A Fuzzy Analytic Hierarchy Process (FAHP) Based on SERVQUAL for Hotel Service Quality Management: Evidence from Vietnam*

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Abstract

Nowadays, quality affects product or service performance and customer loyalty in the competitive business' environment. This is truly important when it comes to how the customer interprets the service's satisfaction and the judgment of the purchase process as a whole, in view of the fact that service quality is an abstract and elusive construction due to the three characteristics of services: intangibility, heterogeneity, and inseparability of output and consumption. The main purpose of this paper is to determine the hotel service quality using the Fuzzy Analytic Hierarchy Process (FAHP) and SERVQUAL method. In this study, a five-star hotel's real case is considered in evaluating the service quality criteria. The results revealed that Tangibles and Assurance are the most critical service quality criteria in the hotel industry. Accurate records, service consistency, Necessary arrangements for disabled people, Service flexibility to guests' demands, and Providing the services at the time it promises are the most influencing sub-criteria of service quality. These findings indicate that hotels should concentrate on sequentially and organized priority factors to enhance service quality. This method of service quality assessment may also aid in distinguishing between hotels. Finally, as a future direction, more additional parameters can be used as a potential guide in our proposed model for the dynamic decision-making approach.

Keywords: Service Quality, Hotel Industry, SERVQUAL, MCDM, Fuzzy AHP

JEL Classification Code: G21, G23, G32, H21

1. Introduction

Tourism is now recognized as an essential and integral part of the country's development strategy by many world countries, according to the International Trade Organization (WTO) (2017). Tourism plays a leading role in helping the government's budget, Gross Domestic Product (GDP), and creates massive employment opportunities. Tourism also has a considerable influence on the world's economy, such as travel, connectivity, construction, industry, production of mass consumer items, various service sectors, and many others. Tourism is one of the leading sectors in terms of jobs. Tourism leads to economic gains and the nation's growth by extending its brand, value, and identification. Thus, increased tourism investments have been key drivers for socio-economic growth by creating jobs and export earnings, and infrastructure development.

However, a study by (Khan et al. 2020) showed that the tourism industry maintains a close connection with the global economy's economic growth. There are so many factors that have a positive and a negative effect on the tourism industry on the world's global economy in the short and long run. Among these factors, the well-known factors which have both positive and negative impact on the tourism industry are culture, stability, protection, developed world infrastructure, visa facilities, natural beautification, the attitude of people, tourist number, quarantine, world population, education, income level, the price level of different products in the world, other languages and hotel prices. UNWTO (2017) suggested that Asia and the Pacific are the fastest-growing regions with 308 million foreign tourists. Southeast Asia recorded an increase in international tourist arrivals of 9 percent,

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with Vietnam 26 percent. Tourism is one of Vietnam's most important drivers for economic growth and contributes over 6% to Vietnam's GDP, and in 2011 the Vietnam Tourism Growth Plan, Vision 2030 was published by the Vietnam government to direct towns and provinces in boosting their tourism industries. In addition to leisure travel, Vietnam is also an important medical tourism destination. General Statistic Office revealed that Vietnam accepted 300,000 foreigners for medical check-ups and 57,000 for in-patient care last year, which added USD 2 billion for the government as revenue. Băndoi et al. (2020) believed that there were relationships between tourism development, quality of life, and sustainable performance. Tourism can be a catalyst for environmental crises. We recognize the phenomenon of overcrowding or tourist overload and the phenomenon of artificial inflation by growing prices at the level of tourist destinations and thus all the adverse effects on local communities, including aspects of their quality of life. (Andereck & Nyaupane, 2011, Dolnicar & Lazarevski, 2013)

Under these conditions, hotel operators seek to offer more convenient services and introduce more promotional offers to attract customers. Hotels would like to grow their market shares and boost profitability. However, the marginal advantages of marketing campaigns are starting to decrease as most actors have similar plans. Keeping in mind that information is available at the end of the article on this restriction, some hotels now prefer to enhance customer service. The hotel industry's quality of service involves a constant evaluation to ensure a high standard of service quality in various service parameters. This study investigates using fuzzy multi-criteria decision-making to rank and evaluate hotel service quality to address this critical issue.

Here is this paper's structure: The second part presents previous research on service quality assessment and the MCDM method in the hotel industry. The proposed method and its steps are detailed in the third section. Next, a real case study is provided to determine the level of service quality in some Vietnamese hotels. After that, the findings and remarks are to be found in the final section.

2. Literature Review

The hotel industry has become one of the world's most dynamic service industries. Excellent service quality plays the most significant role for competition in the hotel industry. Not only does service quality has a positive and direct influence on competition, but it also creates positive influence through some other factors, such as occupancy level and average direct costs. Quality of service has become necessary for tourism's sustainability and tourism growth worldwide (Tran et al., 2020).

In this context, quality of service has been addressed in various studies, and several models help in building the quality of service (Asubonteng et al. 1996; Caceres & Paparoidamis, 2007; Caruana, 2002; Ghotbabadi et al.,2015; Gorla et al., 2010; Gronroos, 1984, 1988; Haywood-Farmer, 1988; Kasiri et al., 2017; Orueta et al., 2016; Yarimoglu, 2014; Zeithaml et al., 2002). The literature uses different approaches to evaluate the quality of service. The SERVQUAL approach assumes that customers' perception of service quality is the only valid factor for calculating service quality. This approach is based on a questionnaire and takes the desires and preferences of guests into account. SERVQUAL is, however, unable to apply for rating services because it represents the long-term customer mentality on service qualities.

The emerging trend of full quality control in the hotel industry means that the hotel companies have a competitive edge and therefore undergoes new research on hotel service quality. The definition and conceptual model of service quality are essential if anyone wants to understand the genesis of service quality and future quality gaps. The hotel industry is more and more focused on the customer perception of service quality. Knowing customer perceptions gives hotels the possibility to develop strategies that lead to customer satisfaction. A customer satisfaction management strategy can boost customer loyalty and increase the positive image of a tourist destination. Therefore, it is essential to explore the value of hotel attributes to hotel customers in selecting hotels. Research on the subject of guest satisfaction, which considers whether or not guests return to a hotel or warn other visitors, is central to the hospitality industry's success. Neglecting to pay attention to those hotel qualities is considered crucial by the guests. It contributes to a negative assessment of the hotel, reducing the likelihood of a repeat of the patronage. Gržinić (2007) introduced a quantitative and qualitative model of quality of service (SERVQUAL). The value of service quality in the hotel industry is calculated from a conceptual and quality assessment perspective. Dominici and Guzzo (2010) used a qualitative study of a large hotel in Sicily to determine the overall level of customer satisfaction for the hotel and each service rendered.

For competitive advantages, building companies are also forced to identify strategies and tools to differentiate themselves from their competitors in the hotel industry. As the industry itself does not have many differentiating ways, management focuses on increasing service quality and customer satisfaction to create and develop long-term customer relationships and customer loyalty. On the other hand, dimensions, quality of service, customer satisfaction, and loyalty significantly impact companies' corporate success and market positions. Several research studies in different fields confirmed these relationships and the significance of service quality, but only a few of them were implemented in the hotel industry (Sila & Ebrahimpour, 2002). In early research, Parasuraman et al. (1985) proposed

service quality dimensions by reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and knowing the customers and tangibles. Berry et al. (1990) defined five key dimensions that consumers use to assess a business's service, including tangibles, reliability, responsiveness, assurance, and empathy. And then, there were three ideas for troubleshooting in the customer service: Encouraging consumers to complain and make it easier for them to do; Making prompt, personal contact with customers a vital part of the Customer Service Program; Encouraging and provide workers with the means to respond efficiently to customer problems.

Despite its wide application, the SERVQUAL model has some deficiencies, and its conceptual foundation and empirical operationalization have been argued in research (Higgs et al., 2005; Landrum et al., 2007). According to the research of (Rozman et al., 2009), the SERVQUAL model does not cover two main criteria: service delivery and the correlation between the quality of service and price. The service attributes used to measure the service quality may not reflect an exact standard of service quality and may not count all the service's critical characteristics. In addition, there are real drawbacks associated with interviewing respondents before and after the use of the service; this is the so-called gap indicator. To be more precise, Augustyn and Seakhoa-King (2004) showed that the SERVQUAL scale is an essential but inadequate quality measure in the tourism sector, with clear implications for future research. In today's competitive world economy, the tourism sector is one of the key players in almost all developed and developing countries. Multi-criteria decision-making (MCDM) methods, referring to screening, prioritizing, ranking, or selecting a set of alternatives, usually under independent, incommensurate or conflicting attributes, are the most active research areas in the literature and have been applied in a wide range of decision areas (Aldalou & Percin, 2020; Brauers & Zavadskas, 2006; Fasanghari & Montazer, 2010; Giannakis et al., 2020; Ishtiaq & Siddiqui, 2019; Nguyen et al., 2020a; Nguyen et al., 2020b; Nguyen et al., 2020c; Nguyen et al., 2020d; Singhal et al., 2018; Škrinjarić, 2020; Yalcin et al., 2012; Ying-Yu & De-Jian, 2011) .

Because of certain shortcomings of the SERVQUAL process, As studied by Hu et al. (2012), this study established and created a set of evaluation indicators tailored to the household sector by discussing literature and interviewing experts to make the evaluation process more detailed and realistic. MCDM may be implemented where evaluation needs various variables that cannot easily be translated into observable units, and many conflicting parameters are likely to influence the assessment. Although many researchers use MCDM methods in other fields, only a few researchers use MCDM methods to evaluate the hotel service quality problems. Therefore, this study aims to address the quality assessment of hotel services by applying the Fuzzy AHP -qualitative MCDM methodology.

3. The Proposed Method of Fuzzy Analytic Hierarchy Process

3.1. Fuzzy Analytic Hierarchy Process

The fuzzy set theory has been developed to deal with the concept of partial truth values ranging from absolutely right to absolutely false. Fuzzy set theory has become the primary tool for handling imprecision or vagueness, aiming at tractability, robustness, and low-cost solutions for real-world problems. According to Zadeh (1975), it is complicated for conventional quantification to reasonably express complex situations, and it is necessary to use linguistic variables whose values are words or sentences in a natural or artificial language. The potential of working with linguistic variables, low computational cost, and ease of understanding are characteristics that have contributed to the popularity of this approach. Zadeh also states, "The notion of a fuzzy set provides a convenient point of departure for the construction of a conceptual framework which parallels in many respects the framework used in the case of ordinary sets, but is more general than the latter and, potentially, may prove to have a much wider scope of applicability.".

The FAHP approach performs AHP (Saaty, 1988) in a fuzzy environment to address uncertain, imprecise experts' judgments through linguistic variables or fuzzy numbers. There are several FAHP methods proposed by various authors (Buckley, 1985; Chang, 1996; Mikhailov, 2004). The earliest work on FAHP was by Van Laarhoven and Pedrycz (1983), which compared fuzzy ratios described by fuzzy triangular numbers. In the method, fuzzy weights are derived from fuzzy comparison matrices via a fuzzy logarithmic least squares method. Buckley (1985) determined fuzzy weights of comparison ratios with trapezoidal fuzzy numbers using the geometric mean method. Chang (1996) proposed an extent analysis method for FAHP, using fuzzy triangular numbers for pairwise comparison matrices to derive crisp weights. After that, Mikhailov (2004) suggested a fuzzy prioritization method to obtain crisp weights from fuzzy comparison matrices via nonlinear optimization. The weights of the criteria proposed in this study were determined using the fuzzy AHP technique. This study is applied tothe FAHP methods proposed by Chang (1996).

The steps applied until the criteria weights were determined in the method are given below:

Step 1: a hierarchy was developed to turn a complicated problem into a raw form.

Step 2: the relative importance of each criterion was determined from expert views, and a comparison matrix was constructed based on the membership function of linguistic scale and Fuzzy number (Table 1). The resulting pairwise comparison matrix is defined in equation (1).

Table 1: Proposed Membership Function of Linguistic Scale

Fuzzy Number	Linguistic	Scale of Fuzzy Number
9	Perfect	(8, 9, 10)
8	Absolute	(7, 8, 9)
7	Very Good	(6, 7, 8)
6	Fairly Good	(5, 6, 7)
5	Good	(4, 5, 6)
4	Preferable	(3, 4, 5)
3	Not Bad	(2, 3, 4)
2	Weak Advantage	(1, 2, 3)
1	Equal	(1, 1, 1)

$$
Z = \begin{bmatrix}
(1,1,1) & l_{21}m_{21}u_{21} & \cdots & l_{1n}m_{1n}u_{1n} \\
l_{21}m_{21}u_{21} & (1,1,1) & \cdots & l_{2n}m_{2n}u_{2n} \\
\vdots & \vdots & & \vdots \\
l_{n1}m_{n1}u_{n1} & l_{n2}m_{n2}u_{n2} & & (1,1,1)
\end{bmatrix} \tag{1}
$$

All elements of the matrix (l_{ij}, m_{ij}, u_{ij}) indicate the important values of the criteria. The importance of analyzing the ith data for the m target was found according to the following symbols. All of (*j:* 1, 2, …, m) M_{gi}^{j} were fuzzy triangular numbers. Moreover, $X = (x_1 x_2,…,x_n)$ was the decision set, and $T = (t_1, t_2,…t_n)$ was the target of matrix.

$$
M_{gi}^{1}, M_{g2}^{2},…,M_{g3}^{m}, i = 1,2,…,n \tag{2}
$$

Step 3: the fuzzy values in each criterion's whole target set were summed separately, and the $\sum_{i=1}^{m} M_{gi}^{i}$ value was obtained.

$$
\sum_{i=1}^{m} M_{gi}^{j} = \left(\sum_{j=1}^{m} l_j, \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j \right) \tag{3}
$$

Step 4: each fuzzy value in the decision set was summed, and $\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{j}$ was obtained. The inverse vector of $\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{j}$ was then calculated.

$$
\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{i} = \left(\sum_{i=1}^{n} l_i, \sum_{i=1}^{n} m_i, \sum_{i=1}^{n} u_i \right) \tag{4}
$$

$$
\left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j} \right]^{-1} = \left(\frac{1}{\sum_{i=1}^{n} u_i}, \frac{1}{\sum_{i=1}^{n} m_i}, \frac{1}{\sum_{i=1}^{n} l_i} \right) \tag{5}
$$

Step 5: the synthetic extent value (S_i) for each criterion was calculated by equation (6).

$$
S_i = \sum_{j=1}^{m} M_{gi}^{j} * \left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j} \right]^{-1} \tag{6}
$$

Step 6: the degree of possibility of $M_1(l_1, m_1, u_1) \geq M_2(l_2, m_2, u_2)$ was given as equation (7).

$$
V(M_1 \geq M_2) = \sup_{x \geq y} \left[\min (\mu_{M_1}(x), \mu_{M_2}(y)) \right] \tag{7}
$$

Equation (8) was used to calculate the ordinate of the highest intersection point.

$$
V(M_2 \geq M_1 = \text{hgt}(M_2 \cap M_1) = \begin{cases} 1 \\ 0 \\ \dfrac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)} \end{cases}
$$
$$
\text{if } m_2 \geq m_1, \quad \text{if } l_1 \geq u_2 \text{ otherwise} \tag{8}
$$

Step 7: the degree possibility of a fuzzy convex point being greater than z convex fuzzy points $M_i (i = 1,2,…,z)$ can be shown by equation (9).

$$
V(M \geq M_1, M_2,…,M_z) = V[(M \geq M_1);(M \geq M_2);…;
$$
$$
(M \geq M_z)] = \min V(M \geq M_\rho), \ p = 1,2, … , z \tag{9}
$$

Assuming that $z \neq \rho$ and z = 1, 2, …, and *n* conditions are fulfilled, equation (10) applies.

$$
d'(A_\rho) = \min V(S_\rho \geq S_z) \tag{10}
$$

If $A_\rho (\rho = 1,2,…,n)$ are *n* elements, then equation (11) applies

$$
W = \left(d'(A_1), d'(A_2),…,d'(A_n) \right)^{T} \tag{11}
$$

Step 8: normalized weight vectors were obtained.

$$W = (d(A_1), d(A_2), \ldots, d(A_n))^T \qquad (12)$$

3.2. Aggregation of group decisions

The analytical step (II) mentioned above refers to the aggregation of the group evaluations. Fuzzy pairwise comparisons can be combined by use of the following algorithm (Chang & Wang, 2009):

$$l_{ij} = \min(l_{ijk}), m_{ij} = \left(\prod_{k=1}^{K} m_{ijk} \right)^{1/K}, u_{ij} = \max(u_{ijk}) \qquad (13)$$

Where $(l_{ijk}, m_{ijk}, u_{ijk})$ is the fuzzy evaluation of sample members k ($k = 1, 2, \ldots, K$). However, min and max operations are not appropriate if the sample has a wide range of upper and lower bandwidths; in other words, if evaluations are inhomogeneous. We have to consider that if only one or a few decision-makers deliver extreme l_{ijk} and u_{ijk} the whole span of fuzzy numbers (l_{ij}, m_{ij}, u_{ij}) gets huge. Due to the required number of multiplication and addition operations, the aggregated fuzzy weights can even exceed the 0–1 borders or become irrational (Mikhailov, 2003), which is, of course, unsatisfactory. Therefore, we decided to use the *geometric mean* also for *lij* and *uij* Which delivers satisfying fuzzy group weightings. Geometric mean operations are commonly used within the application of the AHP for aggregating group decisions (Davies, 1994):

$$l_{ij} = \left(\prod_{k=1}^{K} l_{ijk} \right)^{1/K}, m_{ij} = \left(\prod_{k=1}^{K} m_{ijk} \right)^{1/K}, u_{ij} = \left(\prod_{k=1}^{K} u_{ijk} \right)^{1/K} \qquad (14)$$

4. A Case Study

4.1. Proposed Criteria Based on SERVQUAL

SERVQUAL model has five critical dimensions for assessing service quality: Tangibles, Reliability, Assurance, Empathy, and Access. The questions were prepared based on the service quality requirements proposed in SERVQUAL. In this paper, the design questionnaire is based on the previous kinds of literature and the interviews. The SERVQUAL questionnaire is the main base in Table 2:

- **Tangibles** are known as physical structures, appliances, and the presence of employees.
- **Reliability** is defined as the ability to produce the advertised service in a timely and accurate manner.
- **Assurance** is known as understanding and courtesy of employees and their willingness to encourage faith and trust.

- **Empathy** is recognized as the amount of personalized attention the organization gives to its customers.
- **Access** involves approachability and case contact.

This study examined the literature evaluating hotel, tourism, and travel areas prior to determining the criteria and alternatives. In the next stage, a sample of decision-makers consisting of academic experts in tourism, management information systems, and industrial engineering was constructed.

The identified criteria were then presented to the 12 experts, and their feedback was taken into consideration. After that, sub-criteria were added to the criteria, respectively (Table 2).

In this stage, the criteria' significance levels were determined through the 12 decision-makers' evaluations, and the hotel service quality was evaluated and ranked by the decision-makers based on existing criteria. The criteria' weights were first determined with the fuzzy AHP proposed by Chang (1996) Extent Analysis Method. The data was solved by Excel.

4.2. Results and Discussions

As it is shown in Table 3, Tangibles (C1) was identified as the most important dimension to assess service quality in the hotel industry according to the criteria weights. Assurance (C3) was placed in the second rank, considering its lower weight. Reliability (C4), Empathy (C2), and Access (C5) were finally comprised the next priorities for increasing of satisfaction about the service quality in this study. Sub-dimensions were prioritized for the satisfactory service quality by looking at the weights obtained from the paired comparison tables.

The order of top ten priority is: 1- Employees give guests individualized attention and make them feel special (C41), 2- Accurate Records (C23), 3- Employees understand the specific needs of guests (C42), 4- Services Consistency (C33), 5- Services Flexibility to Guests' Demands (C32), 6- Providing the services at the time it promises (C22), 7-Solve guest's complaints and compensates for the inconveniences (C31), 8- Hotel and its facilities have convenient hours for all their guests (C51), 9-Necessary arrangements for disabled people (C43), and 10- Easy access to the hotel (C52), perspectively.

Regarding research of (Akbaba, 2006; Blešić et al., 2014; Devi Juwaheer, 2004; Gržinić, 2007; Mey et al., 2006; Ryan, 1991), they confirmed the five-dimensional structure of SERVQUAL; however, some of the dimensions found and their components were different from SERVQUAL. They also pointed out that tangibles and assurance had the highest expectations for the hotel service quality dimension. Their findings also confirmed that, although the SERVQUAL scale was a handy tool as a concept, it needed to be adapted for the specific service segments and for the cultural context within which it was used.

Table 2: Proposed Criteria

Criteria	Sub-criteria (S_c)
Tangible (C1)	(C11)-Visually appealing (buildings and facilities). (C12)-The hotel units (dining rooms, meeting rooms, swimming pools, etc.). (C13)-Modern equipment to looking good (air conditioning, furniture, elevator, communication devices, etc.). (C14)-The atmosphere and equipment are comfortable and appropriate for stay (beds, chairs, lounges, etc., comfortable, clean, and tranquil). (C15)-Works properly of equipment without causing breakdowns. (C16)-Adequate and sufficient materials for services (soap, shampoo, towel, etc.). (C17)-Food and beverages served and prepared hygienically adequate and sufficient. (C18)-The good appearance of hotel employees (as uniforms and personal hygiene).
Reliability (C2)	(C21)-Services realized as promised and accurate. (C22)-The hotel provides the services at the time it promises to do so. (C23)-It keeps accurate records (reservation, guest records, bills, orders, etc.). (C24)-Of the employees, whenever necessary.
Assurance (C3)	(C31)-The hotel to solve guest's complaints and compensates for the inconveniences. (C32)-The hotel provides flexibility in services according to guests' demands. (C33)-Consistency of services provided. (C34)-Knowledge of employees about the work that is doing (professional abilities, foreign language, communication abilities, etc.), provide information and assistance to guests.
Empathy (C4)	(C41)-Employees give guests individualized attention and make them feel special. (C42)-Employees understand the specific needs of guests (C43)-The hotel is convenient for disabled guests (necessary arrangements made for the disabled).
Access (C5)	(C51)-The hotel and its facilities have convenient hours for all their guests. (C52)-Easy access to the hotel (transportation, loading and unloading area, car parking area, etc.). (C53)-Getting information about the hotel's facilities and services are easy (reaching transmission via phone, Internet, etc., direction signs, etc.)

However, Devi Juwaheer (2004) suggested that the overall service quality level was primarily derived from the Reliability factor. Furthermore, Fah and Kandasamy (2011) found that Ecological factors and Technological aspects were significantly related to customer satisfaction. Meanwhile, as studied by Poku et al. (2013), their research has shown that customer satisfaction is not only based on hotel rankings but on the quality of service that gives value for money that creates customer loyalty. In addition to the responsiveness variables, the Empathy and Assurance variables have had a considerable effect on the guests' consumer loyalty.

Recently, Beheshtinia and Farzaneh Azad (2019) found that quality enhancement in the hospitality industry can lead to satisfied customers, increase the number of visitors and have a positive effect on the GDP of countries using a hybrid model using the House of Quality (HOQ), SERVQUAL, and Kano models for the hotel industry under budget constraint. It means that quality service problems received extensive attention and need a hybrid method to crack.

Nevertheless, Shafiq et al. (2019) use SERVQUAL to measure Generation Y's perceived service quality and its effects on the Malaysian hotel industry's satisfaction. They revealed that all the elements of SERVQUAL, except tangibility, had a significant and positive relationship with customer satisfaction. It is a fact that this was a niche area of research done on particular consumers in Malaysia. It, therefore, adds to the emerging field of tourism concerning Gen Y. It is evident that as competition becomes more intense and environmental factors become more hostile, the concern for hotel service quality grows. If service quality is to become the cornerstone of marketing strategy, the marketer must have the means to measure it.

Taken together, our study illustrates how different quality elements affect customer satisfaction in hotel service quality. Moreover, our findings imply that other customer groups can have disparate desires and priorities. As mentioned before, the purpose of this study is to construct a comprehensive fuzzy framework to study customer satisfaction and hotel-quality service management.

Table 3: Fuzzy AHP Results of Weights and Rankings

Criteria	W_concept	Rank concept	W_local	Local Ranking	W_global	Global Ranking
C1	0.2268	1	0.1730	1	0.0392	12
			0.1685	2	0.0382	13
			0.1193	4	0.0271	18
			0.1145	5	0.0260	19
			0.1024	6	0.0232	20
			0.0713	8	0.0162	22
			0.0840	7	0.0190	21
			0.1672	3	0.0379	14
C2	0.2055	4	0.1596	4	0.0328	17
			0.2712	2	0.0557	6
			0.3869	1	0.0795	2
			0.1823	3	0.0375	15
C3	0.2194	2	0.2348	3	0.0515	7
			0.2567	2	0.0563	5
			0.3161	1	0.0693	4
			0.1925	4	0.0422	11
C4	0.2165	3	0.4325	1	0.0508	1
			0.3407	2	0.0556	3
			0.2269	3	0.0684	9
C5	0.1318	5	0.3899	1	0.0514	8
			0.3432	2	0.0452	10
			0.2669	3	0.0352	16

5. Conclusions

This study analyzes the importance of service quality in the hotel industry, considering the perception versus the expectation, through the FAHP based SERVQUAL method. The results showed that the quality of services provided in various items that expectation is above perception. The hotel can behave in areas related to their points of difference between expectations and perception of the quality of the services provided. They should maintain the positive factors and reassess the procedures of conflicting aspects. As with all the studies, there are unavoidable limitations to even this study that are worth discussing. Several service quality attributes were ignored to make the research uncomplicated. Although we do not expect these attributes to significantly affect customer satisfaction on hotel service quality as much as we discussed, it is suggested that these factors should be further explored in future research. Moreover, our questionnaire restricted respondents to say their opinion on specific service quality attributes. It is recommended that future studies could provide grounds for respondents to comment on which services they want more. Another limitation of the study is that it has been restricted to the hotel industry, where the results may not be applicable to other countries. Thus, future studies could examine this multi-method approach in other countries.

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