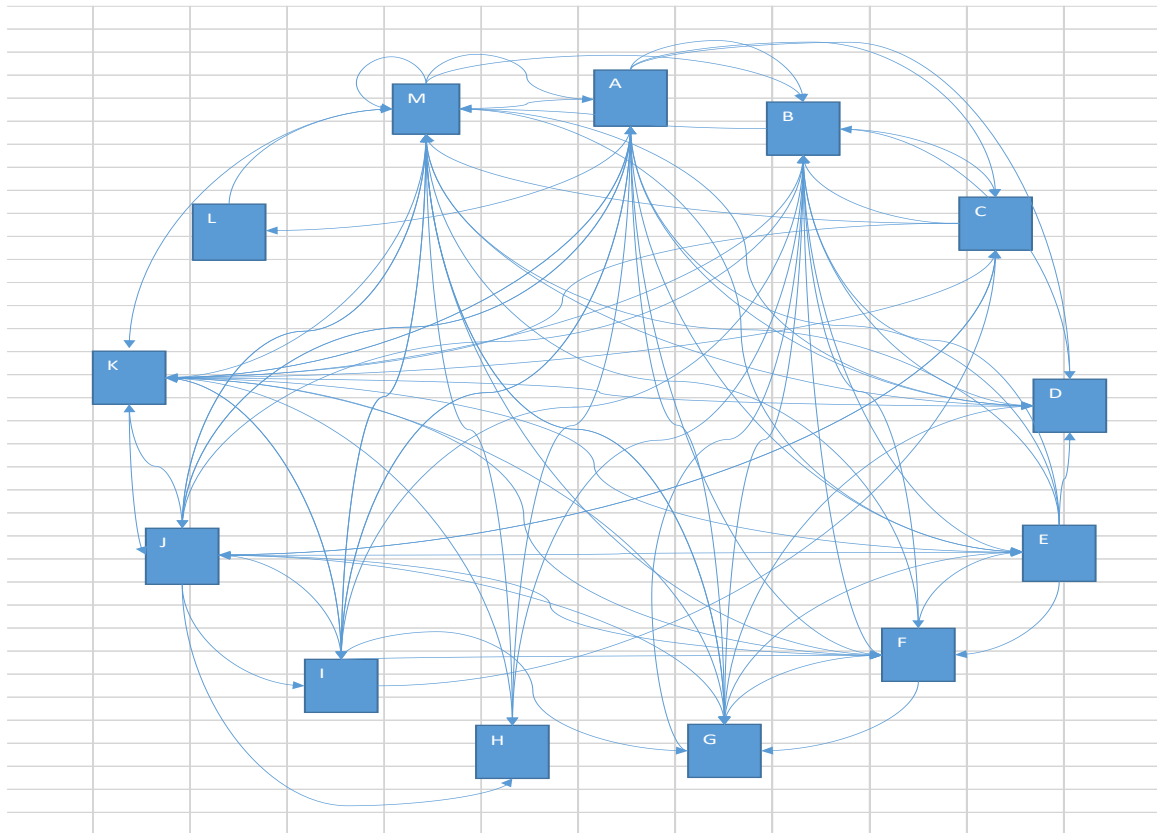


Figure 1. Graph of relationships between parameters

As observed in Table 12, the algebraic sum of each row is named D, and the algebraic sum of each column is named R. A new table can be displayed with these parameters. This table can calculate D-R and D+R and draw the relationship diagram and the criterion's importance.

Table 12. Matrix of relations and importance of criteria

	A	B	C	D	E	F	G	H	I	J	K	L	M
D+R	1.523015	1.468817	1.17541	1.114091	1.344119	1.261219	1.222989	1.062283	1.226259	1.408844	1.443528	0.923837	1.744691
D-R	0.246571	-0.23221	-0.08124	-0.09389	0.001696	-0.10473	-0.17136	0.030279	0.190003	0.141753	0.26517	-0.04408	-0.14796

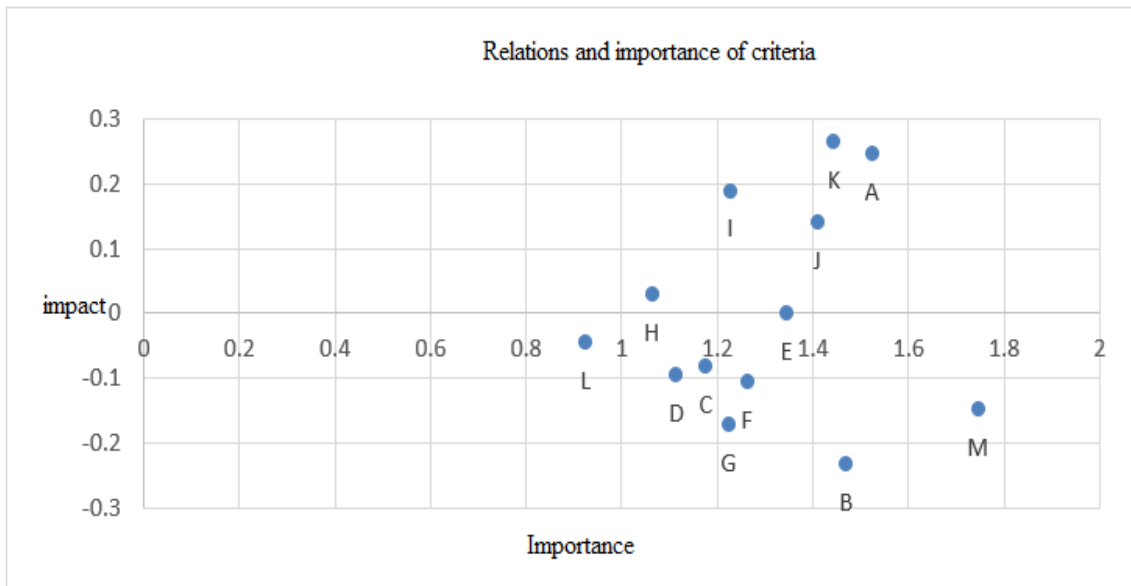


Figure 2. Diagram of relationship and importance of criteria

According to the diagram of the relationship and importance of the criteria, it is determined that investment in food tourism and advertising and using new advertising tools in this field are the most important in creating a food tourism brand in Shiraz. In addition, the parameters of food quality and food authenticity are the most effective in this area, and creating a good feeling towards the brand and advertisements and using new advertising tools in this area are the most influential parameters, respectively.

Table 13. The most effective parameters

The most important parameters	M	A
The most influential parameters	K	A
The most effective parameters	B	G

Table 14. Introduction of parameters

Row	Symbole	Influential factors for creating a food tourism brand
1	A	Advertising and using new advertising tools in this field
2	B	Food quality
3	C	Trained human resources
4	D	Organic food
5	E	The price of food

Row	Symbole	Influential factors for creating a food tourism brand
6	F	Cooking style
7	G	Authenticity of food
8	H	Unique and attractive brand design
9	I	Making people aware of the brand
10	J	Brand trust
11	K	Creating a good feeling toward the brand
12	L	A variety of funeral products
13	M	Investing in food tourism

Discussion

This research identified the 13 most important factors on the material section page. These factors were compiled in a questionnaire to obtain the relation with the branding of food tourism using and relying on the Fuzzy DEMATEL technique. This graph shows the relation between factors, which leads to a better understanding of the decision-making environment. The diagram clearly shows the importance of investment and advertisement in food tourism brands in Shiraz. Food quality and authenticity parameters are the most effective in this area. In addition, creating a good feeling toward the brand and advertising are among the most influential parameters. All these indicators are the most essential key factors in food tourism development in Shiraz. However, the factors at the higher level of the diagram play the most crucial role in the final analysis.

Conclusion

Study shows that the result of factors affecting the creation of tourism food brands is similar to the research of Ghanbari et al. (2022). Factors such as authenticity, culture, and diversity match the Fazli (2021) study. The creation of food tourism brands is the same as the research results. Cheshm Fasa et al. (2020) reached the same conclusion on the factors of cultural capacities, age, and authenticity.

According to the research, the following suggestions are made to create a robust food tourism brand in Shiraz:

- Establishing an exhibition of food science with the help of universities and the food industry
- Applying ISO 22000 and ISO 22002 to the food products and catering systems.
- Establishing food academies and printing articles and books can effectively create a food tourism brand in Shiraz.
- Creating a comprehensive cooking atlas.

- Introducing traditional Cooking and authentic foods.
- Introducing local arts.
- Historical sites in Shiraz can be suitable platforms for food tourism.
- One of the most critical factors in Food tourism branding is registration with UNESCO.

Conflict of Interest

The authors declare no potential conflict of interest regarding the publication of this work.

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