

Are lodging really go green? Empirical investigation of the sustainability practice from the hoteliers by IPA analysis.

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Abstract: This study aims to examine hoteliers' perceived importance and performance of green hotel seal criterion factors in the Taiwan hotel industry by using an Importance-Performance Analysis (IPA). Empirical data obtained from hoteliers can identify attributes that hoteliers consider as important but performance as unsatisfactory. The IPA grids illustrated that our results reveal the sustainability activities that hoteliers rated as highly important and performed well are related to water and energy conservation saving, reduce waste, and refrain from providing single-use type bathroom supplies. The value factor fell into the Concentrate Here quadrant; such as establish annual baseline metrics of its energy, water, single-use product consumption, and waste material disposal, participate in related community activities and customer feedback improvement. These items within quadrant II labeled as "concentrate here" imply that hoteliers in Taiwan should focus more resources on improving their performance in the development of green hotel as neglecting these items could threaten the long-term development of green hotel. Implications for Taiwan hoteliers and researchers were discussed.

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1. Introduction

Tourism is known as a 'non-chimney' industry (i.e., one that has a low environmental impact) that is generally recognized to provide significant opportunities for employment and foreign income to the host country. Although tourism provides many business opportunities for local companies, however, it also brings an impact on the natural environment. This can take the form of greater consumption of water, energy, and raw materials, as well as increased emission of greenhouse gases (e.g., carbon dioxide) and generation of waste. In the increasingly environmentally conscious marketplace, consumers have realized the effect of their purchasing behaviors, which are strongly associated with environmental problems (Laroche et al., 2001). The trend also affects the hospitality industry in the form of greater consumption of water, energy, and raw materials, and the increased emission of greenhouse gases (carbon dioxide), and the generation of waste.

The heavy consumption of the environment during their production, operation, and disposal, the provision of such services often relies on the natural vibrancy of the surrounding area within the hotel industry in particular has caused the depletion of natural resource and concomitant problem of increased disposal of solid wastes in landfills. As this view, we contend that the hospitality industry can no

longer ignore its environmental responsibilities. The trend and awareness of sustainability and pro-environmental issues are driving many businesses to adopt green marketing practices through development of new services and products. This phenomenon is not new but has become fairly significant within the hotel industry. Laroche et al. (2001) pointed that the consumers have realized the effect of their purchasing behaviors, which are strongly associated with environmental problems. In the increasingly environmentally conscious marketplace, we can not omit the problems from that hotel industry in the form of greater consumption of water, energy, and raw materials, and the increased emission of greenhouse gases (carbon dioxide), and the generation of waste. As a result, the development of so-called green hotels has become one of the more important recent innovations in the tourist sector.

Why a green hotel? Why should hotels care about the environment? Green hotel is not only good for the environment and community but is also beneficial to hotels too, as it is able to save cost, improve productivity and competitiveness, and attract more guests. Green hotels may be distinguished from ordinary hotels in that they use products and services that minimize water and energy consumption, and reduce solid waste output to protect the environment from further depletion of its natural resources (GHA,

2010). Green hotels have gained increasing prominence over the past 15 years, with more mature markets such as those of the United States and Canada having published rating systems specifically aimed at this emerging sector of the tourist industry. For instance, the United States implemented its “Green Seal Hotel Plan” in 1995, and Canada introduced its “Green Leaf Eco-Rating Program” in 1998. Many potential benefits may be derived from being a green hotel, such as improving efficiency, saving cost, improving market position, improving relationships with stakeholders, and providing wider benefits for the destination. Green hotels have provided the tourism industry with a system that can coexist in harmony with the environment. Green hotels in Taiwan are at a comparatively early stage of development. In fact, until now only a few hotels in Taiwan are awarded “Green Hotel”. There is still plenty of room for improvement.

Some studies have approached the prediction of specific social consumer behaviors from a reasoned action approach. Contexts for using reasoned action approaches have included green consumerism (Minton & Rose, 1997; Spencer, 2010; Sparks & Shepherd, 1992). Previous studies on this topic have focused on describing (1) the management of environmental practices in green hotels (Hung & Lai, 2006; Shen & Wan, 2001); (2) the reasons visitors choose to stay in green hotels (Manaktola & Jauhari, 2007; Yeh et al., 2003); and (3) the green practices that visitors seek when choosing between green hotels (Chan & Ho, 2006; Kung & Tseng, 2004; Park, 2009). However, previous authors have paid little attention to the hoteliers’ viewpoint who been considered play the prominent role to promote the green hotel industry.

The hotel industry is one of the pillars of Taiwan’s tourism and entertainment sector. Being one of Taiwan’s most important business sectors, hotel owners and top management are in a unique position to help to protect our environment. In fact, the concept and principles of “Green Hotels” have been widely incorporated into hotel operation in many parts of the world. Many of these hotels, on adopting environmental friendly measures, have experienced cost savings from waste as well as increased visitor rates due to enhanced customer satisfaction and loyalty. As hotel patrons are gradually demanding of green alternatives, hoteliers are becoming increasingly motivated and willing to take practical steps towards greater environmental responsibility (Bohdanowicz et al., 2011; Manakotola & Jauhari, 2007). Developing green hotel industry in Taiwan is therefore conducive in enhancing the industry’s market competitiveness. Hotel industry itself is the privileged actor to minimize

environmental cost while generating profits. In order to promote these win-win solutions, the Environmental Protection Administration Executive Yuan has been proactively launching a series of activities, such as “Green Hotel Competition” and “Seal of Green Hotel” to encourage the hotel industry to implement environmentally friendly practices. Although we know the importance and benefits of green hotel, we still need to know the value, the performance of these environmental practices and the feasibility of the green hotel certification’s indicators as perceived by hoteliers.

The use of empirical data from surveys of hoteliers is important to the effective management of green hotel execution. Empirical data obtained from hoteliers can identify attributes that hoteliers consider as important but performance as unsatisfactory. This information can be used by management, to manage hoteliers’ expectations or for green hotel seal criterion quality improvement leading to higher overall green hotel industry. Importance-Performance Analysis (IPA) is a technique that has been successfully employed to identify attributes that contribute to low satisfaction by directly measuring, summarizing and interpreting the importance and performance of multiple attributes simultaneously.

The main aim of the hoteliers’ investigation is to identify a set of green hotel seal checklist criterion that hoteliers can employ in their decision-making which will help them to reach their green hotel goal. Further, these indicators are rated in terms of their importance of implementing an appropriate action agenda to promote sustainability. Lastly, appropriate action agenda will be identified for hotel to act so that it may facilitates the achievement of the sustainability in their hotel operations. In the process, strategic areas where hoteliers in Taiwan should concentrate their strategies will be identified in order to sustain their business operations while highlighting areas of low priority.

2. Literature Review

2.1 Green Hotel

What is Green Hotels? Tourism Council Australia (1998) defined green hotels as “depends on the nature of tourism accommodation facilities to adopt environmentally low-impact way to develop business and maintain its business environment, to provide customers with green products, green services and a bionic have benefits to health, living environment clean and comfortable travel, so that visitors get to enjoy nature during their stay, the conservation of nature through qualifications and education”.

From GHA’s website (2010), a green hotel is an environmental friendly lodging property that institutes and follows ecologically programs/practices,

e.g., saving in water and energy, reduction of solid waste and saving cost. In the lodging industry, to provide better service, lodging operations have been supplying free guest room supplies, like personal toiletries, paper slippers, etc., resulted in producing excessive waste and caused enormous damage to environment. As tourism development and operations have become ecologically conscious, adopting green practices becomes a trend for globe development. Thus, marketers in lodging industry have changed their conservative attitude to proactive behavior in following green practices. Furthermore, hotels worldwide are beginning to develop environmental concepts and consciousness, move towards green operations, and comply with environmental requirements and self-management, to become green hotels that follow ecologically sound programs/practices and treat them as their company culture. Some researchers believed that green hotel businesses will become a growing niche in the current competitive lodging industry (Manaktola & Jauhari, 2007).

According to definitions and implication of green hotels addressed above, it is known that in green hotels, hotel managers are eager to engage in green practices and share common philosophies of going green. This can be seen in terms of hotel operations so that tangible and intangible facilities are managed to ensure natural energy and resources are utilized more efficiently, to provide green products and services to hotel guests, to reduce water and energy waste so as to protect the earth from environmental damage and impact, and to establish natural and healthy living environment and friendly hotels. Thus, to maintain service quality in a sustainable environment, a better understanding of visitors' recognition and acceptability with regards to green hotel is fast becoming an important issue.

Another benefit of green hotel is that environmental practices can substantially decrease the operating cost. In the study of DeLollis (2007), the Marriott located in College Park is found to be a clear evidence of this as the hotel "uses 30% less electricity than a comparable property". In other word, the fact that College Park Marriott can save 30 percent of its energy bills means that it is able to yield a higher return per customer than their competitors who charge similar rates and do not have energy saving techniques in place.

To encourage the hoteliers to reduce the environmental impact of its operations, to reduce operating costs effectively, to create market segmentation and to be a leader in the international sustainability trend, the Environmental Protection Administration R.O.C. initiative established the "Green Hotel Seal" in December 2008. The "Green

Hotel Seal" is divided into three rating system: Gold, Silver and Bronze is awarded depending on how extensive a hotel has implemented its environmental programs or practices as listed in the Green Seal Certification Checklist criterion of Taiwan. The green hotel seal checklist criterion comprises: hotel green management, energy conservation savings, water conservation savings, green procurement, disposable product and waste reduction, hazardous substance and pest control, recycling and pollution prevention, and waste water management. Since December 2008, only two hotels received the "Green Hotel Seal", namely Hotel Royal Chihpen and Hotel Color. Compared to other European and Asian countries, the development of green hotel in Taiwan seems too slow.

2.2 Importance-Performance Analysis (IPA)

IPA is a technique for prioritizing attributes for improvement based on evaluation of the importance of the attribute and performance in each attribute which was introduced by Martilla and James (1997). Cvelbar and Dwyer (2012) assert that IPA is a highly appropriate tool for sustainability analysis since it can be used to identify improvement opportunities as well as to guide strategic planning efforts for the hospitality industry. It is a matrix that plotted to represent the importance and performance pairs for each quality attribute. The horizontal axis shows the degree of performance and the vertical axis shows the degree of importance. By using a central tendency (i.e. mean), the importance and performance of each attribute is ordered and classified into high/low categories; after which these two sets of ranking are paired, and each attribute placed in one of the four quadrants (Kuo et al., 2012). This kind of analysis approach has primarily been applied to researches of hotel and resort management and marketing instrument, for example, in some studies of guided tours and destination competitiveness (Huang, 2010; Pritchard & Havitz, 2006; Coghlan, 2012, Taplin, 2012). IPA studies of protected-area visitor satisfaction were focused on visitor services and accommodation (Wade & Eagles, 2003).

The importance-performance analysis that is the technique for prioritizing attributes for improvement based on user evaluation of the importance of each product/service attribute and provider performance in each attribute (Sampson & Showalter, 1999). Here we investigate the importance and the hotels' performance of different attributes to overall hoteliers' perspectives of the green hotel certification's indicators from the Environmental Protection Administration Executive Yuan, Taiwan. The IPA technique identifies areas of perceived high or low attribute performance combined with high or low attribute importance; after which these two sets

of rankings are paired, and each attribute is placed in one of the four quadrants (Figure 1). Attributes in Quadrant I (“keep up the good work”) are performing well but need continued investment (Coghlan, 2012) as this quadrant represents high importance and high performance. Attributes in Quadrant II (“concentrates here”) requires additional investment as they are underperforming. This quadrant represents high importance and low performance, and hoteliers and relevant government department should concentrate their resources on improving attributes in this quadrant. Quadrant III (“low priority”) represents low importance and low performance, thus attributes there require little investment. Quadrant IV (“possible overkill”) is at risk of overinvestment that attributes found there represent low importance and high performance. These IPA data will provide the hotel industry and relevance government department with guidelines to improve the green hotel development.

High Low Importance	Concentrate here II	Keep up the good work I
	Low priority III	Possible overkill IV
	Low	High
	Performance	

Figure 1: Importance-performance matrix (Martilla & James, 1977).

3. Research Method

3.1 Sample Design and Data Collection

This study utilized the survey method to collect data that uses a self-administered questionnaire to collect data regarding hoteliers’ perceptions towards evaluation of the green hotel certification’s indicators. The survey instrument consists of three major parts. The techniques of IPA will be employed to analyze the data in this study.

There are 634 hotels in Taipei city and New Taipei city (refer to the statistics of January, 2013 of Tourism Bureau, M.O.T.C., Republic of China). Therefore, we will use these 634 hoteliers to be the samples in our study. The hoteliers’ questionnaire quantitative data for this study were gathered from hoteliers in Taipei city and New Taipei city. We selected the samples from members of the Taipei and New Taipei City Hotel Association. Sampling time was from 1st January 2013 to 30th April. A total of 616 questionnaires were mail surveys and 212 were returned. A further 48 of the returned questionnaires were incomplete, and thus 164 usable responses were received from hoteliers.

3.2 Measurement instruments

In the questionnaire for hoteliers’ perspectives towards green hotel, we adopted the green hotel certification’s indicators from the Environmental Protection Administration Executive Yuan, Taiwan. The questionnaire includes three sections: the importance of the green hotel certification’s indicators, performance of these indicators and the basic information of the respondents (Hoteliers). The questionnaire of the green hotel certification’s indicators consists: hotel green management (12 items), energy conservation saving (13 items), water conservation saving (6 items), green procurement (3 items), single-use disposable and toiletries and waste reduction (4 items), hazardous substance and pest control (4 items), recycling and pollution prevention (4 items), and waste water management (3 items).

The finalized questionnaire was developed in Mandarin. The content validity was established by introducing the experts’ reviews. Two hoteliers, one faculty member from the Chinese Language Department and three faculty members of the Hotel and Restaurant Administration Department at the Taipei Chengshih University of Science & Technology (TPCU) were approached to comment on the content and wording of the questionnaire. Taking their comments into consideration, their feedback was incorporated in the design of the pilot study.

4. Results and Analysis

4.1 Results of the IPA Analysis of Hoteliers toward Green Hotel Seal Checklist Criteria

The findings of this study are described in three sections. The first section presents the results and a brief discussion of the hotel background. The second section examines the green hotel certification’s indicators in terms of importance and performance from the perspective of the hoteliers. Furthermore, it also checks for gap(s) that exist between importance and performance level of the green hotel certification’s indicators from the perspective of hoteliers. Last section investigates whether the green hotel certification’s indicators work differently based on the demographic characteristics of hoteliers.

4.2 Demographic of the hoteliers

Among 212 responses received, 48 responses were deleted for excessive missing data. Thus, a total of 164 responses were used for data analysis. Detailed sample characteristics are shown in Table 1. Most of the hotels were business hotels (n=162, 98.8%). In terms of the time of establishment, 109 subjects have been in operation for 6–10 years (66.5%). In terms of hotel size, 124 subjects (78.7%) have 51-100 rooms. These 124 respondents indicated that their average price of room were between TWD2,001 to 3,000 per night. 108 hoteliers indicate

that they have every intention (very willing) of getting the green hotel seal in the future.

Table 1: Frequency and percentage of the hotels' background.

Variable		Frequency	Percent(%)
Hotel type	Business hotel	162	98.8
	General tourism hotel	1	0.6
	International tourism hotel	1	0.6
Established time	Under 5 years	13	7.9
	6-10 years	109	66.5
	11-15 years	13	7.9
	16-20 years	12	7.3
	More than 20 years	17	10.4
Hotel size	Under 50 rooms	31	18.9
	51-100 rooms	129	78.7
	101-150 rooms	4	2.4
	151-200rooms	0	0
	Above 250 rooms	0	0
Average price/per room(NT.)	≤ 2,000 NT	20	12.2
	2,001-3,000 NT	124	75.6
	3,001-4,000 NT	16	9.8
	≥ 4,001 NT	4	2.4
Intention to apply green hotel seal	Very willing	108	65.9
	Willing	25	15.2
	No comment	10	6.1
	No willing	16	9.8
	Very no willing	5	3.0

4.3 Analysis of attributes score of importance, and performance of green hotel seal checklist criterion to hoteliers

Table 2 summarizes Cronbach's α values of each construct. Cronbach's α of each item for importance were between 0.863 and 0.958. For performance, Cronbach's α of each item were between 0.774 and 0.925. Cronbach's α for all these constructs were above the threshold level of .70 recommended by Nunnally (1978).

Table 2: Construct reliability toward the green hotel checklist criterion to hoteliers.

Constructs	N of Items	Cronbach's α	
		Importance	Performance
Hotel green management	12	0.956	0.911
Energy conservation saves	13	0.958	0.925
Water conservation saving	6	0.904	0.831
Green procurement	3	0.864	0.856
Disposable product and waste reduction	6	0.905	0.841
Hazardous substance and pest control	4	0.863	0.774
Recycling and pollution prevent	4	0.874	0.806
Waste and water management	3	0.887	0.824

From the initial analysis of IPA, the mean scores of green attributes were calculated. Forty-six items of importance measure and eleven items of performance measure had mean scores greater than "4". This indicated that the hoteliers perceive GRA practices to be at least "important" and "fair" performance. The mean scores for the attributes of green practices in importance measure ranged lowest from 3.80 (GM2, the property shall have in place environmental policies and environmental compliance programs (or

action plan)) to highest at 4.39 (EC2, the property shall install programmable on/off timers and/or sensors to the ventilation equipment used in its underground car park). Similarly, in performance measure, EC2 with a mean of 4.16 was rated highest while WC6 (Wastewater from swimming pools and public baths shall be treated separately from wastewater of other sources. Wastewater shall go through hair and suspended solids filtration treatments before being used for other purposes) had

the lowest mean score with 3.64. Table 3 presents the attributes of green hotel seal checklist criterions in mean scores and standard deviations of the 51 terms of importance and performance.

Table 3: Importance and performance ratings of green seal checklist criterion to hoteliers.

Item	Label	Attribute description	Importance Mean (St.Dev)	Performance Mean (St.Dev)
Hotel green management				
1	GM1	The property shall not have violated any applicable environmental regulations nor subjected to any fines/penalties by the environmental authorities, in the past 12 months before its application.	4.34 (0.910)	4.12 (0.856)
2	GM2	The property shall have in place environmental policies and environmental compliance programs (or action plan).	3.80 (0.785)	3.77 (0.697)
3	GM3	The property shall establish annual baseline metrics of its energy, water, single-use product consumption, and waste material disposal so that environmental management audit can be done to ensure minimum compliance is met.	4.21 (0.938)	3.80 (0.792)
4	GM4	The property shall have environmental education training programs for its staff and evidence of their implementations.	4.08 (0.893)	3.87 (0.756)
5	GM5	Administrative areas of the property shall promote related environmental protective measures by referencing the Environmental Protection Administration's 'Protecting the Environment in the Office DIY' and 'Protecting the Environment in the Office Manual'.	4.04 (0.936)	3.79 (0.755)
6	GM6	The property shall proactively maintain the sanitation and cleanliness of its surrounding area.	4.09 (0.882)	3.99 (0.821)
7	GM7	Restaurant(s) managed by the property shall not purchase endangered species as ingredients.	4.07 (0.887)	3.95 (0.758)
8	GM8	The indoor air quality of the property shall comply with the indoor air quality standards dictated by the environmental authorities. The property shall also implement routine maintenance and checks on the related facilities.	4.13 (0.908)	3.90 (0.833)
9	GM9	The property shall participate in related community activities or find ways to give back to the community.	4.13 (0.897)	3.89 (0.783)
10	GM10	The property shall set up customer feedback gathering and improvement procedures.	4.12 (0.916)	3.88 (0.771)
11	GM11	Restaurant(s) managed by the property shall give priority to locally and/or organically grown produce and not use inedible decorative ingredient.	4.13 (0.937)	3.98 (0.843)
12	GM12	The property shall participate in the "Walk-Sing Green Life Program" organized by the Environmental Protection Administration.	4.17 (0.890)	3.98 (0.810)
Energy conservation saving				
13	EC1	The property shall conduct annual checks and preventive maintenance on its heating, ventilation, and air conditioning (HVAC) equipment.	4.14 (0.843)	4.01 (0.755)
14	EC2	The property shall install programmable on/off timers and/or sensors to the ventilation equipment used in its underground car park.	4.39 (0.956)	4.16 (0.831)
15	EC3	Ventilation fans and lightings of bathrooms within the property shall be linked.	3.90 (0.823)	3.84 (0.700)
16	EC4	The property shall minimize the operations of escalators and elevators during low usage period.	4.16 (0.952)	3.91 (0.817)
17	EC5	All large-scale air conditioning systems, hot water boilers and heated swimming pools shall be installed with heat recovery or heat reuse devices.	3.95 (0.915)	3.89 (0.799)
18	EC6	When seeking environmental accreditation, the property shall install systems or equipment to ensure lightings remain off when area is unoccupied.	4.12 (0.909)	3.91 (0.813)
19	EC7	Freezers of restaurant(s) managed by the property shall have plastic or air curtains.	4.14 (0.843)	3.96 (0.801)
20	EC8	Outdoor lightings of the property shall be installed with timers or light sensors.	4.09 (0.923)	3.98 (0.775)
21	EC9	The property shall establish procedures to reset air conditionings and heaters to their default settings.	4.02 (0.933)	3.99 (0.787)
22	EC10	More than half of the indoor lighting within the property shall be energy-efficient lighting appliances.	4.12 (0.898)	3.96 (0.801)
23	EC11	More than half of the exit and emergency lighting within the property shall be cold cathodes or light-emitting diodes.	4.03 (0.903)	3.93 (0.807)
24	EC12	Power supply to guestrooms and their door cards (keys) shall be linked so that power can be switched off when guests leave their rooms.	4.03 (0.956)	3.92 (0.791)
25	EC13	Guests shall be discouraged from driving to the property. The property shall provide alternative transport arrangements, such as providing shuttle bus services from fixed locations to the property.	4.12 (0.9430)	3.95 (0.777)
Water conservation saving				
26	WC1	The property shall conduct maintenance and checks every 6 months on its water and plumbing fixtures.	4.08 (0.900)	3.98 (0.798)
27	WC2	The property shall provide notice cards or other means to allow guests to choose between changing towel and linen every day or once every few days.	4.15 (0.902)	3.99 (0.783)
28	WC3	The property shall place cards and brochures in strategic locations within its bathrooms or guestrooms to promote energy and water saving.	4.15 (0.895)	3.99 (0.751)
29	WC4	More than half of faucets and showerheads within the property shall be compliant with the water saving standards.	4.05 (0.867)	4.03 (0.802)

30	WC5	More than half of the toilets within the property shall be environmental or water saving equipment or facilities.	4.10 (0.924)	3.93 (0.788)
31	WC6	Wastewater from swimming pools and public baths shall be treated separately from wastewater of other sources. Wastewater shall go through hair and suspended solids filtration treatments before being used for other purposes.	4.01 (0.956)	3.64 (0.892)
Green procurement				
32	GP1	The property shall promote environmentally friendly products in its shops.	4.09 (0.909)	3.90 (0.881)
33	GP2	The property shall give priority to environmentally friendly products while purchasing office supplies, office consumables, and detergents	4.09 (0.926)	3.91 (0.871)
34	GP3	Purchases of at least 5 types of environmentally friendly products shall exceed 50% of their individual total.	4.04 (0.913)	3.92 (0.865)
Disposable product and waste reduction				
35	DP1	The property shall avoid providing single-use type bathroom supplies.	4.12 (0.936)	4.00 (0.844)
36	DP2	The property shall not provide disposable food service items.	4.23 (1.072)	4.12 (0.909)
37	DP3	The property shall rally guests to its environmental cause by informing them of the devastating impact single-use products have on the environment.	3.84 (0.846)	3.70 (0.695)
38	DP4	Restaurant(s) managed by the property shall not use single-use tablecloths.	4.04 (0.959)	3.81 (0.826)
39	DP5	When seeking environmental accreditation, restaurant(s) managed by the property shall provide reusable towels or napkins.	4.00 (0.933)	3.92 (0.821)
40	DP6	The property shall not provide disposable cutlery.	4.07 (0.904)	3.87 (0.825)
Hazardous substance and Pest control				
41	HS1	The property shall have proper recycling procedures for discarded batteries and lighting products. Procedures shall contain evidence of tracking obtained from waste and recycling service providers.	4.05 (0.942)	3.96 (0.809)
42	HS2	The property shall use sanitation agents and insecticides that are compliant with environmental regulations.	4.10 (0.944)	3.98 (0.832)
43	HS3	When seeking environmental accreditation, dry cleaning facilities within the property shall not use halogen solvents as cleaning agents.	3.94 (0.905)	3.95 (0.793)
44	HS4	The property shall conduct regular checks on its water-cooled air conditioning systems (WACS) for legionella bacteria.	4.04 (0.955)	3.88 (0.871)
Recycling and pollution prevention				
45	RP1	The property shall implement garbage classification and resource recovery.	4.14 (0.965)	4.02 (0.854)
46	RP2	The property shall implement kitchen waste recycling and reuse measures.	4.02 (0.933)	4.02 (0.832)
47	RP3	When seeking environmental accreditation, the property shall not purchase over-packaged products, ingredients, and consumables so as to minimize waste.	4.12 (0.962)	3.98 (0.814)
48	RP4	The property shall use grease traps and oil strainers to filter kitchen wastewater.	4.09 (0.929)	3.96 (0.882)
Waste and water management				
49	WW1	When seeking environmental accreditation, restaurant(s) managed by the property shall be equipped with dishwashing equipment that is compliant with the rules and regulations of the health authorities.	4.16 (0.935)	4.09 (0.832)
50	WW2	The property shall discharge wastewater into the public sewage system or set up proper treatment facilities and conduct regular cleaning of sludge.	4.15 (0.924)	4.05 (0.813)
51	WW3	Restaurant(s) managed by the property shall install greasy fume control and deodorant equipment for their extractor hoods and shall ensure that the noise created comply with environmental regulations.	4.18 (0.955)	4.10 (0.819)
Grand Mean			4.088	3.941

*Importance variables measured on a 5-point scale ranging from unimportant to extremely important

*Performance variables measured on a 5-point scale ranging from poor to excellent.

Table 4: Results of Paired t-tests.

Factor	Mean		Important-Performance	t	df	Sig. (2-tailed)	95% Confidence Interval	
	I	P					Lower	Upper
GM	4.11	3.91	0.2	5.289	163	.000	0.125	0.274
EC	4.09	3.95	0.14	3.665	163	.000	0.061	0.204
WC	4.09	3.92	0.17	4.055	163	.000	0.084	0.245
GP	4.07	3.91	0.16	3.045	163	.003	0.056	0.265
DP	4.05	3.90	0.15	3.697	163	.000	0.069	0.226
HS	4.04	3.94	0.1	2.100	163	.037	0.006	0.183
RP	4.09	3.99	0.1	2.361	163	.019	0.016	0.182
WW	3.13	3.06	0.07	2.068	163	.040	0.003	0.128

IPA Grid

Eighteen items—GM1, GM12, EC1, EC2, EC3, EC9, WC3, WC4, GP1, GP3, DP1, DP6, HS2, RP1, RP4, WW1, WW2, and WW3—were plotted in the quadrant I of “**keep up the good work**”. These green features in quadrant I were not only perceived as important but also well-performed by the hoteliers. Therefore, it is predicted that their performance should be maintained. Nineteen items—GM2, GM3, GM9, GM10, EC6, EC13, WC2, DP3, and DP3—were plotted in the upper left-hand quadrant II which means “**concentrate here**”. Therefore, these three features need to be improved upon in terms of performance by the hoteliers (Figure 2).

Also, fifteen items—GM4, GM5, GM7, GM8, EC4, EC5, EC10, EC11, WC1, WC5, WC6, DP4, DP5, HS4, and RP2—were positioned in the quadrant III of “**low priority**”. These fifteen items were perceived as relatively unimportant by the hoteliers. From the hoteliers’ viewpoint, the hotels may pay less attention on these.

Nineteen items—GM6, GM11, EC7, EC8, EC12, DP2, HS1, HS3, and RP3—were plotted on quadrant IV of “**possible overkill**”. Based on the results, these nineteen items were viewed as unimportant by the hoteliers; yet, the hoteliers performed these features well. According to the results, the hoteliers may limit their attentions on these items (Figure 2).

Importantly, based on IPA, the hoteliers in general perceived that activities related to WW (Waste and water management) were well-performed as all attributes related to WW-WW1, WW2, and WW3 were plotted on the “keep up the good work” quadrant. Also, green hotel seal checklist criterions attributes related to Waste and Water Management were valued more than other green features by the hoteliers. To aid IPA, Figure 3 suggests a line graph to show how the hoteliers perceived green practices in importance and performance.

Evaluation of Green Dimensions

A paired-samples t-test was conducted to evaluate whether there is difference between the level of importance and performance in each green hotel seal checklist criterions dimension as perceived by the hoteliers. Table 4 showed that the mean scores from the importance to the performance were decreased. In other words, the employees assessed that the performance level by hotels did not exceed their importance level regarding green practices.

Based on the difference of the mean scores, the gap on WW (0.07) was approximately one third of GM (0.2); this means that the green activities for GM

did not perform well in comparison to other green activities. This emphasized that there was a statistically significant difference between the level of importance and performance as perceived by the hoteliers; performance level on green practices was lower than importance level regarding green practices. In fact, the Waste and Water Management area had the lowest performance level among the green dimensions. Based on the results of paired t-test, there will be a significant difference between green importance perception and green performance perception –is supported. The results of paired t-test are shown in Table 4.

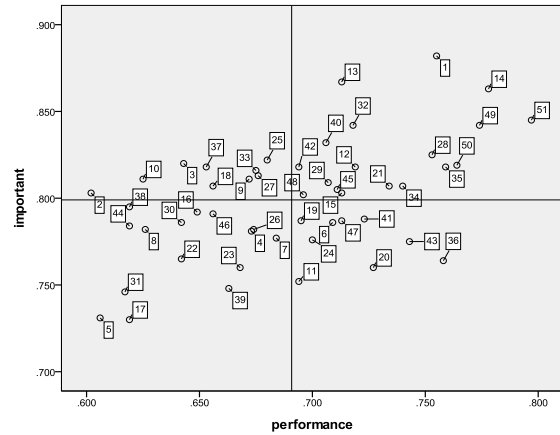


Figure 2: Items of importance-performance analysis grid.

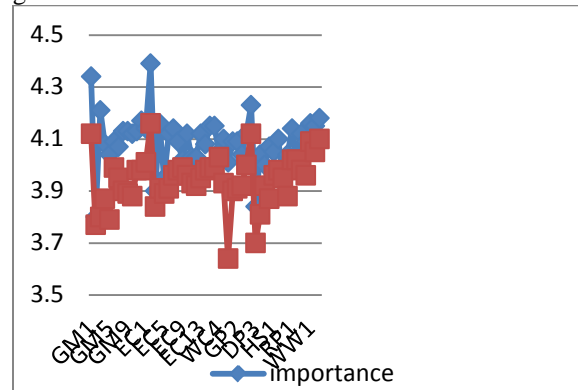


Figure 3: Assessment of each attribute in importance and performance by hoteliers

5. Conclusions and Discussion

Our results reveal the sustainability activities that hoteliers rated as highly important and performed well are related to water and energy conservation saving, reduce waste, and refrain from providing single-use type bathroom supplies. As expected, the results are similar to the previous studies; profit is the most important goal of hotel firm (Dwyer et al, 2011; Mihalic et al., 2011). This explains a better

sustainability performance will contribute to higher overall enterprise efficiency. We might argue that the return on equity for the hotel operation was partly responsible for such a high level of importance being attributed to these economic performance indicators. Surely, the orientation of the profit-making is greatly important and should be one of the primary goals of the hotel business. This echoes the findings of Dwyer and Kemp (2004), without financial gains a firm cannot be sustainable in its operations.

In the IPA analysis of items of green hotel seal checklist criterion, it reveals many items are located in the quadrant II, which means that these items of sustainable operation are rated as highly important but their performance were relatively neglected. Activities such as establish annual baseline metrics of its energy, water, single-use product consumption, and waste material disposal, participate in related community activities and customer feedback improvement, minimize the operations of escalators and elevators during low usage period, install systems to ensure lightings remain off when area is unoccupied, provide alternative transport arrangements, provide notice cards to allow guests not to change towel and linen every day, priority to purchasing environmentally friendly products office supplies, office consumables, and detergents, ally guests to its environmental cause by informing them of the devastating impact single-use products have on the environment. These items within quadrant II labeled as “concentrate here” imply that hoteliers in Taiwan should focus more resources on improving their performance in the development of green hotel as neglecting these items could threaten the long-term development of green hotel.

The management implication of this study lies with the perspectives of hoteliers on green hotels. By understanding hoteliers' views toward green hotels, we are able to propose strategies to promote the development of green hotel in Taiwan. It is hoped that this study will contribute to the sustainable development of the hospitality industry while responding to the global sustainability trend.

From the results of IPA of the green hotel seal checklist criteria indicate the hotel industry should not only focus on sustainable activities aimed at economic profit and operations that regulated by the law but also include activities that promote the development of the sustainability. The findings reveal the hoteliers' lack of understanding of the basic principles of sustainability. They just emphasize the environmental management practices to reduce costs or to avoid punitive sanctions of laws. Taiwan hoteliers seem to be passive role that in an early stage of environmental awareness they only have strong

commitment to economic performance, however, neglecting the pillars of sustainable development.

Based on the results, we will suggest that related government agency take the lead in instituting regulation asking hoteliers to comply with the legislation in the efforts of promoting sustainability operations. These agencies can also devise some incentive strategies to entice hoteliers to implement environmental preservation operations, for example, hotels that conform to the green hotel seal checklist criterion will get the abatement of tax. Different levels of the “Green Hotel Seal” rating (Gold, Silver and Bronze) entitle hoteliers to different grade of tax abatement, with Gold getting the highest tax abatement. Evaluation should be held on a regular time schedule and every hotel should be forced to join the assessment of the green hotel seal checklist criterion. The development of green hotel assessment system should be similar to the hotel star assessment system that is being held every two years. If the hotel is certified by the hotel star system assessment, the hotel will be rewarded with monetary prizes, promotion by Tourism Bureau of Taiwan during travel fair or regular promotional activities, and preferential recommendation for school field trips or government agencies' recreation activities. With these promotional strategies, we think the hotel will be more motives to join the assessment of green hotel seal.

At this stage, government strategies appeared to be the stumbling block in the development of green hotel industry in Taiwan. The awarding of the green hotel seal is the responsibility of Department of Health, Executive Yuan, while the Tourism Bureau oversees the hotel industry. Both belonged to different government machinery. When the Department of Health, Executive Yuan announced the launch of the green hotel seal, they should have done it together with the Tourism Bureau. Both government departments should work together to promote the system of green hotel seal so that the hoteliers would take the development of the green hotel industry seriously. By pooling their resources together and combining all their expertise, we are hopeful that the green hotel industry in Taiwan will soon soar to new heights.

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