

Research Article

Evaluating the Performance of Taiwan Homestay Using Analytic Network Process

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Homestay industry in Taiwan is not only thriving, but also its operation is moving gradually toward elaboration strategy and in a specialized-operation manner these years. Nevertheless, the evaluation frameworks of the earlier studies were sporadically constructed from an overall perspective of homestays. Moreover, the functions, operational model, and natures of homestays are dissimilar to those of hotels; therefore, if the evaluation criteria of homestays employ the ones of hotels, it would appear to be incoherent and incompatible. This study has accordingly developed and constructed a set of evaluation indicators tailor-made for homestay sector through discussion of literatures and interviewing experts so that the evaluation framework would be more comprehensive and more practical. In the process of interviewing experts, it was discovered that dependences lay on the aspects and criteria. Consequently, this research chose the ANP (analytic network process) to get the weights and, further, to acquire the homestay business performance through fuzzy theory. The result reveals, as regards key aspects, homestay proprietors and customer groups both weight the surroundings of the building and features, service quality, operation, and management most. In respect to overall homestay performance, customer groups consider it has reached the satisfactory level.

1. Introduction

The growing work pressure has made travelling as the best way to relieve stress in a society pursuing high efficiency [1]. In the wake of increased incomes, better living, change of traditional values, and convenient traffic network as well as more leisure time, the demand of recreational activities are swelling in Taiwan. Recreational activities and tourism has steadily become part of modern life [2], which has driven a multiaspect development of Taiwan domestic tourism and recreational market. The most considerable development and evolvement lie in the accommodation business at tourism attractions, also known as homestay [3]. Homestays are the best Taiwan promoters. If any tourists from all over the

world visit Taiwan and stay in homestays, hosts of homestays not only can introduce them the local cultures and past, but also can act as tour guides as well as good public relation practitioners. Homestays, therefore, play a very essential role. Homestays accordingly are with crucial marketing functions and can drive local economic development. On these grounds, the authors have deemed homestay is an important and discuss-worthy issue.

Based on the World Tourism Organization data, concerning global tourism market, there are approximately seven hundred million people travelling abroad every year. The scale of global tourism sector including both domestic and international tour takes up over 10% of the global GDP (gross domestic product), which has reached an amount of 3.5 trillion US dollars. Tourism 2020 Vision, which was published by the World Tourism Organization in 2001, also indicated that the number of tourists in 2020 would reach 1.56 billion persons, showing a growth of 1.76 times comparing to the 565 million persons in 1995 [4]. In addition, according to the Taiwan Tourism Bureau [5], the total tourism revenue in Taiwan had reached TWD\$514 billion in 2010, and the number of visitors has been growing significantly for a decade. In 2011, the number of in-bound visitors to Taiwan was 6.09 millions, which was an all-time peak and showed a growth of 9.34% compared to the number in 2010. Visitors with "pleasure" purpose were 3.63 million persons, which was up by 11.95%. The ones with business purpose were 984.85 thousand persons, showing an increase of 5.02%. In view of the data above, the number of inbound visitors has kept rising, which would benefit the development of Taiwan industries of tourism, recreation, hospitality, and accommodation.

On top of that, the Taiwan Council for Economic Planning and Development revealed that Taiwan residents' expenditures in recreational and cultural consumption were increasing significantly in 2010 with a real growth rate at 9.88%, up by 0.98 percentage point compared to 2011. The annual growth rate of consumer expenditures in restaurants and lodging has reached 8.11%, up by 0.22 percentage point compared to 2001 [6]. Regarding the expected utility of the development plans of six emerging industries (biotech, tourism, green energy, medical and caring, boutique farming, culture, and creativeness), the Taiwan Council for Economic Planning and Development [7] proposed that the entire revenue of tourism will increase from TWD\$402.2 billion in 2008 to TWD\$550 billion in 2012, including TWD\$ 300 billion from tourism foreign exchange earning. Further, in 2012, it will attract private investment with TWD\$200 billion. In view of the above, it not only demonstrates leisure and entertainment activities certainly carrying weight in Taiwan people's life, but also highlighting immense business potentials in tourism market.

Taiwan is promoting itself to be a "Green Silicon-Valley Island" for sustainable tourism; thus, tourism has become one of the major development targets. Homestay sector has shot up among the trends of recreational farming and ecotourism. According to Taiwan Tourism Bureau [8], the number of approved homestays has swelled from 1,237 in January 2006 to 3,397 in January 2012, with an increase number of 2,160. The homestay sector, on this ground, is not only prosperous, but also with immeasurable business opportunities in tourism sector. In recent years, the operation of homestays has developed into an elaborate and specialized manner. With marketing and media promotion, it has become an important option when people engage in recreational activities and has further turned into an emerging sector with great potential [9]. The Regulations for the Management of Home Stay Facilities [10] have been implemented for years since December 12, 2001, and approved homestays would receive validation certificates. But good ones always mingling with black sheep, some opportunists have entered this sector and often left negative images, which would impact consumers' image about homestays [3]. The Chief Secretary of Taiwan Tourism Bureau, Wayne Liu (the present Deputy Director General), said that there would be a classified

evaluation for Taiwan's approved homestays in the future. The preliminary plan was to categorize them into fourteen groups, which are architecture, room features, landscape, ecology, culture, aboriginal, experiential activities, sport activities, bicycling, hot spring, tour guiding service, language, industrial heritage, and miscellaneous so that people could clearly know each homestay's features [11].

In order to safeguard visitors' lodging interests, choices of recreational commodities and its safety, as well as maintaining the quality of recreational activities while enjoying the vocation, appropriate evaluation items for Taiwan homestay quality validation should be set up by weighing up multi-aspect evaluating items so that applicable, impartial validation assessment and criteria could be accordingly established [12]. The earlier homestay studies were mainly about customer satisfaction [13–15], marketing strategies [16–18], experiential marketing [19–21], operation and management [22–26], and consumer behaviors [27–30], but few were from an overall perspective to construct homestay evaluation framework. Furthermore, the homestay sector is showing a thriving trend and it is hoped that an evaluation mechanism could be formed through this research; notwithstanding, the main distinguishable features of homestay operation different from those of hotels are that homestays lay more stress on (1) inexpensive price and help-your-self service, (2) not emphasizing luxury facilities, but aware of safety issue and hygiene facilities, (3) its service might not be full-scaled, but is with hospitality, local color, and homeliness. What is more important is that homestays make use of nature resources and local cultures in order to let visitors be able to experience the local social customs in person. On top of these, homestays can provide functions like sport, recreation, amusement, and so on to make visitors fully enjoy their leisure time [31]. On these accounts, it is obvious that the homestays and hotels vary in their functions, business model, and natures [3, 12, 32–34]; therefore, if the hotel evaluation criteria are applied indiscriminately to homestays, it would appear to be unconnected and illogical. This research hence deems that it is vital and crucial to develop and construct applicable homestay evaluation indicators, which is one of the motives.

On the other hand, beside homestay validation, such as "hospitable homestays", there is sporadic research into homestay evaluation indicators. For example, Ou and Gian [31] made researches into leisure farming homestay visitor characteristics and needs, whose measure aspects were facilities, service, landscape, operation, and management. Yen et al. [34] studied the homestay evaluation indicators, whose measure aspects were infrastructures, service quality, features of resources, and the association with communities. Chen [35] has constructed evaluation indicators for Taiwan green homestays, whose measure aspects were green building, sustainable landscape engineering, organic farming, environment education, community co-prosperity, and so forth. Shi [12] researched Taiwan homestay quality validation, whose measure aspects were surroundings and facilities, business features, service quality, and community participation. To conclude, it is found that most underlined the hardware, service quality, or exterior settings. It was discovered in the interview process that the forementioned measure aspects are essential to the current external context; however, with respect to evaluation, it should be brought back to the homestay's natures and geist, such as the interaction between the homestay hosts and guests. This study has thus added the aspect of "homestay geist and community co-prosperity" into the final framework and discussed its nuances, which is another motive.

At the end, it found that there is dependence among aspects and criteria of the homestay evaluation. Saaty [36] suggested employing ANP to solve the decision-making issues of dependence. Zadeh [37] introduced fuzzy set theory in 1965, which is to address the uncertainties arising from subjective belief by quantitative methods, and by fuzzifying, it

would provide a better promotability, error tolerance, and is better for applying to the real-world nonlinear system [38].

The following structures of this paper are: Section 2 is the constructing process of the research framework, mainly by literature review and interviewing experts; Section 3 is about methodology, including majority rule, ANP (analytic network process) and Fuzzy Theory; Section 4 is about empirical results; Section 5 is conclusion and suggestions.

2. Constructing the Framework

2.1. Preliminary Framework

This research has organized the evaluation aspects and criteria of the preliminary framework by literature review as Table 1, covering six aspects and 33 criteria.

2.2. Final Framework

After settling the preliminary framework, 3 academic and field experts were invited. After interviewing them, a final framework was established accordingly. It is hoped that the final framework could be a comprehensive one and meet homestays' situation in real practice.

Experts in this research are as follows. Expert A is an academic expert, who has been teaching in a technology university for 8 years and whose expertise is leisure farming, long stay, and marketing and management of recreational business. His papers were all related to recreational industry and he had worked in agricultural public service for 18 years. Currently he is also holding a position as director in two recreational associations. Expert B and C are the ones in practice. They are not only holding positions as director in homestay-related association, but also running homestays. The operating experience of Experts B is approximately 10 years and that of Expert C is about 5 years. In conclusion, the expert group in this research is not only with expertise, but also with rich experiences. In other words, they are representative as expert. In addition, three interviews were conducted for this study and the framework was altered according to the expert group's opinions and suggestions (refer to the Appendix section). A final framework was accordingly formed as shown in Table 2, covering 5 aspects and 30 criteria. The definitions of aspects were elaborated in Table 3.

After finalizing the final framework, three experts were asked to fill up the relevancy among criteria, and a questionnaire was drawn up afterwards. This research considered that if there are too many questions, customers might have no patience or might be not willing to complete the questionnaire, and the result accuracy would thus decrease. In order to prevent this situation, the influential threshold of this research was set to 100 degree; that is, only if three experts all deem a criterion must fully influence another criterion, these two criteria would be considered to be with relevancy. The result is exhibited in Table 4.

3. Methodology

3.1. Majority Rule

Majority rule is a decision rule that selects alternatives which are the major consensus among most experts. Majority rule can be the more-than-half-vote rule or two-thirds rule [40]. On

Table 1: Preliminary framework.

Aspect	References	Criteria	References
Surroundings of the building and features	[32, 34]	To utilize natural ventilation sufficiently	[34, 35]
		To utilize plenty natural light	
		To use nontoxic paint	[35]
		To maintain the land's vitality and good condition in the process of design and construction	
		To incorporate the local heritage and landscape elements into design	[31, 35]
		The beautification and uniqueness of the interior design	[32, 34, 39]
Facilities	[31, 34, 39]	Greenization and uniqueness of the garden design	
		Cooking facilities such as kitchen and BBQ	[31, 34, 39]
		Parking space	[31, 32, 34, 39]
		Emergency lighting settings	[31, 39]
		Fire and safety	[31, 32, 34, 39]
		Medical aid	[31, 39]
		Room settings	[12, 31, 39]
Management	[39]	Room tidiness	[32, 34, 39]
		Room coziness	[30, 32, 34]
		Hygiene and surrounding cleanness	[32, 39]
		Local catering planning	
		Introduction of the homestay and resources	[31, 39]
		Overall ambience forming	[39]
Service quality	[12, 31, 32, 34]	Reception service (such as booking, checking out)	[39]
		Information	[31, 32, 34, 39]
		Guiding services	[31, 32, 34]
		Catering	[31, 32, 34, 39]
		Staff quality	[12]
		Service attitude	[30, 32, 34]
		Food quality	[12, 32, 34]
		Interaction with guests	[12, 32]
		Transportation and pick-up service	[12, 32, 34, 39]
Local activity arrangement	[31, 39]		
Privacy and safety	[34]	Lodging safety management	
		Lodging risk management	[12]
Business features	[12]	Room themes and features	
		Homestay features	

this basis, this research has set that all must agree have 100 degree (full influence) as the screening threshold when determining criteria relevancy.

Table 2: Final framework.

Aspect	References	Criteria	References
Surroundings of the building and features (A)	[32, 34]	To utilize natural ventilation sufficiently (A1)	[34, 35]
		To utilize plenty natural light (A2)	
		To use non-toxic paint (A3)	[35]
		To maintain the land's vitality and good condition in the process of design and construction (A4)	
		To incorporate the local heritage and landscape elements into design (A5)	[31, 35]
		The beautification and uniqueness of the interior design (A6)	[32, 34, 39]
		Greenization and uniqueness of the garden design (A7)	
Service quality (B)	[12, 31, 32, 34]	Service attitude (e.g., reception service, to treat lodgers with voice of the customers) (B1)	[30, 32, 34]
		Pick-up service (offering free pick-up service) (B2)	[12, 32, 34, 39]
		Information service (e.g., local hot spot, tour route planning) (B3)	[31, 32, 34, 39]
		Catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients) (B4)	[12, 31, 32, 34, 39]
Homestay facilities (C)	[31, 34, 39]	Cooking facilities (e.g., kitchen) (C1)	[31, 34, 39]
		Parking space (C2)	[31, 32, 34, 39]
		Safety facilities (e.g., emergency lighting setting, fire prevention settings) (C3)	[31, 32, 34, 39]
		Medical aid (e.g., first-aid box) (C4)	[31, 39]
		Room settings (C5)	[12, 31, 39]
Homestay operation and management (D)	[12, 39]	Room tidiness (D1)	[32, 34, 39]
		Room coziness (D2)	[30, 32, 34]
		Room privacy (D3)	[34]
		Safety (e.g., lodger insurance and room safety) (D4)	[12, Expert Interview]
		Room themes and features, for instance, oceanic themes (D5)	[12]
		Homestay features (e.g., aboriginal culture) (D6)	
		Overall ambience forming (D7)	[39]
		Overall tidiness and hygiene (D8)	[32, 39]
Homestay geist and community co-prosperity (E)	[12, 35], [Expert Interview]	Degree of interaction between hosts and lodgers (E1)	[12, 32]
		Guiding services (E2)	[31, 32, 34]
		Arranging local experiential activities and food (E3)	[30, 31, 39]
		Contribution for living quality of local community (E4)	[12, 34]
		Initiating preserving actions toward local resources (E5)	[35]
		Promoting and preserving local cultural resources (E6)	[Expert Interview]

Table 3: The definition of aspect.

Aspect	Definition
Surroundings of the building and features (A)	The entire exterior and interior design of the homestay. Local cultural features are demonstrated and incorporated into the homestay.
Service quality (B)	Customer satisfaction at services provided by homestay proprietors.
Homestay facilities (C)	Hardware of the homestay.
Homestay operation and management (D)	This section is about how the homestay proprietors manage, plan, and design its rooms and surroundings as well as how they guard roomers' lodging privacy and safety.
Homestay geist and community co-prosperity (E)	The homestay proprietors carry out the homestay operation in person and frequently interact with their guests and run the homestay business with a concept of incorporating into its local community in order to help local economic prosper.

3.2. ANP (Analytic Network Process)

In the real environment, there are many decision-making problems that cannot just take the pure hierarchical relationship to construct the framework, because the high- and the low-level element may exist the dependence relationship and interaction [41]. As a result, Saaty [41] advanced ANP which has dependence and feedback, and in 2001 [36], he recommended using ANP to solve the problem of interdependent relationships among the criteria or alternatives. In ANP, when nodes correspond to levels or components, that means there exists the network feedback in a system [42]. The elements in the nodes may influence some or all elements in other nodes. In the network, all the nodes can be source nodes, intermediate nodes, or sink nodes. The relationship in the network is represented by the arc, and the direction of arrow means dependence relationship [41]. When the two nodes have the external dependence, it will be represented by the two-way arrow; the nodes in the elements have the internal dependence, it will be represented by the circle arc [43].

ANP has four steps [41, 44] as follows.

Step 1. Establish the model and the framework. The question should be clearly described and decomposed a rational system.

Step 2. Do the pairwise comparison to get the priority vector. The decision makers are asked to answer the series of pairwise comparison of two random elements or criteria.

Step 3. Construct the supermatrix. The concept of super matrix is similar to the Markov chain (Saaty, 1996). To obtain the global priority vector of systematic dependence, we must put the local priority vector into each corresponding line element to get the super matrix.

Step 4. Choose the best alternative. The alternative getting the highest weight is the best alternative. In our study, we do not have the alternatives; therefore, we just finish from Step 1 to Step 3.

Table 5: Linguistic values representations for Likert's scale and fuzzy set.

Linguistic values	Likert's scale	Fuzzy numbers
Highly unsatisfactory	1	(0, 0, 20)
Unsatisfactory	2	(0, 20, 40)
Slightly unsatisfactory	3	(20, 40, 60)
Slightly satisfactory	4	(40, 60, 80)
Satisfactory	5	(60, 80, 100)
Highly satisfactory	6	(80, 100, 100)

3.3. Fuzzy Theory

Fuzzy sets theory was introduced by Zadeh [37] in 1965. This theory is about human beings' thoughts, inferences, and perceptions basically are within a certain degree of ambiguity. Therefore, a fuzzy logic is required to describe that something is good or bad or its condition in order to make up the shortcomings of two-value logic (yes-no, true-or-false choices) of traditional sets.

A linguistic variable is a variable with linguistic words or sentences in a natural language [45]. The performance can be treated as a linguistic variable defined in the closed interval $[0, 100]$, whereas a set of the six linguistic values (highly unsatisfactory, unsatisfactory, slightly unsatisfactory, slightly satisfactory, satisfactory, highly satisfactory) is called a term set, denoted by $T(\text{preference})$, with respect to the performance. Each linguistic value can be represented by a triangular fuzzy number, which is a fuzzy set in the universe of discourse that is both convex and normal [45, 46].

If the membership function of \tilde{A} is $\mu_{\tilde{A}}(X) : R \rightarrow [0, 1]$, then \tilde{A} is a fuzzy number which should satisfy the following conditions [47]: (1) $\mu_{\tilde{A}}(x)$ is convex; (2) $\mu_{\tilde{A}}(x)$ is normal such that a real number x_0 exists which makes $\mu_{\tilde{A}}(x_0) = 1$; (3) $\mu_{\tilde{A}}(x)$ is piecewise continuous. This study takes the triangular membership function which is the most common. Each linguistic value can be represented by a triangular fuzzy number (l, m, u) within the scale ranging from 0 to 100. An example of linguistic values described by triangular fuzzy numbers is demonstrated in Table 5.

In addition, while computing synthetic performance value, fuzzy numbers are often converted into a quantifiable value, which is defuzzification, also known as linguistic-numerical transformation [48]. In Table 5, for example, it is unsatisfactory is demonstrated as "20" $((0 + 20 + 40)/3)$ and thereafter should be followed by the same analogy. The way to compute the average performance value of the criteria in this research is that assuming there are two interviewees, A and B, they are evaluating a single criterion. If A thinks it is unsatisfactory, the corresponding value is (0, 30, 60). If B feels it is satisfactory, the corresponding value is (60, 80, 100). As a result, their average performance value of this criterion is $1/2 \odot ((0, 30, 60) \oplus (60, 80, 100)) = (30, 55, 80)$, and the defuzzified value is $1/3 \odot (30 \oplus 55 \oplus 80) = 55$.

4. Empirical Result

4.1. Validity and Reliability

The framework of this research is based on literature review and expert interviews; therefore, it is with content validity and expert validity. This research has employed Cronbach's α

Table 6: Cronbach's α value of aspect.

Aspect	Cronbach's α
Surroundings of the building and features (A)	0.76
Service quality (B)	0.83
Homestay facilities (C)	0.75
Homestay operation and management (D)	0.90
Homestay geist and community co-prosperity (E)	0.93

coefficient to assess the scale reliability. Cronbach [49] suggested that an α coefficient less than 0.35 would be deemed as low reliability, the one between 0.35 and 0.7 would be considered as mediocre reliability, and the one above 0.7 is high reliability. The result reveals that Cronbach's α coefficients of all aspects are above 0.7 as in Table 6, which indicates the scales of this research are with good reliability.

4.2. Scope, Objects, Questionnaire, and Sampling

Regarding researching scope, Hsinchu County was selected, including Zhubei City, Wufong township, Jianshih township, Emei township, Beipu township, Baoshan township, Cyonglin township, Xinfeng township (also known as Hong Mao Kang), Hengshan township, Hukou township, Jhudong township, Xinpu township, and Guansi township (also known as town of longevity). There are two aboriginal towns in Hsinchu, which are Wufong township and Jianshih township. Wufong township is habitat of Atayals and Saisiyats. Atayals and its Ubong Fiesta (worshipping ancestors) and Saisiyats and its Pastaa'i Fiesta (celebrating harvest) are all important local cultural assets. Jianshih township is also a place of Atayals, where has developed a homestay cluster with aboriginal cultures, such as Smangus. Both places possess abundant natural resources, such as hot and the springs, giant trees, Dabajian Mountain; in addition, the aboriginals are giving major efforts to growing high-mountain crops. These places are having great potentials in developing tourism with their leisure farming and cultural tourism. Besides, Emei township, Xinpu township, and Beipu township all possess rich Hakka cultural traditions and heritages, which is also with niches and worthiness to develop tourism. There are bountiful stones in Hengshan township, such as basalts, igneous rocks, and Septarian Boulders, which have attracted numerous stone enthusiasts and have formed another culture; furthermore, the Neiwan branch railway is the artery to maintain its local prosperity. To conclude, Hsinchu has strong aboriginal and Hakka color as well as cultural heritages, which are not only worthwhile to explore, but also with niches in developing in-depth tours. Moreover, this research has classified approved Hsinchu homestays. According to the result, homestays featured with landscape, ecology, and building play the key part; therefore, the evaluation alternative must cover at least two of the forementioned features. With Expert C's strong recommendation, two representative homestays were selected for the evaluation alternative, and their lodging guests were the research objects. Four parts are included in the questionnaire design: (1) pairwise comparison of aspects and criteria, (2) lodging satisfaction, (3) linguistic value for satisfaction, and (4) lodgers' demographics. Concerning people usually lodge in homestays only at weekend or on holidays, this questionnaire was distributed from December 24 2011 to January 18 2012, covering Christmas Eve, Christmas, New Year, and so forth, 50 copies were retrieved in Homestay A, which are one for the homestay host and 49 for the lodgers. 30 copies were

Table 7: Demographics distribution.

	Homestay A customer		Homestay B customer	
	Number	%	Number	%
Gender				
Male	22	44.9	8	28.6
Female	27	55.1	20	71.4
Age				
20 and below	6	12.2	3	10.7
21–40	26	53.1	24	85.7
41–60	17	34.7	1	3.6
61 and above	0	0	0	0
Marriage status				
Married	24	49	10	35.7
Single	24	49	16	57.1
Divorced	1	2	1	3.6
Widower/widow	0	0	1	3.6
Occupation				
Military/public/education service	7	14.3	2	7.1
Agriculture, fishery, and manufacturing	1	2	1	3.6
Service sector	8	16.3	8	28.6
Commercial/financial sector	9	18.4	4	14.3
Electronics manufacturing	7	14.3	6	21.4
Student	8	16.3	3	10.7
Homemaker	0	0	1	3.6
Freelancer	3	6.1	1	3.6
Miscellaneous	6	12.2	2	7.1
Education				
Junior high school and below	0	0	0	0
Senior high school	9	18.4	6	21.4
University/college	28	57.1	17	60.7
Graduate and above	12	24.5	5	17.9
Avg. monthly earning (NT\$)				
20,000 and below	11	22.4	5	17.9
20,001–40,000	15	30.6	7	25
40,001–60,000	13	26.5	13	46.4
60,001 and above	10	20.4	3	10.7

retrieved in Homestay B, two for homestay hosts and 28 for lodgers. 80 copies are all valid samples.

4.3. Demographics Analysis

According to Table 7, regarding gender, female plays the key role among the respondents. About age, the group of 21–40 years old is the most. For marriage status, most are married or unwed at Homestay A, and at Homestay B, most are unwed. With respect to occupation, Homestay A's guests majorly are working in commercial and financial sector and second major group is working in service sector, and the students. The group working in service

Table 8: An example of unweighted supermatrix.

	A	B	C	D	E
A	1		1	1	1
B		1	1	1	1
C		1	1	1	
D	1	1	1	1	1
E	1	1		1	1

Table 9: An example of weighted supermatrix.

	A	B	C	D	E
A	0.4286		0.25	0.2727	0.25
B		0.375	0.25	0.2727	0.25
C		0.125	0.25	0.0909	
D	0.4286	0.375	0.25	0.2727	0.25
E	0.1429	0.125		0.0909	0.25

sector is the largest and is followed by the one working in electronic manufacturing sector at Homestay B. About education level, most are holding college degree. Concerning average monthly earning, the group earning NT\$ 20,001–40,000 is the major one and is followed by the one earning NT\$ 40,001–60,000 at Homestay A, and most of the Homestay B's lodgers are from the one earning NT\$ 40,001–60,000.

4.4. Analyze the Key Aspects and the Key Criteria

The study got unweighted supermatrix, weighted supermatrix, and limiting supermatrix by Super Decisions Software which is for ANP (analytic network process). Taking one of respondents for example, the three matrices are showed as from Tables 8, 9, and 10.

4.4.1. Aspects

This research has verified that the CI (consistency index) value of each pairwise comparison's matrix is less than 0.1, and the values of limiting supermatrix were obtained by arithmetic average in order to get the rank of aspects as in Tables 11 and 12. According to Table 11, Homestay A's key aspects are homestay operation and management, surroundings of the building and features, and service quality. Key aspects of its customer group are homestay operation and management, service quality, and surroundings of the building and features. Both do not attach great importance to homestay facility and homestay geist and community co-prosperity. Based on Table 12, key aspects of Homestay B are service quality, homestay operation and management, and surroundings of the building and features. Its customer group's key aspects are homestay operation and management, service quality, and surroundings of the building and features. Both Homestay B and its customer group do not pay much attention to homestay facility as well as homestay geist and community co-prosperity.

Table 10: An example of limiting supermatrix.

	A	B	C	D	E
A	0.2452	0.2452	0.2452	0.2452	0.2452
B	0.2242	0.2242	0.2242	0.2242	0.2242
C	0.0773	0.0773	0.0773	0.0773	0.0773
D	0.3293	0.3293	0.3293	0.3293	0.3293
E	0.1240	0.1240	0.1240	0.1240	0.1240

Table 11: The rank of aspect importance of homestay A (limiting supermatrix value).

Aspect	Proprietor's	Rank	Customers'	Rank
A	0.2452	2	0.2080	3
B	0.2242	3	0.2280	2
C	0.0773	5	0.1585	4
D	0.3293	1	0.2637	1
E	0.1240	4	0.1419	5

4.4.2. Criteria

This research has verified the CI (consistency index) value of each pairwise comparison's matrix is less than 0.1, and the values of limiting supermatrix were obtained by arithmetic average in order to get the rank of criteria as in Tables 13 and 14. According to Table 13, the top 5 key criteria of the Homestay A are to utilize natural ventilation sufficiently, room tidiness, to utilize plenty natural light, safety (e.g., lodger insurance and room safety), and room coziness, and the top 5 key criteria of lodgers are room coziness, to utilize plenty natural light, to utilize natural ventilation sufficiently, safety (e.g., lodger insurance and room safety), service attitude (e.g., reception service and treating lodgers with voice of the customers). In addition, the bottom 5 criteria that Homestay A values are room themes and features (e.g., oceanic themes), promoting and preserving local cultural resources, cooking facilities (e.g., kitchen), contribution for living quality of local community, and medical aid (e.g., first-aid box). The bottom 5 criteria that Homestay A lodgers value are room themes and features (e.g., oceanic themes), the beautification and uniqueness of the interior design, to incorporate the local heritage and landscape elements into design, contribution for living quality of local community, and medical aid (e.g., first-aid box).

According to Table 14, the top 5 key criteria of Homestay B are catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients), service attitude (e.g., reception service, to treat lodgers with voice of the customers), homestay business features (e.g., aboriginal culture), room coziness, and pick-up service (e.g., offering free pick-up service). The ones of its lodgers are safety (e.g., lodger insurance and room safety), service attitude (e.g., reception service, to treat lodgers with voice of the customers), room coziness, pick-up service (e.g., offering free pick-up service), and catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients). Furthermore, the bottom 5 criteria that the Homestay B value are to maintain the land's vitality and good condition in the process of design and construction, the beautification and uniqueness of the interior design, room themes and features (e.g., oceanic themes), medical aid (e.g., first-aid box), and contribution for living quality of local community. The bottom 5 criteria that Homestay B lodgers value are greenization and uniqueness of the

Table 12: The rank of aspect importance of Homestay B (limiting supermatrix value).

Aspect	Proprietor's	Rank	Customers'	Rank
A	0.1830	3	0.2132	3
B	0.2610	1	0.2240	2
C	0.1447	5	0.1803	4
D	0.2458	2	0.2552	1
E	0.1654	4	0.1273	5

Table 13: The rank of criteria importance of Homestay A (limiting supermatrix value).

Criteria	Proprietor's	Rank	Customers'	Rank
A1	0.0910	1	0.0624	3
A2	0.0741	3	0.0628	2
A3	0.0617	7	0.0487	11
A4	0.0213	16	0.0123	24
A5	0.0180	21	0.0088	28
A6	0.0231	15	0.0112	27
A7	0.0202	18	0.0125	23
B1	0.0304	13	0.0544	5
B2	0.0210	17	0.0537	6
B3	0.0158	23	0.0162	21
B4	0.0424	10	0.0501	10
C1	0.0053	28	0.0119	25
C2	0.0193	19	0.0505	9
C3	0.0140	24	0.0284	16
C4	0.0015	30	0.0035	30
C5	0.0269	14	0.0403	14
D1	0.0856	2	0.0534	7
D2	0.0669	5	0.0688	1
D3	0.0441	9	0.0428	13
D4	0.0708	4	0.0603	4
D5	0.0101	26	0.0113	26
D6	0.0651	6	0.0464	12
D7	0.0379	11	0.0275	17
D8	0.0450	8	0.0512	8
E1	0.0310	12	0.0307	15
E2	0.0170	22	0.0254	18
E3	0.0119	25	0.0173	20
E4	0.0033	29	0.0047	29
E5	0.0192	20	0.0197	19
E6	0.0061	27	0.0131	22

garden design, to maintain the land's vitality and good condition in the process of design and construction, to incorporate the local heritage and landscape elements into design, contribution for living quality of local community, and medical aid (e.g., first-aid box).

In conclusion, both homestays set store by room coziness, but do not attach much weight to the medical aid (e.g., first-aid box), room themes and features (e.g., oceanic themes) as well as contribution for living quality of local community. Customer groups of

Table 14: The rank of criteria importance of homestay B (limiting supermatrix value).

Criteria	Proprietor's	Rank	Customers'	Rank
A1	0.0310	15	0.0552	7
A2	0.0282	17	0.0545	8
A3	0.0423	10	0.0483	10
A4	0.0115	26	0.0097	27
A5	0.0134	23	0.0074	28
A6	0.0110	27	0.0102	25
A7	0.0125	24	0.0102	26
B1	0.0717	2	0.0632	2
B2	0.0621	5	0.0602	4
B3	0.0230	18	0.0164	21
B4	0.0720	1	0.0568	5
C1	0.0174	22	0.0145	23
C2	0.0567	7	0.0568	6
C3	0.0308	16	0.0328	15
C4	0.0044	29	0.0028	30
C5	0.0459	9	0.0391	14
D1	0.0348	13	0.0413	13
D2	0.0652	4	0.0614	3
D3	0.0317	14	0.0497	9
D4	0.0595	6	0.0760	1
D5	0.0097	28	0.0147	22
D6	0.0693	3	0.0433	12
D7	0.0176	21	0.0236	18
D8	0.0348	12	0.0434	11
E1	0.0515	8	0.0311	16
E2	0.0415	11	0.0262	17
E3	0.0183	19	0.0165	20
E4	0.0027	30	0.0046	29
E5	0.0181	20	0.0175	19
E6	0.0116	25	0.0125	24

both homestays regard service attitude (e.g., reception service, to treat lodgers with voice of the customers), room coziness, and safety (e.g., lodger insurance and room safety), but do not attach much importance to incorporating the local heritage and landscape elements into design, medical aid (e.g., first-aid box), and contribution for living quality of local community.

4.5. Compare the Weight and the Performance of Criteria

According to Table 15, the top 5 key criteria of Homestay A customer group are room coziness, to utilize plenty natural light, to utilize natural ventilation sufficiently, safety (e.g., lodger insurance and room safety) and service attitude (e.g., reception service, to treat lodgers with voice of the customers). This customer group also deemed Homestay A performed well at most of these criteria, but not the one of service attitude (e.g., reception service, to treat lodgers with voice of the customers), of which the weight rank is 5 and performance is 7.

Table 15: The weight and the performance of criteria of Homestay A.

Criteria	Weight	Rank	Performance	Rank
A1	0.0624	3	247.0332	3
A2	0.0628	2	256.7336	2
A3	0.0487	11	186.0355	10
A4	0.0123	24	48.5820	23
A5	0.0088	28	34.2999	28
A6	0.0112	27	43.6726	25
A7	0.0125	23	51.1644	22
B1	0.0544	5	209.3067	7
B2	0.0537	6	160.3981	14
B3	0.0162	21	58.3286	21
B4	0.0501	10	195.9993	8
C1	0.0119	25	42.2324	26
C2	0.0505	9	187.3879	9
C3	0.0284	16	108.3439	17
C4	0.0035	30	12.9081	30
C5	0.0403	14	161.6255	12
D1	0.0534	7	217.9093	5
D2	0.0688	1	279.5624	1
D3	0.0428	13	161.3169	13
D4	0.0603	4	230.2385	4
D5	0.0113	26	39.5616	27
D6	0.0464	12	176.5603	11
D7	0.0275	17	111.5492	15
D8	0.0512	8	210.6188	6
E1	0.0307	15	111.0706	16
E2	0.0254	18	87.4298	18
E3	0.0173	20	58.7417	20
E4	0.0047	29	15.2610	29
E5	0.0197	19	66.3753	19
E6	0.0131	22	43.9704	24

Besides, the room coziness is the more outstanding one in the performance, of which the weight rank is 7 and the performance is 5. The bottom 5 criteria that customer does not attach much importance to are room themes and features (e.g., oceanic themes), beautification and uniqueness of the interior design, to incorporate the local heritage and landscape elements into design, contribution for living quality of local community, and medical aid (e.g., first-aid box). The Homestay A customer group felt Homestay A did not perform well on these criteria.

Based on Table 16, the top 5 key criteria of the Homestay B customer group are safety (e.g., lodger insurance and room safety), service attitude (e.g., reception service, to treat lodgers with voice of the customers), room coziness, pick-up service (e.g., offering free pick-up service), and catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients). The customer group deemed Homestay B performed well in most of these criteria, but not the pick-up service (e.g., offering free pick-up service), whose weight rank is 4 and performance is 7. Besides, the performance in utilizing natural

Table 16: The weight and the performance of criteria of Homestay B.

Criteria	Weight	Rank	Performance	Rank
A1	0.0552	7	134.8743	5
A2	0.0545	8	131.8385	6
A3	0.0483	10	112.2302	10
A4	0.0097	27	21.9683	27
A5	0.0074	28	16.0411	28
A6	0.0102	25	24.2880	25
A7	0.0102	26	24.0641	26
B1	0.0632	2	154.7361	3
B2	0.0602	4	129.8464	7
B3	0.0164	21	38.5182	20
B4	0.0568	5	140.3985	4
C1	0.0145	23	32.8570	23
C2	0.0568	6	125.0572	8
C3	0.0328	15	72.5805	16
C4	0.0028	30	6.3272	30
C5	0.0391	14	93.9949	14
D1	0.0413	13	103.7234	12
D2	0.0614	3	156.1340	2
D3	0.0497	9	121.2171	9
D4	0.0760	1	186.3346	1
D5	0.0147	22	33.9942	22
D6	0.0433	12	102.4864	13
D7	0.0236	18	56.9343	18
D8	0.0434	11	107.4946	11
E1	0.0311	16	79.6609	15
E2	0.0262	17	63.3136	17
E3	0.0165	20	38.2953	21
E4	0.0046	29	11.3007	29
E5	0.0175	19	39.2847	19
E6	0.0125	24	29.9663	24

Table 17: The linguistic value after defuzzification.

	Highly unsatisfactory	Unsatisfactory	Slightly unsatisfactory	Slightly satisfactory	Satisfactory	Highly satisfactory
A	0	34	54	69	84	100
B		26	45	68	85	

ventilation sufficiently is exceedingly good, whose weight rank is 7 and performance is 5. The bottom 5 criteria that customer group values are greenization and uniqueness of the garden design, to maintain the land's vitality and good condition in the process of design and construction, to incorporate the local heritage and landscape elements into design, contribution for living quality of local community, and medical aid (e.g., first-aid box). The group also deemed that Homestay B did not perform well in these criteria.

To conclude, customer groups of both homestays think the homestay they stayed in performed well in utilizing natural ventilation sufficiently, room coziness, and safety (e.g.,

Table 18: The homestay performance.

Homestay A customer				Homestay B customer	
No.	Result	No.	Result	No.	Result
1	SU	26	S	1	S
2	SS	27	S	2	HS
3	SS	28	S	3	SS
4	S	29	S	4	S
5	S	30	HS	5	S
6	HS	31	S	6	S
7	S	32	HS	7	HS
8	SS	33	S	8	HS
9	HS	34	S	9	S
10	SU	35	SU	10	S
11	SS	36	SS	11	S
12	S	37	S	12	SS
13	S	38	SS	13	S
14	S	39	SU	14	S
15	S	40	SS	15	HS
16	S	41	S	16	S
17	HS	42	SS	17	SS
18	SS	43	S	18	S
19	SS	44	S	19	HS
20	SS	45	S	20	HS
21	SS	46	S	21	S
22	S	47	S	22	S
23	SU	48	SS	23	S
24	SS	49	S	24	S
25	S	Overall	S (78)	25	S
				26	S
				27	HS
				28	S
				Overall	S (85)

Note. U: unsatisfactory.
 SU: slightly unsatisfactory.
 SS: slightly satisfactory.
 S: satisfactory.

lodger insurance and room safety), but not well in incorporating the local heritage and landscape elements into design, medical aid (e.g., first-aid box), and contribution for living quality of local community.

4.6. Synthetic Performance of Homestay

The values of highly unsatisfactory, unsatisfactory, slightly unsatisfactory, slightly satisfactory, satisfactory, and highly satisfactory were obtained through defuzzification and arithmetic average as in Table 17. The customer group satisfaction with the lodging homestay was further analyzed, and the result is as Table 18. The computing method is to classify by a concept of “distance”; for example, a Homestay A customer’s overall performance value is

83, which is not far from the option of satisfactory (84); that means it is close up to satisfactory, and it will show as satisfactory. According to Table 18, for Homestay A, 5 customers felt highly satisfactory, 25 customers considered satisfactory, the number of slightly satisfactory is 14 and the number of feeling slightly unsatisfactory is 5. Regarding Homestay B, there were 7 customers feeling highly satisfactory, 18 thought it was a satisfactory experience, and 3 felt slightly satisfactory. Overall, both of them are satisfactory.

5. Conclusion and Suggestion

5.1. Conclusion

With respect to key aspects, both homestays and their customer groups attach much weight to surroundings of the building and features, service quality, and homestay operation and management, only vary in rank. Moreover, Homestay A and its customer group both value the aspect of homestay operation and management most, and Homestay B takes service quality most seriously and its customer group attaches greatest importance to the homestay operation and management.

With respect to key criteria, both Homestay A and its customer group hold similar ideas, and the difference lays merely on the rank. Homestay A regards utilizing natural ventilation sufficiently as the most important issue, but customer group values room coziness the most. A greater discrepancy lays on service attitude (e.g., reception service, to treat lodgers with voice of the customers), in which the Homestay A's rank is 13, but the one of customer group is 5, and the room tidiness, in which the Homestay A's rank is 2, but the one of customer group is 7. The key criteria of Homestay B and its customer group are mostly the same, which are only different in their rank. Homestay B pays greatest attention to catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients), but its customer group lay greatest stress on safety (e.g., lodger insurance and room safety). Two large discrepancies between Homestay B and its customer group are safety (e.g., lodger insurance and room safety), for which the Homestay B's rank is 6, but its customer group's rank is 1, and homestay features (e.g., aboriginal culture), for which Homestay B's rank is 3, but the one of its customer group is 12.

Regarding importance rank of criteria and homestay performance, the top 5 key criteria of Homestay A's customer group are room coziness, to utilize plenty natural light, to utilize natural ventilation sufficiently, safety (e.g., lodger insurance and room safety), and service attitude (e.g., reception service, to treat lodgers with voice of the customers). Its lodgers all felt Homestay A performed great in most of these criteria, but not in service attitude (e.g., reception service, to treat lodgers with voice of the customers), whose weight rank is 5, but performance is 7. The performance in room tidiness also is not bad, whose weight rank is 7 and performance is 5. The top five key criteria of Homestay B's customer group are safety (e.g., lodger insurance and room safety), service attitude (e.g., reception service, to treat lodgers with voice of the customers), room coziness, pick-up service (offering free pick-up service), and catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients). Its customers deemed Homestay B performed greatly in most of these criteria, but not in pick-up service (offering free pick-up service), whose weight rank is 4 but performance is 7. In addition, the criterion of utilizing natural ventilation sufficiently was doing well, whose weight rank is 7 and performance is 5. To summarize, both homestays performed outstandingly in utilizing natural ventilation sufficiently, room coziness, and safety (e.g., lodger insurance and room safety).

With regard to homestay overall performance, five customers felt highly satisfactory with Homestay A, 25 customers considered satisfactory, 14 were slightly satisfactory, and 5 are slightly unsatisfactory. For Homestay B, 7 customers felt highly satisfactory, 18 thought it was a satisfactory experience, and 3 were slightly satisfactory. To conclude, the overall performance of both homestays met the expectation of their customer groups.

5.2. Suggestion

Regarding aspects, both homestays and their customer groups attach greater importance to surroundings of the building and features, service quality, as well as homestay operation and management, but not to the homestay facilities and homestay geist and community co-prosperity, which is consistent with the real situation in Taiwan. Homestay operation in Taiwan is working toward a specialized model. Homestays tend to attract people with their magnificent structures and gorgeous settings, among which some even spent hundreds of millions to set up the facilities. Nevertheless, expert group suggested that is working against homestay's natures and geist. Homestay should be a sideline business, and the interaction between hosts and lodgers should be very tight, but not merely about lodging. On this ground, this study suggest it should start from educating consumers in order to make them understand what homestays are and what they should value is not merely about the exterior condition. Moreover, the interaction between homestay hosts and lodgers should be built up, such as taking the lodgers to have an in-depth travel in order to give a great impression to the customers and they would have a wanna-come-again idea. On top of those, government could work with local communities to form "homestay villages," which would be helpful for driving local economic development. Smangus tribe and Tao-Mi Eco Village, for instance, are both very successful examples of building homestay community in Taiwan.

Regarding customer groups' criteria importance rank and their lodging homestay's performance, the top five key criteria of Homestays A's customer group are room coziness, to utilize plenty natural light, to utilize natural ventilation sufficiently, safety (e.g., lodger insurance and room safety), and service attitude (e.g., reception service, to treat lodgers with voice of the customers). The leading four performance rank of Homestay A is consistent with its importance rank, but service attitude (e.g., reception service, to treat lodgers with voice of the customers) is not performing very well, whose weight rank is 5, but performance is 7. This study therefore suggests Homestay A can improve its service skills by on-the-job trainings or special courses. In addition, its pick-up service (offering free pick-up service) also did not perform well, whose weight rank is 6 and performance is 14. This study deems that it is because Homestay A does not offer this service, but its customer group apparently attaches great importance to it. Therefore, it is suggested that Homestay A could buy a shuttle bus or outsource this service to offer this service and improve the satisfaction. The customer group of Homestay B values safety (e.g., lodger insurance and room safety) most, and Homestay B performs best in this criterion as well. It also performs great in other key criteria, such as service attitude (e.g., reception service, to treat lodgers with voice of the customers), whose weight rank is 2 and performance is 3, and room coziness, whose weight rank is 3 and performance is 2, and catering service and quality (e.g., the hosts prepare diversified breakfast in person, freshness of ingredients), whose weigh rank is 5 and performance is 4. But Homestay B did not perform well in pick-up service (offering free pick-up service), whose weight rank is 4 and performance is 7. This study believes the main cause is same as Homestay A, which does not have this service; therefore, the improving measure is as forementioned. To conclude, the overall performance of both homestays is satisfactory;

Table 19

No.	Date	Expert opinions	Response and actions
(1)	2011/10/27	Both Expert A and C thought the aspects and criteria in the preliminary framework are appropriate. It should not stress the exterior settings and facilities, but the homestay geist and natures in order to make the framework more distributive and comprehensive. On top of those, it should underline the connection between homestays and local communities. At the end, Expert A indicated that aspects and criteria with similar implications could be merged.	(1) This study has integrated and altered the aspects and criteria with similar implication as shown in Table 2. (2) A new aspect was added and was named "Homestay geist and community co-prosperity", in which there are five criteria: "interaction between hosts and guests", "guiding service", "arranging local experiential activities and food", "contribution for living quality of local community" and "initiating preserving actions toward local resources"
(2)	2011/11/17	Expert B pointed out that hardware of homestays are not on par with the one of hotels. Therefore, they should rely heavily on their natures and geist as well as the interaction with guests, and he also suggested underlining a marketing concept of "homestay village." At the end, the expert considered the framework after integrating and altering is appropriate, but if a new criterion of "promoting and preserving local cultural resources" is added under the aspect of homestay geist and community co-prosperity, it would be more comprehensive.	(1) A new criteria of "promoting and preserving local cultural resources" was added into the aspect of homestay geist and community co-prosperity
(3)	2011/11/24	(1) This research was carried out by emails to ask Expert A about the applicability of the after-integrate framework. He reckoned it is distributive and comprehensive. (2) Expert C thought some remarks should be included in each of the four criteria of the aspect of service quality. In addition, she suggested adding "employee" and "outdoor facilities" as new evaluation criteria.	(1) This research has added remarks to the criteria under the service quality aspect as demonstrated in Table 2. (2) Expert A and this research both deemed that the rooms of homestays are limited to 5 to 15 and homestay should be a sideline business; therefore, having employees is not an essential option. As a result, it would not be included in the framework. (3) Expert A and this research both deemed that homestay is a sideline business and its nature is that only if there are surplus rooms, it would become a homestay. Therefore, having outdoor facilities is not an essential option, which was not going to be included in the framework.

however, if they can improve the criteria that did not have good performance, they would be able to achieve the level of highly satisfactory.

5.3. Contribution

Researches on homestays most were about the customer satisfaction [13–15], marketing strategies [16–18], experiential marketing [19–21], operation management [22–26], or consumer behaviors [27–30], but few constructed the evaluation frameworks from perspectives of the entire homestay business operation. Moreover, the functions, operation models, and natures of homestays are different from hotels [3, 12, 32–34]; therefore, if the evaluation standards for hotels are applied to homestays, it would be incompatible and at variance. On these grounds, this research has been carried out through literature review and interviewing experts in order to develop and construct a set of evaluation indicators applicable to homestay business and to draw up an evaluation framework, which would be more comprehensive and tailor-made for the real practice. The expert group pointed out in the interviewing process that aspects like hardware facilities, service quality, and exterior settings are essential to the current demand, but they all stressed that the evaluation should be brought back to the natures and geist of homestay business, such as the interaction between homestay hosts and lodgers instead of only pursuing the exterior setting relentlessly. Based on this ground, the value of this study and the evaluation frameworks' differences between this study and the earlier ones [12, 31, 34, 35] are to add the criterion of homestay geist and community co-prosperity and to make a further discussion. At the end, it is hoped that the results of this study could be a reference for homestay proprietors to improve their business and for government to promote the homestay business in the future.

5.4. Limitation and Future Research

This research only discussed the homestays in Hsinchu region. It is suggested that the scope of future researches can be expanded. Furthermore, this research focused on the features like landscapes, ecology, and building. Homestays with other features can be explored in the future, such as hot spring homestays.

Appendix

See Table 19.

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