Evaluation of Marketing Resources for Hotels in the World's Second-Largest Religious Metropolis During the COVID-19 Pandemic

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Abstract
Negative impact of COVID-19 pandemic is very evident on the survival and income of many businesses, especially those active in the hospitality industry. Tourism industry has been severely affected by this crisis. Religious tourism has also faced a major crisis due to the closure of many hotels in the world's religious cities. Therefore, in such a situation, it is necessary to pay attention to the factors leading to the creation of competitive advantage and hotels survival. One of the most important of these factors is marketing resources. Marketing resources improve business performance by creating competitive advantage. The aim of this study is to rank marketing resources for the hotels in world's second-largest religious metropolis (Mashhad in Iran) during COVID-19 pandemic. Five attractive marketing resources are selected for this purpose. Fuzzy Analytic Hierarchy Process (FAHP) and Fuzzy Analytic Network Process (FANP) techniques have been used to determine and rank the weight of marketing resources. According to the results obtained, market innovation capabilities stand at the first priority among other resources during COVID-19 pandemic. The finding indicates a great importance of innovation capabilities and the provision of new unique services by the hotels during COVID-19 era. The results of this study can be considered to improve the performance of the hotels in the religious city of Mashhad during COVID-19 pandemic and similar crises.

Keywords: Marketing resources, FAHP technique, Religious tourism, COVID-19 pandemic

1. Introduction

In the last weeks of 2019, coronavirus disease 2019 was diagnosed in China. This disease is often called COVID-19 pandemic. COVID-19 pandemic, as a major crisis, has caused many problems for the governments, businesses, and people (Breier et al., 2021). This crisis has various effects on the prosperity of different businesses. Some businesses benefit from this pandemic and others suffer. For example, the businesses related to the medical supply and services sector have benefited from this disaster. On the other hand, businesses related to the tourism and leisure sector have suffered severely (Hadi & Supardi, 2020). The various effects of the COVID-19 pandemic on different sectors of businesses are shown in Figure 1. In order to improve the business situation, the sectors that are negatively affected by COVID-19 pandemic are given more attention than the other sectors. So that, in this crisis, the hospitality sector has been considered in many studies (Davahli et al., 2020; Kaushal & Srivastava, 2021; Khan et al., 2021; Breier et al., 2021).

The important role of tourism industry in revenue and job creation has led to support the governments for this industry (Kim et al., 2005). With the onset of COVID-19 pandemic, the hospitality industry experienced a serious crisis in most countries around the world. Many of the solutions sought to reduce the impact of COVID-19 pandemic on the members of the community leading to the closure of the most hospitality businesses. Some of these solutions include quarantining the people and ordering them to stay at home, social distance, and travel restrictions (Gursoy & Chi, 2020). The hotels, as a significant part of the hospitality industry, have been severely affected by this crisis (Jiang & Wen, 2020). For

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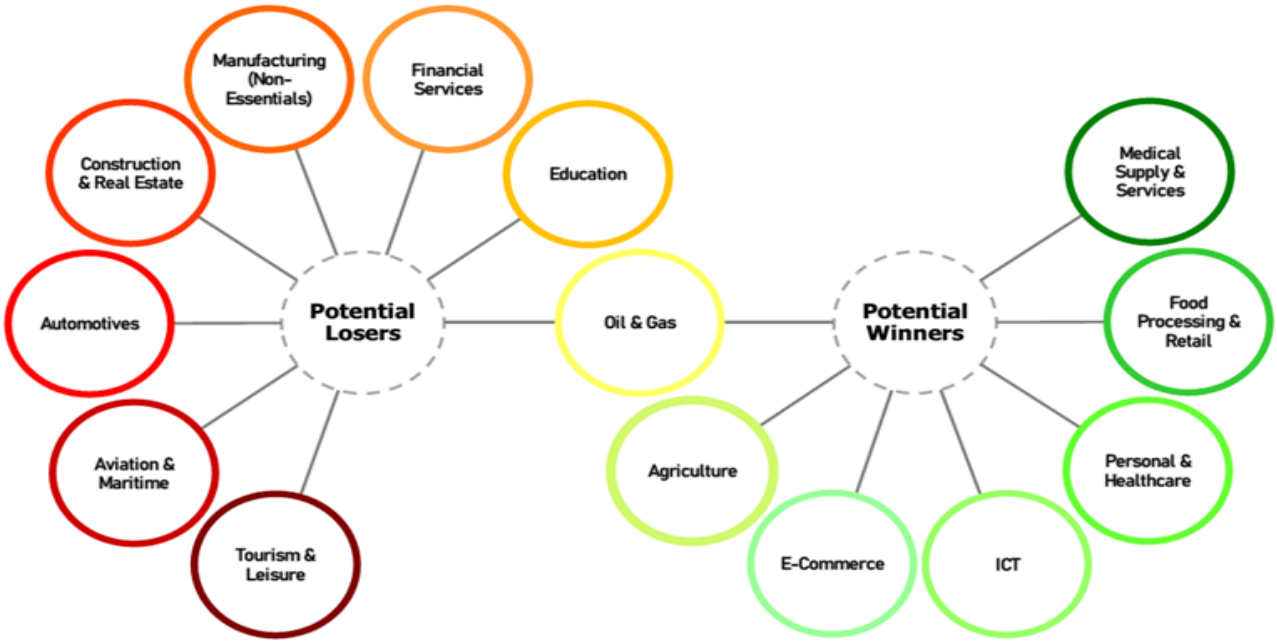

Figure 1. Various effects of the COVID-19 pandemic on different sectors of businesses (Hadi & Supardi, 2020)

example, 80% of hotels capacity in the US was empty in COVID-19 era (Donthu & Gustafsson, 2020). One of the remarkable points of this research is the selection of Mashhad hotels as a case study. Mashhad, as the world's second-largest religious metropolis, second-largest city in Iran and the most important destination of the tourist of the country has special potential in the religious tourism. According to the census and field survey in March 2021, 27% of the hotels in Mashhad had closed their businesses and were inactive. On the other hand, some managers of active hotels in this city said that more than 85% of their hotel capacity is empty. Therefore, it is necessary to evaluate effective factors in the marketing and performance of the hotels in this city during COVID-19 pandemic.

Creating competitive advantage and providing the conditions for business survival during the COVID-19 pandemic requires more attention to marketing resources. In such a situation, prioritizing marketing resources is one of the serious measures in the field of business management. Marketing plays an effective role in determining the strategic orientation and results of business performance (Cacciolatti & Lee, 2016). When a company is more successful in combining the resources and capabilities of its partners, it is more successful in providing new services and products (Mu, 2013). In general, marketing resources help businesses to create a competitive advantage and improve company performance (Davcik & Sharma, 2016). Ultimately, performance improvements can help businesses survival in times of crisis. Another highlight of this study is the ranking of hotel marketing resources for the first time during COVID-19 era.

Prioritizing marketing resources to achieve competitive advantage and business survival can be considered as a Multi Criteria Decision Making (MCDM) issue. Some MCDM methods can be used to determine the weight or importance of the effective factors in an issue. A well-known example of these methods is Analytic Hierarchy Process (AHP) (Russo & Camanho, 2015). For more reliable results, AHP is used in a fuzzy environment. Zadeh (1965) introduced fuzzy logic, and then Bellman & Zadeh (1970) first used fuzzy set theory in decision making. Among the developed Fuzzy Analytic Hierarchy Process (FAHP) methods, in this study, FAHP technique presented by Chang (1996) has been selected to determine the weight of marketing resources and their ranking. In AHP, interdependencies between the criteria are not considered. Hence, a more developed method than AHP was introduced, which is known as Analytic Network Process (ANP), in which the interdependence between the factors is considered. Fuzzy Analytic Network Process (FANP) is also an extended method of ANP implemented in a fuzzy environment. FANP technique, in addition to considering the interdependencies between factors, also considers the issue of uncertainty in prioritizing factors (Tohidi et al., 2020). The main focus of this research is on ranking marketing resources and determining their priority using FAHP and FANP techniques for the hotels in Mashhad during COVID-19 crisis. This research is organized as follows. Firstly, a review of the research literature is provided. In continue, the data analysis process is described in material and methods section. Then, the findings are presented. Eventually, the results of the research are summarized in conclusion section.

2. Review of Literature

Based on the past research, this study ranks hotel marketing resources for the first time during COVID-19 pandemic.

Table1. Marketing resources for creating competitive advantage (Hooley et al., 2005)

Symbol	Marketing resources	Classification
MR1	Managerial capabilities	Marketing support resources
MR2	Customer-linking capabilities	Market-based resources
MR3	Market innovation capabilities	Market-based resources
MR4	Human resource assets	Market-based resources
MR5	Reputational assets	Market-based resources

Some distinguishing points of this research compared to other similar researches are selecting the world's second-largest religious metropolis as a case study, using fuzzy logic in determining the weights of hotel marketing resources and conducting research in COVID-19 pandemic to improve hotel performance in Hooley et al., (2005) defined marketing resources as two general categories of market-based resources and marketing support resources. In their view, the resources create a competitive advantage through instant placement in the market without an intermediary, are called market-based resources. On the other hand, resources indirectly helping to create a competitive advantage by supporting marketing processes are called marketing support resources. They introduced attractive marketing resources that included both market-based resources and marketing support resources. These marketing resources are given in Table 1 through abbreviated titles. MR1 refers to business service management, financial management, operations management technology, and human resource management. MR2 includes understanding customer needs, connecting with key customers, customer service levels maintaining and improving existing customer relationships, and building new customer relationships.MR3 is defined as an innovation in services and products not easily imitated, but measured by the ability of the business to provide new services and products. MR4 refers to the achievement of organizational goals, retention and ability and talent of employees, and job satisfaction of employees of the organization. MR5 defines the company's brand and its value in the customer's mind. It is measured by the possibility of developing a company's reputation for creating added value and helping to create a competitive advantage for the business. In many past studies, these resources have been evaluated and used in prioritizing marketing strategies (Mohaghar et al., 2012; Ebrahimi et al., 2015; Tohidi et al., 2020).

Depending on the research literature, related research sources and expert comments, there are different perspectives on the interdependence between marketing resources. Some studies have considered them as independent and have used only AHP method and others have considered internal relationships between them which have used ANP technique to prioritize and calculate their weight. The interdependencies between them are defined as follows (Vafaie & Nasiri, 2020):

(1) MR1 is affected by MR3 and MR4.

(2) MR3 is affected by MR1, MR2 and MR4.

(3) MR2, MR4, and MR5 are affected by all marketing resources.

These marketing resources have been considered in some studies as hotel marketing resources. Lin & Wu (2008) evaluated these marketing resources for private hotels in Taiwan using AHP method and used them to select a hotel marketing strategy. The results of their study showed that the weight of customer-linking capabilities is more than the weight of other resources. In another study, the weight of these resources for private hotels in Taiwan was determined by using Analytic Network Process (ANP) method. Based on the results, customer-linking capabilities have the most weight (Wu et al., 2010).

A study aimed to select the best marketing strategy by considering marketing resources as the main criteria for hotels active in winter tourism was conducted by Yilmaz et al., (2015). They used AHP technique to determine resource weights. Their research findings showed that customer-linking capabilities are the most effective marketing resource for creating a competitive advantage in winter tourist hotels.

Vafaie & Nasiri (2020) used these five marketing resources as criteria for an MCDM issue to prioritize the marketing strategies of premium hotels in the centers of Kurdistan and Kermanshah provinces in Iran. According to this research, managerial capabilities had the most weight. They used the weight of marketing resources as input to the technique for order of preference by similarity to ideal solution (TOPSIS) to prioritize marketing strategies.

In the present study, five marketing resources presented in Table 1 have been evaluated. Over the past year, during COVID-19 pandemic, some researchers have focused on hospitality marketing. Jiang & Wen (2020) conducted a study aimed to the effect of the COVID-19 pandemic on management practices and hotel marketing. They presented a three-dimensional research agenda. This research agenda includes three dimensions of artificial intelligence and robotics, cleanliness and hygiene, and health care. They provided advices to researchers in all three dimensions. Another study with a qualitative approach was conducted by Larsson & Gustavsson (2020) aiming to examine the change in the marketing direction of small and medium-sized companies in the hospitality industry of Norrbotten, Sweden. The results of their research showed that the companies under the study have been affected by the economic crisis caused by COVID-19 pandemic. On the one hand, the lack of attention of previous studies to the issue of marketing resources during COVID-19 era, and also, the importance of evaluating marketing resources to improve the performance of hotels during this period, led to the issue being considered in the

present study. In many researches, FAHP and FANP methods have been used to evaluate important criteria and factors in various objects. Mohaghar et al., (2012) determined the fuzzy weights of marketing resources using FAHP method for Yazd Baft Company in Iran. They used the obtained weights as input to other MCDM methods to select the appropriate marketing strategy. Their findings indicated that managerial capabilities are the most important factor in determining the marketing strategy for the company. A study was conducted by Do & Chen (2013) aimed to evaluate the factors affecting tourism performance using FAHP technique. The results of their research showed that among the main factors studied, promotional activities had the highest weight. On the other hand, among the sub-factors, tourism policy had the best rank. Nilashi et al., (2016) used FANP to prioritize hospital information system (HIS) adoption factors. The results represented that compatibility is the most important factor in HIS adoption by the hospitals. In another study, Internet of Things (IoT) factors in Iran were ranked by FANP technique (Mohammadzadeh et al., 2018). Based on the ranking, the important IoT factor of Internet of Things was the technological factor. Baki (2020) has conducted a study by the aim of ranking hotel websites. To achieve the goal, the weight of factors affecting the ranking of hotel websites was determined using FAHP method. Finally, the obtained weights were used as input to TOPSIS technique for ranking hotel websites. In a study, Nguyen (2021) ranked service quality criteria using FAHP method for some five-star hotels in Vietnam. The findings of this study showed that tangibles and assurance criteria are the most important service quality criteria for the hotels. Taghavi et al., (2021) have used FANP method to prioritize important factors in the implementation of green supply chain management. Recently, a study was conducted to rank the effective criteria for selecting sharia stock in Indonesian stock exchange using FANP method (Ghoni & Mutiara, 2022). The results showed that the profitability is the most important criterion in this regard.

3. Material and Methods

In this research, an attempt has been made to rank the marketing resources for the hotels in COVID-19 era using FAHP and FANP methods. For this purpose, a standard pairwise comparison questionnaire was designed. At the time of this survey (March 2021), only 115 of 158 identified hotels in Mashhad were active, and other hotels were closed under the effect of COVID-19 pandemic crisis. Therefore, the questionnaires were distributed among 115 senior managers of hotels in Mashhad, Iran. The questionnaire was completed by 92 experts. The questionnaire was designed based on linguistic terms and then the fuzzy pairwise comparison matrix related to each expert was determined based on triangular fuzzy numbers (TFN). The linguistic terms and related triangular fuzzy numbers used in this study are presented in Table 2.

After forming the fuzzy pairwise comparisons matrix of all experts, the consistency of each matrix was examined. For inconsistent matrices, relevant experts were asked to re-evaluate their pairwise comparisons. After making sure that all matrices were consistent, the integrated fuzzy pairwise comparisons matrix was created through the geometric mean of the elements within the matrices. The Chang's FAHP method has been used to determine the weights of marketing resources and their prioritization. Figure 2 represents the research framework providing an overview of the study process. Microsoft Excel 2019 software has been used to analyze the results and perform all steps of FAHP technique. In the following, in three separate subsections, the method used to evaluate the consistency of fuzzy pairwise comparison matrices, Chang's FAHP technique, and FANP method are described.

3.1.Consistency ratio

After collecting the comments of experts and forming fuzzy pairwise comparisons matrix related to each expert, Consistency Ratio (CR) of each matrix should be obtained. CR indicates the extent to which the collected data can be trusted from the perspective of each expert. Any errors and inconsistencies in the comparison of elements within the pairwise comparison matrix will affect the final result obtained from the calculations. Gogus & Boucher (1998) proposed a method for calculating CR of the fuzzy pairwise comparison matrices. Suppose $\tilde{P}$ is a $n \times n$ fuzzy pairwise comparison matrix. To determineCR, we must first divide the fuzzy pairwise comparison matrix into two separate matrices, P^m andP^g. Matrix P^m is created by the mean values of the preferences of the experts and is expressed as equation (1). Matrix P^g is created by the geometric mean of the upper and lower bounds of TFNs and defined as equation (2). These two matrices will contain crisp data. Then, using the method presented by Saaty (2003), the consistency index (CI) of two matrices P^m and P^g is calculated. To do this, firstly, the weight vectors of both matrices must be calculated using Saaty's method. The weight vectors are denoted by w^m and w^g, which are determined by Equations (3) and (4), respectively. Then the largest eigenvalues (λ_{max}) for both matrices are calculated through equations (5) and (6), respectively. Equations (7) and (8) were used to calculate the values of CI for both matrices P^m and P^g, respectively.

$$P^m = [p_{ijm}] \quad (1)$$

$$P^g = \left[\sqrt{p_{iju} \times p_{ijl}}\right] \quad (2)$$

Where p_{ijl}, p_{ijm}, and p_{iju} are the lower, middle, and upper bounds of TFNs, respectively.

$$w^m = [w_i^m] = \left[\frac{1}{\mathrm{n}}\sum_{j=1}^{n}\frac{p_{ijm}}{\sum_{i=1}^{n} p_{ijm}}\right] \quad (3)$$

$$w^g = \left[w_i^g\right] = \left[\frac{1}{\mathrm{n}}\sum_{j=1}^{n}\frac{\sqrt{p_{iju}\times p_{ijl}}}{\sum_{i=1}^{n}\sqrt{p_{iju}\times p_{ijl}}}\right] \quad (4)$$

$$\lambda_{max}^m = \frac{1}{\mathrm{n}}\sum_{i=1}^{n}\sum_{j=1}^{n} p_{ijm}\left(w_j^m / w_i^m\right) \quad (5)$$

$$\lambda_{max}^g = \frac{1}{\mathrm{n}}\sum_{i=1}^{n}\sum_{j=1}^{n}\sqrt{p_{iju} \times p_{ijl}}\left(w_j^g / w_i^g\right) \quad (6)$$

Table 2. Linguistic terms and TFNs (Özkan et al., 2020)

Scale	Linguistic Term	Triangular Fuzzy Number
$\tilde{1}$	Equally important	(1,1,1)
$\tilde{2}$	Equally to moderately important	(1,2,3)
$\tilde{3}$	Moderately important	(2,3,4)
$\tilde{4}$	Moderately to strongly important	(3,4,5)
$\tilde{5}$	Strongly important	(4,5,6)
$\tilde{6}$	Strongly to very strongly important	(5,6,7)
$\tilde{7}$	Very strongly important	(6,7,8)
$\tilde{8}$	Very strongly to extremely important	(7,8,9)
$\tilde{9}$	Extremely important	(8,9,10)

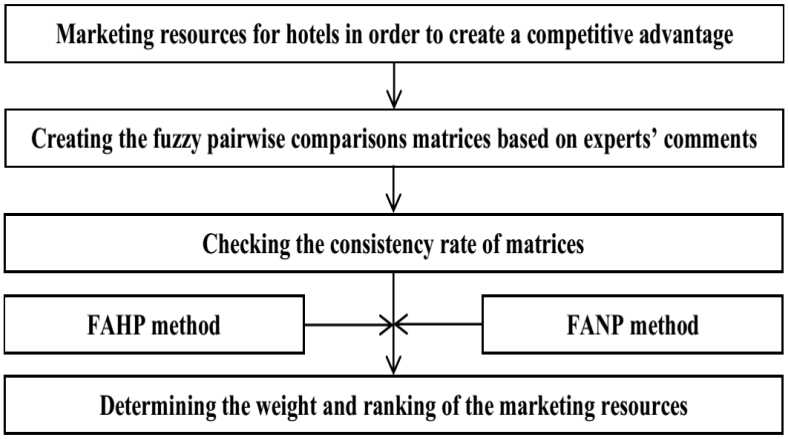

Figure 2. Research framework

$$CI^m = \frac{\lambda^m_{max} - n}{n-1} \quad (7)$$

$$CI^g = \frac{\lambda^g_{max} - n}{n-1} \quad (8)$$

Finally, to calculateCR, CI must be divided by a random index (RI). According to the size of the pairwise comparisons matrix, Gogus & Boucher (1998) presented the values of random indices. The size of the pairwise comparison matrix in this study is 5×5, so the values of RI^m and RI^g are 1.0720 and 0.3597, respectively. It is clear that, at the end, we will have two CR addressed by CR^m andCR^g. If both CR^m and CR^g are less than 0.1, the fuzzy pairwise comparison matrix is recognized and is reliable. If the value of both or one of them is greater than 0.1, the experts are asked to re-evaluate their comparisons (Gogus & Boucher, 1998). The values of these two parameters are calculated as follows.

$$CR^m = \frac{CI^m}{RI^m} \quad (9)$$

$$CR^g = \frac{CI^g}{RI^g} \quad (10)$$

3.2.Chang's FAHP method

Saaty (1980), firstly, introduced AHP method. This technique is one of the practical methods in the field of decision-making. It is based on pairwise comparisons and can be used to evaluate different criteria and options. By developing AHP technique, several methods have been proposed in which fuzzy numbers are used to express the degree of element preference. Among these, we can mention the methods presented by Van Laarhoven & Pedrycz (1983), Buckley (1985), Chang (1992, 1996), and etc. FAHP Method proposed by Chang (1996) was used to determine the weights of factors or marketing resources studied in this research. Chang's approach is more common and relatively easier than other FAHP techniques. The following orders are proposed to calculate the weight of the criteria based on Chang's FAHP method (Vinogradova-Zinkevič et al., 2021).

Order 1: Draw a hierarchical tree. The first step of FAHP method is to draw the hierarchical structure or hierarchical tree of the research problem.

Order 2: Create the fuzzy pairwise comparisons matrix ($\tilde{P}$). Given that $\tilde{p}_{ij}$ is a set of experts' preferences for one criterion over another, $\tilde{P}$ is defined as follows.

$$\tilde{P} = \left[\tilde{p}_{ij}\right]_{n\times n} = \begin{bmatrix} 1 & \tilde{p}_{12} & \tilde{p}_{1n} \\ \tilde{p}_{21} & 1 & \tilde{p}_{2n} \\ \tilde{p}_{n1} & \tilde{p}_{n2} & 1 \end{bmatrix} \; i = 1.2.\ldots.n; \; j = 1.2.\ldots.n \quad (11)$$

where *n* is the number of related elements in each row.

Order 3: Obtain the fuzzy compound expansion ($\tilde{S}_i$). In this step, $\tilde{S}_i$ must be obtained for each row of $\tilde{P}$. $\tilde{S}_i$ is calculated by equation (12).

$$\tilde{S}_i = \sum_{j=1}^{m} \tilde{M}_{gi}^{j} \otimes \left[\sum_{i=1}^{n}\sum_{j=1}^{m} \tilde{M}_{gi}^{j}\right]^{-1} \quad (12)$$

Table3. Demographic information of the respondents

Demographic characteristics	Option	Frequency	Relative frequency percentage
Gender	Male	63	68.48
	Female	29	31.52
Age	20 to 30 years	18	19.56
	31 to 40 years	53	57.61
	41 to 50 years	17	18.48
	51 to 60 years	4	4.35
	More than 60 years	0	0
Education	Bachelor	17	18.48
	Master	63	68.48
	Ph.D.	12	13.04
Experience	3 to 5 years	2	2.17
	6 to 8 years	23	25.00
	8 to 10 years	26	28.26
	More than 10 years	41	44.57

Table 4. Integrated fuzzy pairwise comparison matrix

	MR1	MR2	MR3	MR4	MR5
MR1	(1,1,1)	(0.720,0.903,1.134)	(0.418,0.518,0.663)	(0.608,0.770,1.012)	(0.521,0.674,0.894)
MR2	(0.882,1.108,1.388)	(1,1,1)	(0.442,0.591,0.816)	(0.706,0.900,1.209)	(0.612,0.806,1.089)
MR3	(1.508,1.932,2.394)	(1.225,1.692,2.263)	(1,1,1)	(1.063,1.448,1.914)	(0.909,1.343,1.914)
MR4	(0.988,1.298,1.645)	(0.827,1.111,1.416)	(0.522,0.691,0.941)	(1,1,1)	(0.661,0.818,1.052)
MR5	(1.119,1.484,1.919)	(0.919,1.241,1.634)	(0.522,0.745,1.100)	(0.951,1.223,1.514)	(1,1,1)

Table 5. Fuzzy sum of each row and the fuzzy compound expansion

Marketing resource	Fuzzy sum of each row			Fuzzy compound expansion		
	U	M	L	U	M	L
MR1	3.267	3.864	4.703	0.099	0.147	0.223
MR2	3.642	4.405	5.502	0.111	0.168	0.260
MR3	5.705	7.415	9.486	0.173	0.282	0.449
MR4	3.998	4.918	6.054	0.121	0.187	0.287
MR5	4.510	5.693	7.166	0.137	0.217	0.339

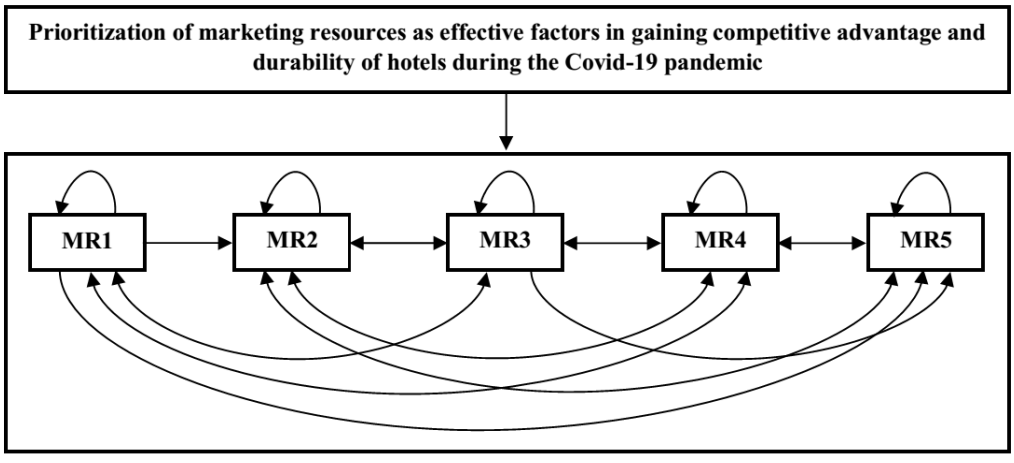

Figure 4. The hierarchical structure and interdependencies between the criteria (Vafaie & Nasiri, 2020)

Where, the different components of equation (12) can be calculated through equations (13), (14) and (15) respectively.

$$\sum_{j=1}^{m} \widetilde{M}_{gi}^{j} = \left(\sum_{j=1}^{m} l_j \ , \sum_{j=1}^{m} m_j \ , \sum_{j=1}^{m} u_j\right) = (l_i^{'} , m_i^{'} , u_i^{'}) \quad (13)$$

$$\sum_{i=1}^{n} \sum_{j=1}^{m} \widetilde{M}_{gi}^{j} = \left(\sum_{j=1}^{m} l_i^{'} \ , \sum_{j=1}^{m} m_i^{'} \ , \sum_{j=1}^{m} u_i^{'}\right) \quad (14)$$

$$\left[\sum_{i=1}^{n} \sum_{j=1}^{m} \widetilde{M}_{gi}^{j}\right]^{-1} = \left(\frac{1}{\sum_{j=1}^{m} u_i^{'}} \cdot \frac{1}{\sum_{j=1}^{m} m_i^{'}} , \frac{1}{\sum_{j=1}^{m} l_i^{'}}\right) \quad (15)$$

Where l_i . m_i , and u_i are the first to third components of TFNs, respectively.

Order 4: Calculate the degree of preference of $\tilde{S}_i$ over $\tilde{S}_k$. If $\tilde{S}_i = (l_i \,.\, m_i \,.\, u_i)$ and $\tilde{S}_k = (l_k \,.\, m_k \,.\, u_k)$, then the degree of preference of $\tilde{S}_i$ over $\tilde{S}_k$, denoted by $V(\tilde{S}_i > \tilde{S}_k)$, is defined as follows.

$$V(\tilde{S}_i > \tilde{S}_k) = \alpha_{si}(d) \begin{cases} 1 & if\ m_i \geq m_k \\ 0 & if\ l_k \geq u_i \\ \frac{l_k - u_i}{(m_i - u_i) - (m_k - l_k)} & otherwise \end{cases} \quad (16)$$

Where d corresponds to the largest point of intersection between α_{sk} and α_{si}. Figure 3 shows the value $V(\tilde{S}_i > \tilde{S}_k)$.

Order 5: Calculate the weights of the criteria. In this step, the weights (w') of all the criteria in the fuzzy pairwise comparison matrix are determined. Equation (17) is used to calculate the weights of the criteria and the weight vector of the criteria can be defined as equation (18). On the other hand, in this study, the weight of marketing resources has been evaluated as the main criteria of the research.

$$w'(p_i) = min\{V(\tilde{S}_i > \tilde{S}_k)\} \quad k = 1.2. \ldots . n \ . \ k \neq i \quad (17)$$

$$W' = [w'(p_1). w'(p_2). \ldots . w'(p_n)]^T \ k = 1.2. \ldots . n \ . \ k \neq i \quad (18)$$

Table 6. Degree of preference of $\tilde{S}_i$ over $\tilde{S}_k$

Marketing resource	Preference of $\tilde{S}_i$ over $\tilde{S}_k$			
MR1	0.845	0.267	0.716	0.552
MR2	1.000	0.432	0.877	0.716
MR3	1.000	1.000	1.000	1.000
MR4	1.000	1.000	0.544	0.835
MR5	1.000	1.000	0.717	1.000

Table 7. Weights, normalized weights, and rank of the marketing resources in FAHP technique

Marketing resource	Weight	Normalized weight	Rank
MR1	0.267	0.090	5
MR2	0.432	0.146	4
MR3	1.000	0.338	1
MR4	0.544	0.184	3
MR5	0.717	0.242	2

Table 8. FANP unweighted and weighted super matrices

Marketing resource	MR1	MR2	MR3	MR4	MR5
MR1	0.057	0.090	0.078	0.090	0.090
MR2	0.000	0.146	0.159	0.146	0.146
MR3	0.637	0.338	0.512	0.338	0.338
MR4	0.306	0.184	0.251	0.184	0.184
MR5	0.000	0.242	0.000	0.242	0.242

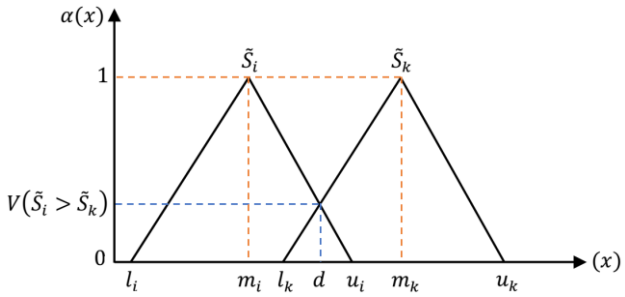

Figure 3. Degree of preference of $\tilde{S}_i$ over $\tilde{S}_k$

Order 6: Calculate the normalized weights of the criteria and prioritize them. To calculate the normalized weights of the criteria, the weight of each criterion must be divided by the sum of the criteria weights, which is determined by Equation (19). Also, the normalized weight vector can be defined as equation (20).

$$w^n(p_i) = \frac{w'(p_i)}{\sum_{j=1}^{n} w'(p_j)} \quad i = 1.2. \ldots . n \ . \ j = 1.2. \ldots . n \quad (19)$$

$$W = [w(p_1). w(p_2). \ldots . w(p_n)]^T \quad (20)$$

3.3.FANP method

FANP can be considered as a more developed technique than AHP in which interdependence between factors is also considered and was firstly proposed by Saa (Taghavi et al., 2021). FANP method is a more advanced ANP mode in which triangular fuzzy numbers are used in pairwise comparisons of criteria. To implement FANP method, based on the interdependence of factors and also the influence of each of them on the others, several fuzzy pairwise comparison matrices are formed. In the following, the initial weight of the criteria is calculated using Chang's FAHP technique.

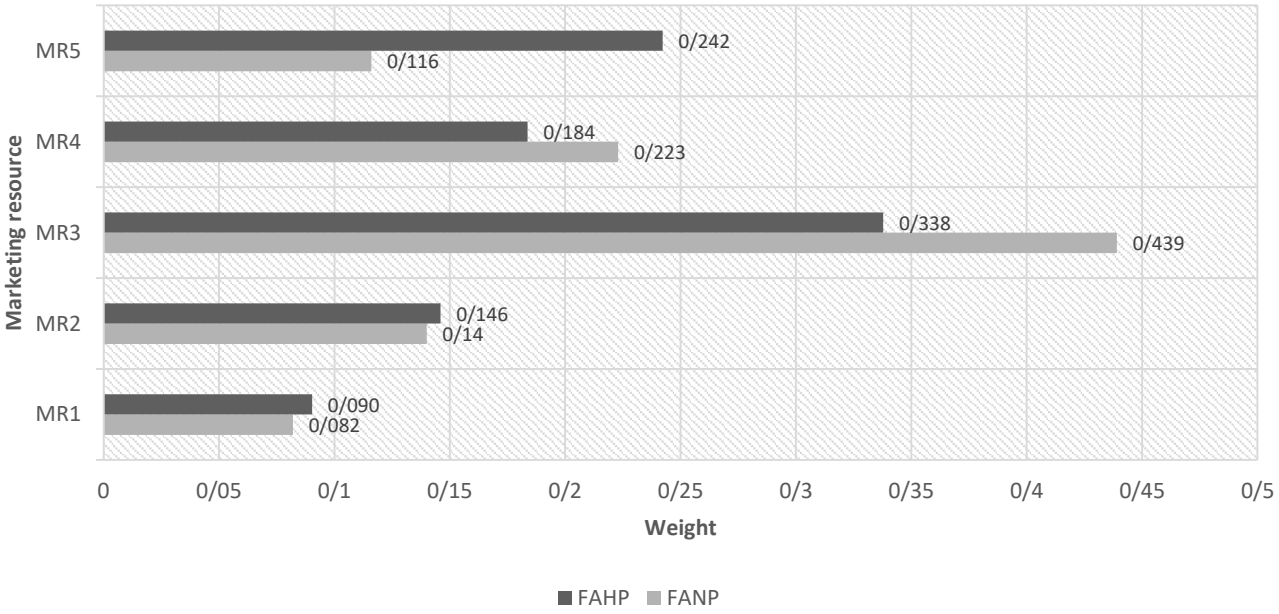

Figure 4. Comparison of normalized weights of marketing resources in FAHP and FANP techniques

Table 9. FANP limit super matrix

Marketing resource	MR1	MR2	MR3	MR4	MR5	Rank
MR1	0.082	0.082	0.082	0.082	0.082	5
MR2	0.140	0.140	0.140	0.140	0.140	3
MR3	0.439	0.439	0.439	0.439	0.439	1
MR4	0.224	0.224	0.224	0.224	0.224	2
MR5	0.116	0.116	0.116	0.116	0.116	4

Then, FANP unweighted super matrix is formed using the obtained initial weights. By normalizing the unweighted super matrix, the weighted super matrix is created. Finally, by empowering the weighted super matrix, the limit super matrix and the final weight of the factors are calculated. In this study, to perform FANP technique, the initial weight of the factors was calculated using the implementation of FAHP method in Microsoft Excel 2019 software. The output weights were considered as input of Super Decision 3.2 software to implement FANP method.

4. Results

The people answered the questions of the research questionnaire were examined in terms of four demographic characteristics and the relative frequency percentage of respondents in terms of gender, age, level of education, and work experience is presented in Table 3.A total of 92 fuzzy pairwise comparison matrices were formed based on linguistic terms and TFNs

4.1.Checking the consistency ratio

According to the method described in previous section, CR values of the matrices were checked and the inconsistent matrices were returned to the experts for the re-evaluation. Finall the consistency of all matrices was ensured. Using the geometric mean of the elements within the matrices, the integrated fuzzy pairwise comparison matrix was formed, which is presented in Table 4. The consistency of this matrix was also clearly confirmed. So that the values of CR^m and CR^g for this matrix were 0.0004 and 0.001, respectively. Both values are less than 0.1, indicating that the matrix is consistent.

4.2.Ranking of marketing resource by Chang's FAHP technique

The integrated fuzzy pairwise comparison matrix was considered as input for Chang's FAHP method. Based on the equations expressed in *material and methods* section, the fuzzy sum of each row and the fuzzy compound expansion were calculated and determined, which are presented in Table 5.

In the following, the degree of preference or feasibility of $\tilde{S}_i$ over $\tilde{S}_k$ was calculated and presented in Table 6. Finally, the degree of preference or weight of each marketing resource (main factors) and their normalized weights were calculated. Table 7 shows the values of weights, normalized weights, and rank of marketing resources. According to the calculations, MR3 was ranked as the first and most important among the marketing resources for the hotels during COVID-19 pandemic. The next ranks are assigned to MR5, MR4, MR2, and MR1, respectively.

Table 10. Compare the ranking of hotel marketing resources in the present study and past studies

	Era	Location of hotels	Used method	Rank of the marketing resources				
				MR1	MR2	MR3	MR4	MR5
Present study	Pandemic	Mashhad, Iran	FAHP	5	4	1	3	2
Present study	Pandemic	Mashhad, Iran	FANP	5	3	1	2	4
Vafaie & Nasiri, 2020	Normal	Kermanshah and Sanandaj, Iran	ANP	1	2	4	3	5
Sorayaei & Mehraee, 2013	Normal	Mazandaran Province, Iran	FAHP	1	2	3	4	5
Hajipour et al., 2012	Normal	Khuzestan, Tehran and Isfahan provinces, Iran	ANP	3	2	5	1	4
Wu et al., 2010	Normal	Taiwan	ANP	1	4	2	3	5
Lin & Wu, 2008	Normal	Taiwan	AHP	4	1	2	5	3

4.3. Ranking of marketing resource by Chang's FAHP technique

The integrated fuzzy pairwise comparison matrix was considered as input for Chang's FAHP method. Based on the equations expressed in *material and methods* section, the fuzzy sum of each row and the fuzzy compound expansion were calculated and determined, which are presented in Table 5.

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4.4. Ranking of marketing resource by FANP technique

Considering the interdependence between the criteria, FANP method was implemented. Unweighted super matrix was formed, and since the sum of the values of each column of this matrix was equal to 1, the weighted matrix was equal to the same matrix. The values for both super matrices are given in Table 8. Table 9 shows the limit super matrix. Based on the limit super matrix, the normal weight of the factors was obtained and the marketing resources were prioritized as shown in Table 9. MR3 was ranked at first place and MR1 the last one. The difference in weights related to the marketing resources of the studied hotels can be seen in Figure 5. In prioritizing marketing resources by both FAHP and FANP methods, MR3 has the highest percentage of importance, and this highlights the need to pay attention to the provision of new services that are not easily imitated by competitors. It should be noted that this ranking was done aiming to determine the importance or priority of each marketing resource in a crisis (not choosing a specific marketing resource). Therefore, the greater weight of MR3 does not mean that the importance of other resources is ignored. The main difference between the results of two techniques is that, in prioritizing marketing resources with FAHP method, MR5 ranked second, while in FANP method, MR4 came in second place.

4.5. Compare the present and previous results

Table 10 shows a comparison between the ranking of effective marketing resources in creating a competitive advantage for hotels in the present study with some previous research. Comparisons show that by changing the study location, the statistical population of the study, and the used method, different results will be obtained. Of course, this difference is very evident in the present study, which was conducted during the COVID-19 pandemic. In such a way that the MR3 has not been ranked first in any of the previous studies conducted in non-pandemic (normal) conditions. But in this study, this factor is in the first place of importance in the period of the COVID-19 pandemic. In most previous studies that have been done under normal conditions, MR1 have gained a special rank, while in the present study in Covid-19 era and in both FAHP and FANP methods, it has gained the last rank.

5. Conclusion

During COVID-19 pandemic, paying more attention to marketing resources is required for the hotels to survive and gain a competitive advantage. One of the most important and necessary measures of hotel management in this critical situation is to prioritize marketing resources. In this study, the importance of five attractive marketing resources has been determined for the hotels in the religious city of Mashhad during COVID-19 era. Using FAHP and FANP techniques, marketing resources were evaluated and their weight was determined. The final result showed that among marketing resources, market innovation capabilities are the most important for the survival of the hotels and their achievement to competitive advantage during COVID-19 pandemic. pandemic. In such a way that MR3 has not been ranked at first in any of the previous studies conducted in non-pandemic (normal) conditions. But in this study, this factor is at the first place of importance in the period of COVID-19 pandemic. In most previous studies that have been done under normal conditions, MR1 have gained a special rank, while in the present study in Covid-19 era and in both FAHP and FANP methods, it has gained at last.

On the other hand, managerial capabilities have the least weight among resources. Therefore, in COVID-19 era or similar crises, improving market innovation capabilities should be a priority to manage the hotels studied. By focusing on the market innovation capabilities in critical situations, hotels can increase demand for the services provided. Hotels should be innovative to use better the

information and communication technologies such as applications and software to provide more suitable and simpler customer service Innovation capabilities in the hotel industry can create a significant gap between competitors and is effective in attracting more customers in a pandemic crisis. In addition, in this crisis, the hotels having good reputational assets can get better condition than the others. This research was conducted during COVID-19 pandemic and crisis conditions, and the results can be considered by hotel managers and researchers in such crises. Therefore, it is suggested that a study with the same framework be conducted in the post-COVID-19 era to improve the performance of hotels and other businesses. Considering marketing resources as appropriate criteria for prioritizing marketing strategies, the weights obtained from this research can be used as input to the other methods to rank marketing strategies for the hotels in the world's second-largest religious metropolis during COVID-19 pandemic. It is recommended that effective factors in creating a competitive advantage and the hotels survival in other important religious tourism destinations be studied during COVID-19 and post-COVID-19 eras.

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