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Analysis of luxury resort hotels by using the Fuzzy Analytic Hierarchy Process and the Fuzzy Delphi Method

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'Experience Economy' is an accelerator switching the experience process of consumption into eternal memory, perfecting value and promoting positive after-buying intention. This research uses the Fuzzy Delphi Method (FDM) and Fuzzy Analytic Hierarchy Process (FAHP) to construct a system of evaluation criteria focused on understanding the luxury resort hotels (LRHs) industry in Taiwan and Macao. One finding of this study is that objective hotels in these two territories exhibit different hotel operating characteristic (the unity LRHs mode in Taiwan vs involving casino LRHs in Macao) and customer markets. These Macanese LRHs define them as 'international operations', in contrast the Taiwanese position themselves as 'domestic businesses'. The other finding is that Taiwan based evaluation criteria on 'consumer-orientation' and 'operation and management', while Macao stressed evaluation based on 'operation and management' to manage LRHs industry.

Keywords: luxury; luxury resort hotels (LRH); Fuzzy Delphi Method (FDM); Fuzzy Analytic Hierarchy Process (FAHP)

JEL classification: C22, E31, E37, F64, L22, L25, L83, M00

1. Introduction

Financial forecasts and funds market activity are frequently taken as indicators for future global economic trends; one of the forecasting classifications sees 'luxury goods' as an independent group (2001). The emergence of this newly changing topic is quietly shaping the possibility that suggests a future boom in 'luxury' industries.

The highest building in the world, the *Burj Khalifa* – which has been designed to be the centrepiece of a large-scale, mixed-use development that will include 30,000 homes, nine well-known hotels (such as The Address Downtown Dubai), three hectares (7.4 acres) of parkland, at least 19 residential towers, the Dubai Mall, and the 12-hectare (30-acre) man-made Burj Khalifa Lake – opened in Dubai in 2010, and in 2000 the *Burj Al Arab* opened in the United Arab Emirates boasting it was a 7-star hotel. All Organisation of Petroleum Exporting Countries (OPEC) member states are aware that their energy resources will eventually become depleted, and tourism industry investment or development thus offers an attractive means of achieving sustainable economic growth. Simultaneously, a trend of 'extreme luxury travel experience' suddenly swept the world and numerous famous hotel groups developed plans for building a world-class, one-of-a-kind luxury resorts that competitors would be unable to rival. Every

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hotel operator hopes to provide travellers with unique, personal and valuable consumer self-extension values, obtained through the process of luxury consumption, not from the tangible product function that characterises the luxury product industries (Michael et al., 2003; Nueno and Quelch, 1998; Vigneron and Johnson, 2004). The concept of ownership or possession is irrelevant to luxury consumption, which considers only the concepts of experience, memory or perception (Danziger, 2007; Michael et al., 2003). Such an appeal coincides perfectly with the characteristics of the tourism and travel industry, development of which is driven by service and experience. Therefore, using industry features, consumer consciousness and the brand equity of luxury resort hotels (LRHs) to identify the key success factors or evaluation criteria for defining the LRHs industry is the most important issue in this investigation.

The image of luxury has become increasingly valued in academic research on certain industries. However, to date the definition of 'luxury' either remains literal or is simply interpreted as a surpassing function (Dubois et al., 2001; Kapferer, 1998; Su and Sun, 2007; Vigneron and Johnson, 2004). In fact, luxury is a variable term, and should be interpreted according to different research objects, targets, scopes or features. The question thus arises of how to construct evaluation criteria and measurement items in the LRHs industry. A further question is the key success factors that the evaluation criteria model should cover. Answering this question integrates the concepts of industrial characteristics and key factors from researchers and specialists to establish evaluation criteria for the LRHs industry.

Zhang (2002) described the two-dimensional factor cluster perception map on recreation businesses, where the coordinate graph comprises the four possibilities of entertainment versus recreation and natural versus artificial represents a clear classification of recreation businesses based on their industrial characteristics. In this perception map, leisure resort hotels and casino resort hotels fall on relative coordinates namely natural-creation and artificial-entertainment. After combining the discourse with the regional management features and the circumstance of the Asian LRHs industry, this investigation first takes luxury leisure resort hotels in Taiwan and luxury casino resort hotels in Macao as research objects. The study goals are as follows.

- Construct the hierarchical framework of the evaluation criteria to assess the luxury leisure resort hotel industry in Taiwan and the luxury casino resort hotel industry in Macao.
- Compare the business operating models of the LRHs industry between Taiwan and Macao.

2. Literature review

2.1. Concept and definition of luxury

A paradigm has occurred in the luxury market, with a traditional consumption model based on the display of wealth have transformed to a new experience-based perception of luxury in 1984. This transfer demonstrated that consumers no longer perceive luxury consumption as belonging specifically to members of high society or the aristocracy. Instead, luxurious consumption has gradually evolved into a consumption process accessible to ordinary consumers willing to spend extra – whether in the form of money, time or labour. Luxurious consumption thus has become a manifestation of self-extension, as well as a medium for absorbing experience or learning new knowledge. Luxurious consumption has even become a means of establishing social networks.

'Luxury' is an adjective as well as a noun, but its appreciation necessarily involves verbs – i.e. it is an active process. Experience is one of the main characteristics of luxury consumption. Consumers may merge the entire experience process to influence and transfer their perceptions, and create unique personal thoughts. That is, luxury might be a relative value, an evolving contrast of whole service and experience processes that gradually moulds common concepts. Michael, Neil and John (2003) suggested the 'new luxury' strategy as a new consumer psychology applied in the connotation of surpassed conventional products or objects to reach a new level – psychological contentment achieved through better experiences, deeper meaning, richer enjoyment and longer perception. The needs-hierarchy theory (Maslow, 1954) explains and verifies why consumers buy luxury goods, with one possibility being a desire for self-fulfilment. Consumers imagine how to upgrade their status through the purchase of luxury goods. On the other hand, an imaginary luxury goods experience might result from individual expectations of seeing their 'dream' realised.

The economist Veblen first proposed the concept of luxury in his Law of Demand Theory, which describes luxury as a property displayed outside the normal law of supply and demand and possessed by 'conspicuous goods'. Such goods demonstrate the social status and wealth of their owners. However, individuals define luxury differently. The term 'luxury' is derived from the Latin word 'luxuria', which means 'excess'. Over two millennia, the concept of 'luxury' has gradually lost its hidden negative implications, such as immorality, dissipation, and corruption. Simultaneously, the term has gradually lost its sensory connotations, and became a common descriptor of certain products, industries and physical objects, denoting expensive merchandise that only the rich can afford. The concept of luxury consumption coincides with the desire to achieve satisfaction via 'self-fulfilment' as stated by Maslow (1954) in need-hierarchy theory. Furthermore, Danziger (2007) classified and distinguished 'new luxury' from 'old luxury' in the mid-1980s, with 'new luxury' characterised by pursuing the experience of consuming merchandise and services rather than by mere possession of a product. 'New luxury' denotes a consumer perceived luxury experience, whereas 'old luxury' focuses on status and authority. Luxury is an experience or sensation in the new luxury field, and is related to the manner in which the consumer experiences (verb), rather than the tangible product (noun) in the definition of old luxury.

2.2. Luxury resort hotels' industry

Tourism trends reveal that the Asia Pacific is second only to Europe as the most visited area in the world (World Tourism Organisation [WTO] 2008). The WTO forecasts that tourist numbers will reach 1.602 billion globally in 2020. Meanwhile, competition in the tourism industry will intensify because of the establishment of new tourist resorts and the expansion of related facilities. Consequently, numerous countries are developing new tourist attractions or investing in tourism-related projects, and seeking to combine these with local characteristics and international competitiveness, to attract visitors from to obtain foreign exchange, boost domestic employment, and improve their international reputation.

During the first half of 2007, the LRH industry (including high-end and luxury hotels) made sales of USD11.5 billion (The Leading Hotels of the World Web). And this phenomenon has stimulated interest from numerous consumers, investors, developers and hotel operators, in either investment or related research. Presently, no official or complete definition of 'luxury hotel' is available from the industrial, government and

academic sectors. Moreover, the absence of such a definition might be why the LRH industry remains an immature market whose defining involves numerous complicated aspects, categories and limitations, including service quality, facility planning, employee performance and administration, management, etc. In short, it is difficult to define the concept of LRHs based simply on a few factors or indicators.

An LRH is considered the symbol of a country and thus must be physically attractive or related to certain local scenery. An extravagant atmosphere is created using superb craftsmanship and luxury elements that are imparted into software and hardware services to create an incomparably high quality vacation experience. Some operators boast that their hotels are at 7-star level to present an über-luxury product image. However, definitions and perceptions of luxury remain highly variable. 'Luxury is a term that is frequently used, yet standards of luxury are defined via consumer expectations and experiences' (Kerr, 2005). Additionally, although luxury is related to money, continuous shifts in the nature or spread of wealth make it impossible to establish a numerical standard for measuring luxury. Nonetheless, numerous luxury hotel operators and marketing researchers have observed that luxury is more about the feeling of an experience than the tangible benefits it provides, and luxury represents enjoyment that ordinary consumers can afford and easily obtain. This is a direction that every luxury hotel businesses should seriously consider to ensure they provide suitable services and products.

In the two-dimensional factor cluster perception map for recreation businesses developed by Zhang (2002), the coordinate graph comprised the four aspects of entertainment-recreation and the natural–artificial clearly classifies recreation businesses based on their industrial characteristics. Yao (1997) also classified leisure resort hotels into three types based on their geographic locations: hot spring leisure hotels, seaside leisure hotels, and casino leisure hotels. A comparison of the characteristics of casino leisure resort hotels using the two-dimensional factor cluster perception map of recreation businesses developed by Zhang (2002) demonstrates that leisure resort hotels and casino resort hotels fall into opposing categories (namely natural creation versus artificial entertainment).

Recently, Taiwan has offered numerous expectations for future development following the lifting of restrictions on gambling business. Simultaneously, tourism and travel businesses hope the enactment of the Regulation on Gambling Operations on Offshore Islands can boost the development and diversity of the tourism and leisure industries in Taiwan. Rising gross national product (GNP), economic progress and falling unemployment, in addition to other opportunities for national and social improvement, may result from tourism development. Therefore this study also takes Macao, a region with a tourism industry based on legalised gambling, as a research object. The 'clustering effect' derived from the gambling operations has raised numerous tourism development indicators that numerous Asian countries are learning and copying. The gambling industry in Macao has attracted capital investment from big corporations all over the world and per capita Gross Domestic Product (GDP) of Macao rose to No. 3 in Asia in 2007 (ranking next to Brunei and Singapore, and surpassing Hong Kong and Taiwan). This impressive economic performance has made Macao a star in the Asian region and a worthy model for Taiwan to emulate in its future national economic or tourism development.

This study attempts to combine the concept of 'luxury' with the key success factors presented by the above researchers examining in Taiwan and abroad after conducting an empirical investigation on LRHs, and develops a set of appropriate criteria for defining LRHs using the Fuzzy Delphi Method (FDM) and the Fuzzy Analytic Hierarchy

Process (FAHP) after conducting questionnaire interviews with LRH industry specialists. This study then attempts to consolidate the concept of luxury with the industrial characteristics of LRHs to establish a basic definition of LRHs.

2.3. Key success factors in the luxury resort hotel industry

Today, all countries value the development of the tourism and travel industry and regard these industries and hi-tech industry as the industries with the largest potential to be star industries of the twenty-first century. The WTO hotel classification standards include number of rooms, facilities and equipment, service provided, service quality and employee quality. In the UK, Italy, Greece and Switzerland, evaluation generally focuses on service items, equipment and facilities, location and appearance. The American Automobile Association (AAA) designed a set of hotel evaluation criteria in 1977 and adopted a diamond symbol classification that ranked hotels into five levels. The system has been applied in the US, Canada, Mexico and the Caribbean and covers hotel appearances, room facilities and equipment, public areas, sanitation, management, and service quality. The Institutional Investor Magazine selected 100 senior bankers as judges to assess hotels in different parts of the globe each year. This evaluation method revealed location, architectural style, and equipment, facilities and service quality as the three aspects most valuable to travellers.

Focusing on the hotel service quality evaluation model issued by the Taiwanese Tourism Bureau, Su and Sun (2007) developed and analysed the five aspects on the SERVQUAL scale. The analytical results demonstrate that hotel service evaluation in Taiwan is focused more on indicators based on tangibility and assurance. Regarding reliability, responsiveness and care, they remain insufficient and require improvement. This investigation indicates hotel evaluation system might be based mainly on consumer perspectives when establishing and developing hotel evaluation systems to provide updates and increase system acceptability and reliability.

Although hotel organisations and research from different countries have yet to agree regarding the criteria used for hotel evaluation items or aspects, most have developed evaluation items and indicators dealing with ‘services’, ‘equipment’ and ‘management’. Moreover, since ‘customer orientation’ is very important for the service industry, it is extremely meaningful to the hotel industry, which values interpersonal interactions highly (Saxe and Weitz, 1982). Application of ‘customer-orientation’ in business operations can be crucial in enterprise profitability. This concept is a prerequisite when a company is building its competitiveness but is not included in current hotel evaluation systems (Narver and Slater, 1990; Su and Sun, 2007). Therefore, among the criteria for identifying luxury hotels that this study attempts to establish, service contents, equipment content, management, and customer management provide the four main aspects, and provide the basis for developing related indicators (see Table 1).

2.4. Key success factors for the review of the luxury resort hotels’ industry

Numerous studies have examined the hotel industry in Taiwan and elsewhere. Most of these studies focused on key success factors, management performance, consumer behaviour, human resource management and customer management. The following is a table of ‘Key Evaluation Indicators for Luxury Leisure Hotels’ initially established based on the compilation and investigation of the key factors behind the success of leisure resort hotels.

Table 1. Evaluation concepts of the hotel rating system worldwide.

Evaluation concept nation	Equipment content	Equipment quality	Cleanness and maintains status	Service content	Service quality	Operation and management
World Tourism Organisation (WTO)	★	★		★	★	★
Public institutional investors	★	★		★	★	
American Automobile Association (AAA)	★	★	★	★	★	★
American MOBIL	★	★	★	★	★	★
Automobile Association (AA)	★	★		★		
ETB	★	★		★		
Canada	★	★	★	★	★	★
Australia	★	★	★			
Israel	★	★		★	★	
Germany	★	★		★	★	
China	★	★	★	★	★	★
Taiwan	★	★	★	★	★	★

★ indicates the evaluation concepts.
Source: Author's calculations.

Frederick (2000) observed in his study of *Advantages of Chain Hotel Management* that, for chain hotels, the main evaluate factors are standardisation, management and control. Furthermore, Ernst and Young (1995) studied 74 managers of 27 international leisure hotels in his investigation entitled *Tracking the Critical Success factor for Hotel Companies* and concluded that seven factors lie behind the success of international leisure hotels, including the staff service attitude, customer satisfaction, good equipment, good location, cost control, high market share, and correct market positioning.

Yu (1987) listed nine key success factors for hotel businesses in his study of tourism marketing strategies in Taiwan: services, reputation, physical products, product design, customer sources, business revenue, scale, location, and staff size. Hung and Lin (2012) stated that the key success factors for hotel businesses were service quality, food quality, employee attitude, sanitation, employee appearance, complaint handling and price. Additionally, Yesawich (1988) mentioned in *Marketing in the 1980s* that the following nine items are crucial in successful hotel management: established reputation and brand name, service quality, equipment standards, uniqueness of public facilities, booking convenience, location, international chain of hospitality, effective promotions and customer perceived price/value ratio.

Lee (1993) suggested in his *Study on Key Success Factors in Leisure Resort Center Management* that the primary motivation of consumers staying at leisure resort hotels is seeking relaxation, and they are thus primarily concerned with the diverse facilities and services that can provide a basis for a leisure-focused vacation. In his *Comparative Study on Management Strategies of International Hotels in*

Singapore, Hong Kong and Taiwan, Chen (1993) discovered that hotel operators in these three locations all agreed that key success factors for the hotel industry include service quality, publicity and promotions, location, staff quality, equipment and furnishing, and prices. Xie (1988) adopted regression analysis in his *Study on Factors Affecting Hotel Management Performance in Taiwan* and proposed 11 factors that determine management performance: location, history, room rates, room number, advertising expenses, staff size, affiliated services, discounts offered, number of parking spaces and business capital. The above literature review reveals that no researchers, whether in Taiwan or elsewhere, have made studied LRHs and developed a set of criteria for assessing the industry. This study thus surveyed the literature and established relevant assessment guidelines from the four aspects of 'service content', 'equipment content', 'management' and 'customer orientation' together with the industrial characteristics and concepts of LRHs, as listed in Table 2, to provide an initial construct table listing the criteria for defining the LRHs examined in this study.

3. Methodology

This study uses twice extended expert questionnaires as the basis for forward research analysis. In this case, the targets for the experts who completed the questionnaire provide sufficient knowledge of the tourism field or engagement in the luxury leisure hotel. According to Robbins (1994), the number of participants required for decision-making problems ranges from 5 to 7. The aim of this new approach is to use FDM and FAHP to construct a system of evaluation criteria focused on understanding the LRHs industry in Taiwan and Macao.

3.1. Fuzzy Delphi Method

This study investigates the problem of achieving consensus in group decisions when using FDM and FAHP and uses the following approaches:

(1) This study utilises FDM not only to save money and time, but also to faithfully represent the group views;
(2) It uses FAHP to reverse the programme;
(3) It also adopts a straightforward process of building fuzzy numbers;
(4) This study uses simple procedures to handle multi-level, multi-attribute and multi-programme decision-making problems.
(5) Consequently, this investigation plans to adopt FDM and FAHP as a research methodology.

The fuzzy theory was proposed by Zadeh (1965) at the University of California at Berkeley. Dr Zadeh was of the opinion that the traditional scientific methods often ignored the uncertainty and ambiguous existence of human life, so he set out to use fuzzy set theory and adopted the fuzzy logical concepts to process. Later, Buckley (1985) incorporated the fuzzy set theory into the traditional AHP. FAHP thus became a suitable tool for solving real-world multi-criteria decision-making (MCDM) problems (Buyukozkan, 2004; Fu et al., 2011; Huang and Wu, 2005; Lin et al., 2009; Sipahi and Timor, 2010). It has been combined with the FDM by many scholars in the fields of service and tourism (Chen and Wang, 2010; Cho and Lee, 2013; Wang and Durugbo, 2013).

Table 2. Primary concept arrangement for LRHs.

Evaluation concept		Criteria	Sources
Service content	1.	staff service attitude	Ernst & Young (1995)
	2.	staff looks, expression and quality	Gadotte and Turgeno (1988)
	3.	ratio of staff to guest rooms	Yesawich (1988)
	4.	service quality	Yu (1987)
	5.	food and beverage quality	Wu (1991)
	6.	varied food and beverage offerings	College of Commerce in National Chengchi University (1991)
	7.	sanitary and well maintained environment	Chen (1993)
	8.	convenient booking information system	Lee (1993)
	9.	personal service design	Fang (1997)
	10.	delicate and multiple product design	Zheng (1998)
Equipment content	1.	sophisticated and high quality guestroom fittings	Ernst & Young (1995)
	2.	attractive interior design in guestrooms	Yesawich (1988)
	3.	attractive furnishings in guestrooms	Chan (1989)
	4.	spacious guestrooms	Parasuraman (1991)
	5.	attractive fittings throughout hotel	Delafose (2003)
	6.	attractive interior design throughout hotel	Yu (1987)
	7.	high quality leisure equipment and unique field	Cheng (1990)
	8.	attractive architectural and landscape design	Wu (1991) Chen (1993) Fang (1997) Zheng (1998)
Operation and management	1.	superior location	Ernst & Young (1995)
	2.	shuttle service or convenient transportation connections	Gadotte and Turgeno (1988)
	3.	financial cost control and management	Yesawich (1988)
	4.	price	Chan (1989)
	5.	high market share	Parasuraman (1991)
	6.	correct market segmentation	Delafose (2003)
	7.	reputation and brand awareness	Yu (1987)
	8.	international chain system	Cheng (1990)
	9.	marketing promotion	Wu (1991)
	10.	business scope	College of Commerce in national chengchi university (1991) Chen (1993) Lee (1993) Tsai (1996) Feng (1997) Chung-Hua Institution for Economic Research (1997) Xie (1998) Xu (1998) Zheng (1998)

(*Continued*)

Table 2. (*Continued*).

Evaluation concept		Criteria	Sources
Customer orientation	1.	consumer satisfaction	Ernst & Young (1995)
	2.	consumer complaint management	Gadotte and Turgeno (1988)
	3.	consumer perceives higher than usual price to value ratio	Yesawich (1988)
	4.	consumer perceives their experience as owned by some specific individual	Vigneron and Johnson (2004)
	5.	consumer perceives high exterior and interior hospitality quality	Zheng (1998)
	6.	consumer perceives the hotel as a trendy and stylish establishment	
	7.	consumer perceives the hotel as possessing unique characteristic	

Source: Author's calculations.

It is worth noting that in the literature there are many studies that have developed a lot of applications with fuzzy systems in a wide range of decision making fields (Gil-Aluja et al., 2009; 2011; Gil-Lafuente, 2005; Gil-Lafuente and Merigó, 2010; Jeng and Bailey, 2012; Merigó and Gil-Lafuente, 2010, 2011; Merigó et al., 2011, 2012).

This study introduces the use of fuzzy theory into the Delphi method by integrating it with the points of view of many scholars, including Kaufmann and Gil-Aluja (1986) and Hsu (1998). In order to improve the problems faced by the traditional Delphi method, this study has used the bi-triangular fuzzy arithmetic to integrate the advice of experts and has then tested the convergence effect recognised by experts that refers to the 'grey zone test method'. FDM is established by means of the following steps:

Step 1. Each expert respectively offers a possible interval value to each assessed item. The minimum value of this interval number represents the most conservative perceived value given by the expert to the quantitative score of the assessed item, while the maximum value represents the most optimistic perceived value given to the quantitative score of the assessed item.

Step 2. This involves performing an analysis of the 'most conservative perceived values' and 'the most optimistic perceived values' given to each assessed item i by all of the experts. After the extreme values falling outside the 'two times the standard deviation' are eliminated, the minimum value C_L^i, the geometric mean C_M^i, and the maximum value C_U^i of 'the most conservative perceived value' that has not been eliminated, as well as the minimum value O_L^i, the geometric mean O_M^i and the maximum value O_U^i of 'the most optimistic perceived value' are determined.

Step 3. Through the foregoing steps, the triangular fuzzy number $C^i = (C_L^i, C_M^i, C_U^i)$ of 'the most conservative perceived value' and the triangular fuzzy number $O^i = (O_L^i, O_M^i, O_U^i)$ of the 'the most optimistic perceived value' of each assessed item i can be established.

Step 4. Finally, the following methods can be applied to verify the degree of consensus by experts.

3.1.1. The grey zone does not exist

If $C_U^i \leq O_L^i$, namely, the bi-triangular fuzzy number has no overlap, this means that the interval values given by the experts share the common section. That is the most conservative perceived values given by each expert to the assessed item i tend to move towards the section scope of the triangular fuzzy number of the most conservative perceived value, and the most optimistic perceived value given by each expert to the assessed item i tends towards the section scope of the triangular fuzzy number of the most optimistic perceived value. It means that the most conservative perceived values and the most optimistic values given by all of the experts have reached a consensus as far as the assessed item i is concerned. Therefore, the value G^i regarding the importance of the degree of consensus of the assessed item i shall equal the mean value of C_M^i and O_M^i, and its operational formula is seen as follows:

$$G^i = (C_M^i + O_M^i)/2 \tag{1}$$

3.1.2. The grey zone exists, and a small difference exists among the experts' advice

If $C_U^i > O_L^i$, namely, the bi-triangular fuzzy number has an overlap, and when the grey zone of the fuzzy relation $Z^i = C_U^i - O_L^i$ is smaller than the interval value $M^i = O_M^i - C_M^i$ between the geometric mean of the optimistic perceived value and the geometric mean of the conservative perceived value given by the experts to the assessed item, although the interval value given by each expert produces a fuzzy section, the extreme values given by some experts do not greatly differ from the ones given by the other experts, and so no differences and divergences in terms of the value are caused. Therefore, the value G^i of the importance of the degree of consensus of the assessed item i shall equal the fuzzy set $F^i(\chi_j)$ resulting from the intersection (min) operation for the grey zone of the fuzzy relation of the bi-triangular fuzzy number, and the quantitative score of the maximum value of the membership grade $\mu_{F^i}(\chi_j)$ owned by the fuzzy set shall then be figured out. Its operational formulas are seen as follows:

$$F^i(x_j) = \left\{ \int_x \{\min[C^i(x_j), O^i(x_j)]\} dx \right\} \tag{2}$$

$$G^i = \{\chi_j | \max \mu_{F^i}(\chi_j)\} \tag{3}$$

3.1.3. The grey zone exists, and big differences exist among the experts' advice

If $C_U^i > O_L^i$, namely, the bi-triangular fuzzy number has an overlap, and when the grey zone of the fuzzy relation $Z^i = C_U^i - O_L^i$ is bigger than the interval value $M^i = O_M^i - C_M^i$ between the geometric mean of the optimistic perceived value and the geometric mean of the conservative perceived value given by the expert to the assessed item, it means that the interval value given by each expert will be seen to produce a fuzzy section, and the extreme values given by some experts greatly differ from the ones given by other experts, so differences and divergences in the values are caused. Therefore, 'the geometric mean of the optimistic perceived value' and the 'geometric mean of the conservative perceived value' of the assessed items that have not reached convergence must be provided for the experts as references. Then, Steps 1 to 4 shall not be repeated to conduct the next questionnaire survey until all the assessed items reach convergence, and 'the value of the importance of the degree of consensus' G^i is figured out. The higher value of the

importance degree of each item figured out respectively in the foregoing paragraphs, the higher degree of consensus among the experts it stands for. The arithmetic mean could then be figured out by using the geometric mean of the most likely single value for each item, and be taken as the threshold value for the research to select a suitable number of assessment criteria featuring the consensus reached by of the experts.

3.2. Fuzzy Analytic Hierarchy Process

In incorporating Fuzzy Theory into the Analytic Hierarchy Process developed by Saaty (1980), we assess the weight attached to various assessment criteria and sort out their importance through which more objective and reasonable key success factors could be induced. This analytical process combines the concepts of several scholars, including Buckley (1985), Hsu (1998), Leung and Cao (2000), Lin and Lu (2012) and Robbins (1994) and has the advantage in that experts need to fill in only one definite value when making paired comparisons, without falling into the dilemma of not knowing how to specify the fuzzy number or the need to understand its definitions. In this context, it is worth mentioning the limitations discussed by Saaty and Tran (2007). However, in this article we try to simplify the model as much as possible.

Step 1. Establish the Hierarchical Structure. Based on the assessment criteria screened out by FDM and the sequence of the terminal target, secondary target, and assessed items, the hierarchal structure is established and each level has seven elements at most.

Step 2. Establish the Pairwise Comparison Matrix. The opinion of expert K at Level L on the relative importance of any two assessed items at Level L+1 could be obtained through the questionnaire survey, by which the pairwise comparison matrix A, $A = [a_{ij}]$ could be established.

Step 3. Establish the Triangular Fuzzy Number. This study has adopted the geometric average to represent the consensus of most experts as the model of the triangular fuzzy number. Afterwards, triangular fuzzy numbers were established based on FDM to integrate experts' fuzzy opinions on the relative importance of paired elements. It may be expressed as follows:

$$\widetilde{a}_{\mathrm{ij}} = (\alpha_{ij}, \delta_{ij}, \gamma_{ij})_{L-R} \quad \alpha_{ij} \leq \delta_{ij} \leq \gamma_{ij} i, \quad j = 1, 2 \ \cdots, n \tag{4}$$

$$\alpha_{ij} = \mathrm{Min}(B_{ijk}) \quad k = 1, 2 \cdots, n \tag{5}$$

$$\delta_{ij} = \left(\prod_{k=1}^{n} B_{ijk} \right)^{1/n} \tag{6}$$

$$\gamma_{ij} = Max(B_{ijk}) \quad k = 1, 2 \cdots, n \tag{7}$$

$\tilde{\alpha}_{ij}$: Minimum from expert countering the relative importance of both of criteria $_i$ and $_j$
δ_{ij}: Geometric average from expert countering the relative importance of both of criteria $_i$ and $_j$.
γ_{ij}: Maximum from expert countering the relative importance of both of criteria i and j.

B_{ijk}: Expert K's subjective opinion on the relative importance of attributes i and j, which is a definite value.
$L - R$: Fuzzy interval of triangular fuzzy numbers.

Step 4. Establish Fuzzy Positive Reciprocal Matrix. Triangular fuzzy numbers are established to express the phenomenon of assessing experts' fuzzy opinions. Hence, a fuzzy positive reciprocal matrix $\tilde{A}$ could be established.

$$\widetilde{A} = [\widetilde{a}_{ij}] = \begin{bmatrix} \widetilde{a}_{11} & \widetilde{a}_{12} & \dots & \widetilde{a}_{1n} \\ \widetilde{a}_{21} & \widetilde{a}_{22} & \dots & \widetilde{a}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \widetilde{a}_{n1} & \widetilde{a}_{ij} & \widetilde{a}_{n2} & \dots & \widetilde{a}_{nn} \end{bmatrix}, i,j = 1,2\ldots,n \tag{8}$$

$$\widetilde{a}_{ij} = [\alpha_{ij}, \delta_{ij}, \gamma_{ij}] \quad \widetilde{a}_{ij} \times \widetilde{a}_{ij} \approx 1, \forall_{ij} = 1,2,\ldots,n \tag{9}$$

Step 5. Fuzzy Matrix: $\tilde{A}$ Consistency Verification. We assume $A = [a_{ij}]$ is a positive reciprocal matrix and $\tilde{A} = [\widetilde{a}_{ij}]$ is the corresponding fuzzy positive reciprocal matrix. Hence, $A = [a_{ij}]$ is consistent, as well as $\tilde{A} = [\widetilde{a}_{ij}]$, by which we can judge the validity of the questionnaires. If experts think criterion i is more important than j, then the fuzzy paired comparisons are:

$$\widetilde{a}_{ij} = (\alpha_{ij}, \delta_{ij}, \gamma_{ij})\alpha_{ij}, \delta_{ij}, \gamma_{ij} \in \{1,2,\cdots,9\}$$

while

$$\widetilde{a}_{ji} = (\widetilde{a}_{ij})^{-1} = (\gamma_{ij}^{-1}, \delta_{ij}^{-1}, \alpha_{ij}^{-1}) \tag{10}$$

If experts think criteria i and j are equally important, the fuzzy pair wise comparisons Are $\widetilde{a}_{ij} = (1,1,1)$.

Step 6. Calculate the Fuzzy Weight of the Fuzzy Positive Reciprocal Matrix.

$$\tilde{Z}_i = [\widetilde{a}_{ij} \otimes \ldots \otimes \widetilde{a}_{in}]^{\frac{1}{n}}, \quad \forall \mathrm{i} \;\; i, \quad j = 1,2\cdots,n \tag{11}$$

$$\tilde{W}_i = \tilde{Z}_i \otimes (\tilde{Z}_i \oplus \ldots \oplus \tilde{Z}_n)^{-1} \tag{12}$$

$\tilde{Z}_i$: Geometric average of triangle fuzzy numbers

$$\tilde{a_1} \otimes \tilde{a_2} \cong (\alpha_1 \times \alpha_2, \delta_1 \times \delta_2, \gamma_1 \times \gamma_2) \tag{13}$$

$$\tilde{a_1} \oplus \tilde{a_2} \cong (\alpha_1 + \alpha_2, \delta_1 + \delta_2, \gamma_1 + \gamma_2) \tag{14}$$

$$Z_1^{-1} = (\gamma_1^{-1}, \delta_1^{-1}, \alpha_1^{-1})_{L-R} \tag{15}$$

$$\tilde{a}_1^{\frac{1}{n}} = [\alpha_1^{\frac{1}{n}}, \delta_1^{\frac{1}{n}}, \gamma_1^{\frac{1}{n}}] \tag{16}$$

Step 7. Defuzzification. Since the weight of every element and assessed item is a fuzzy value, the single fuzzy weight must be obtained by the defuzzication process. This study has adopted the gravity method for defuzzification and it is expressed as follows:

$$W_i = \frac{W_{\alpha i} + W_{\delta i} + W_{\gamma i}}{3} \tag{17}$$

$W_{\alpha i}$: The left end fuzzy weight value of triangular fuzzy numbers, namely the minimum.
$W_{\delta i}$: The value of the grade of membership of the fuzzy weight which is 1.
$W_{\gamma i}$: The right end fuzzy weight value of triangular fuzzy members, namely the maximum.
W_i: Convert the fuzzy weight of the triangular fuzzy numbers into a single value.

Step 8. Normality weight (NW) values obtained are normalised to compare easily the importance of various major structural dimension criteria and secondary assessment criteria so that their sum is 1. The formula for weight normalisation is as follows:

$$NW_i = \frac{W_i}{\sum_{i=1}^{n} W_i} \tag{18}$$

NW_i: normalised weight.
W_i: single fuzzy weight.

3.3. Establish evaluation criteria in LRHs

(1) **Primary hierarchy of LRHs:** This investigation aims to establish basic evaluation criteria for the LRH industry. This study thus used the literature on luxury and resort hotel characteristic to construct a primary hierarchy framework that it then applied to evaluate LRHs in Taiwan and Macao. The proposed framework regards the establishment of the evaluation criteria of LRHs as the ultimate goal, and is extended to main concepts and 28 evaluation criteria (Figure 1).
(2) **Operating definition of evaluation criteria:** Based on the literature review and primary hierarchy framework (Figure 1), operating definitions were selected for 'service content', 'equipment content', 'operation and management' and 'customer orientation'.
(3) **Questionnaire design process:** This investigation employed FDM to obtain expert opinions to identify individual concepts and associated evaluation criteria. Finally, based on the results of expert evaluations, this study constructed a fuzzy analytic hierarchy and assigned relative weight to extract key factors from the hierarchy framework for use as evaluation criteria.

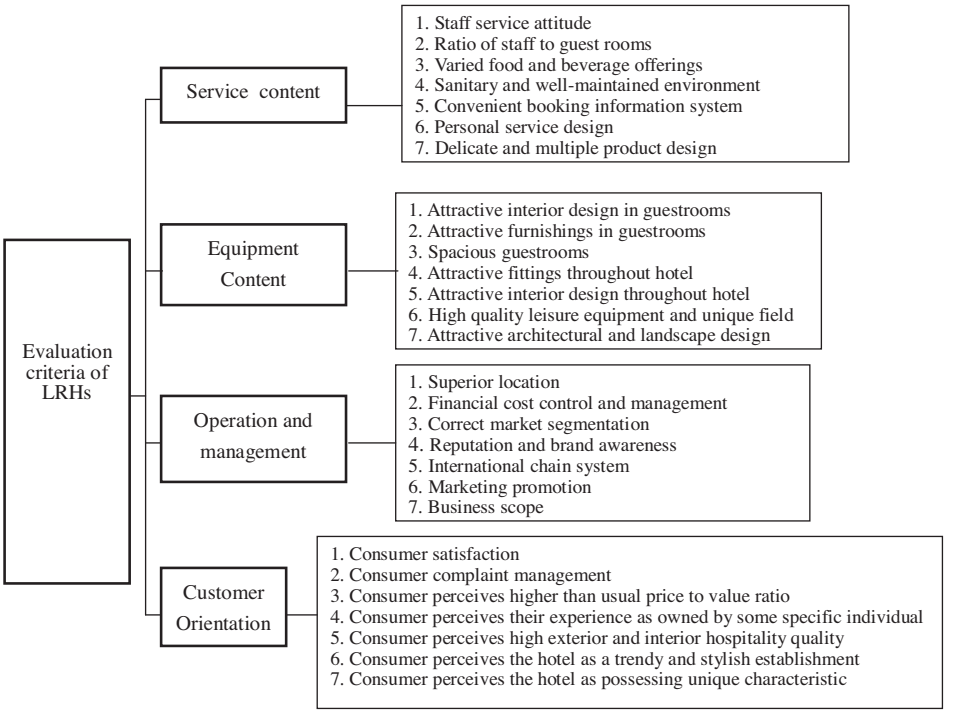

Figure 1. Primary hierarchy frameworks.
Source: Author's calculations.

(4) **First and the second stage questionnaire design:** The first stage of questionnaire design was based on the above primary hierarchy framework and utilised fuzzy Delphi questionnaire to assess each measurement concept and evaluation criteria. This questionnaire comprised three parts, including questionnaire instruction, questionnaire content and basis data. Furthermore, all the criteria were measured using a scale ranging from zero to 10, with the higher grades indicating the higher importance. On the other hand, each criterion must complete an acceptance scope and single value of importance level. The questionnaire also provided a space for experts to express their professional opinions and assign a total grade for each concept.

During the second stage, the questionnaire adopted a fuzzy hierarchy analytic method to perform follow-up research. The questionnaire used the analytical conclusions from the first stage to establish an integrity structure for forming the criteria standard of the second stage. The questionnaire comprised two main sections, importance ranking and the paired relative comparison of the evaluation criteria. These two main sections used a scale ranging from zero to nine for relative importance weighting, and utilised the paired comparison method for all experts in completing the questionnaire.

4. Empirical application of the evaluation criteria model in the luxury resort hotel industry

4.1. The conclusion in Taiwan-Construct the hierarchy structure from experts' common consensus

During the first stage, 36 fuzzy Delphi expert questionnaires were distributed from April 1 to April 10 in 2009. Some 25 valid questionnaires were returned (representing an effective response rate of 69.4%). Since the number of replies was significant, it was considered acceptable to develop the analysis.

This investigation applied the method of Lee (2006) who designed an EXCEL programme based on the fuzzy Delphi operation model and the statistical software EXCEL Expert Choice 2000 to calculate the relative number. First, this study utilised the 'bi-triangle fuzzy number' to identify evaluation criteria, and then analysed the received completed questionnaires.

Step 1. Each expert gave a potential interval-value aimed at every criteria item. The minimum interval-value means 'the most conservative perceived values' from all experts' evaluated each one's quantification fraction. On the contrary, the maximum interval-value means 'the most optimistic perceived values' from all experts.

Step 2. Then, it aimed to analysis 'the most conservative perceived values' and 'the most optimistic perceived values' of each criteria item (i) from all experts. The observation value might be cast if it fell on twice of standard deviation. After that, it got the minimum value C^i_L, geometric mean C^i_M, the maximum value C^i_U from 'the most conservative perceived values', and got the minimum value $O^i{}_L$, geometric mean, the maximum value O^i_U from 'the most optimistic perceived values'.

Step 3. Bases on step, it might set triangular fuzzy number $C^i = (C^i_L, C^i_M, C^i_U)$ of 'the most conservative perceived value' and $O^i = (O^i_L, O^i_M, O^i_U)$ of 'the most optimistic perceived value' from each criteria item.

Step 4. Finally, it precedes the following methods to test the level of all experts' common consensus.

- If $C^i_U \leqslant O^i_L$, it means there are no overlap phenomenon in bi-triangular fuzzy number. Furthermore, it also expresses all experts' suggestions possessed common consensus. For this reason, it makes the important level value of common consensus (G^i)equal to the arithmetic mean from C^i_M to, and uses $G^{i=\frac{C^i_M+O^i_M}{2}}$ to calculate.
- If $C^i_U > O^i{}_L$, it shows an overlap phenomenon in bi-triangular fuzzy number. Furthermore, the grey-region of fuzzy relationship expressed like $Z^i = C^i_U - O^i{}_L \leqq M^i = -C^i_M$. There exists fuzzy section, but the extreme value does not exceed too much compared to the other expert's suggestions to cause discrepancy and examination.
- If $C^i_U > O^i{}_L$, it shows an obvious overlap phenomenon in bi-triangular fuzzy number. As well as the grey-region of fuzzy relationship expressed as $Z^i = C^i_U - O^i{}_L \geqq M^i = -C^i_M$. Moreover, it means each expert's suggestion accounts an uncommon conscious region. So, it might supply these undiscrepancy data to all experts and repeats foregoing steps until it figured out G^i.

Step 5. Based on step 4, it calculates G^i from each criterion. The higher G^i value means the higher common conscious level of experts. After all, it uses the most possible geometric mean from each criterion to get arithmetic mean (the *threshold value in this investigation*).

This study obtained a threshold value of 8.0, and also expressed that if the value of G^i from all criterion exceeding 8.0 is reserved rather than being deleted. Finally, the result is the deletion of 11 evaluation criteria and the retention of 17 (effective ratio is 60.71%) (Table 3). Moreover, this study uses Figure 3 to design the second stage expert questionnaire, and provides that questionnaire to managers, officials and scholars involved in tourism. Subjects then evaluate the relative importance of the various evaluation criteria. Finally, this study determines the relative weights of the various criteria by applying FAHP to identify real evaluation criteria in the Taiwanese LRH industry.

4.2. Search out and construction of the evaluation criteria in LRHs industry

Based on the results obtained during the first stage, the FAHP questionnaire was designed for the second stage. This study utilised the retrieved questionnaires to construct the fuzzy Positive Reciprocal Matrix and used Consistency Verification to count the Consistency Index (C.I.) and Consistency Ratio (CR). Thereafter, this study calculated the fuzzy weight and normality weight values of the evaluation criteria for each concept. Finally this study focused on these result to rank the importance of the weights, and adopted FAHP analytic software Expert Choice 2000 to calculate those key judgment value.

During the second stage, a further 30 fuzzy Delphi expert questionnaires were distributed between April 21 to April 31 in 2009. Twenty-two valid questionnaires were returned, for an effective response rate of 73.3%.

4.3. Construction of the evaluation criteria in the LRH industry

From the result listed in Table 4, the consistency ratio hierarchy (CRH) is 0.07, fitting the normal scope of CRH < 0.1. The relationship between each evaluation criteria in the construction hierarchy structure and the model consistency thus is acceptable. Finally, each evaluation criteria in each concept is used to calculate the relative weight (local priority) and the global priority is obtained to clarify the weight ratio of each of the evaluation criteria in the structure.

According to Daniel (1961), three to six key criteria that govern achievements in any industry. Therefore, this study extracted six evaluation criteria to assess the Taiwanese luxury leisure hotel industry. Some consumers perceived the ratio of price/value to be raised. Moreover, others perceived the exterior and interior quality as highest. Consumers thus perceived hotels as excellent when they offered unique characteristics, correct market segmentation, superior location and management scope, and integrated building and landscape design.

4.4. Empirical application in Macao

The evaluation criteria formation process is the same as described above, and the second stage questionnaires were distributed to managers, government officials and researchers

Table 3. Analytic table of fuzzy Delphi questionnaire.

Concept	Evaluation criteria	The most optimistic perceived values (O_L^i, O_M^i, O_U^i)			The most conservative perceived values (C_L^i, C_M^i, C_U^i)			Geometric mean	M^i	Z^i	Interval value of expert opinion	G^i
Service content	Staff service attitude	8	9.6	10	4	7.2	9	8.1	3.2	1	★	8.4
	Ratio of staff to guest rooms	9	9.7	10	6	6.9	8	8.4	2.8	−1	○	8.3
	Varied food and beverage offerings	8	9.5	10	5	6.1	7	7.7	3.4	−1	○	7.8
	Sanitary and well-maintained environment	7	9.3	10	4	6.1	8	8.1	3.2	1	★	7.6
	Convenient booking information system	7	9.2	10	3	6.1	7	7.6	3.1	0	○	7.7
	Personal service design	9	9.8	10	5	6.9	8	8.6	2.9	−1	○	8.3
	Delicate and multiple product design	9	9.7	10	5	6.6	8	8.3	3.1	−1	○	8.2
Equipment content	Attractive interior design in guestrooms	7	9.1	10	3	6.2	8	7.6	2.9	1	★	7.5
	Attractive furnishings in guestrooms	9	9.8	10	3	6.3	9	7.8	3.5	0	○	8.1
	Spacious guestrooms	9	9.7	10	5	6.3	8	7.9	3.4	−1	○	8.0
	Attractive fittings throughout hotel	9	9.9	10	5	6.8	8	8.5	3.1	−1	○	8.4
	Attractive interior design throughout hotel	9	9.7	10	3	6.3	7	8.0	3.3	−2	○	8.0
	High quality leisure equipment and unique field	9	9.7	10	3	6.4	8	8.3	3.3	−1	○	8.1
	Attractive architectural and landscape design	8	9.4	10	5	6.6	8	8.3	3.0	0	○	8.0
Operation and management	Superior location	8	9.6	10	5	6.6	8	8.1	3.0	0	○	8.1
	Financial cost control and management	7	8.4	10	6	6.6	7	8.4	1.8	0	○	7.5
	Correct market segmentation	8	9.6	10	5	6.7	8	8.3	2.8	0	○	8.2
	Reputation and brand awareness	7	9.3	10	2	5.6	7	7.4	3.6	0	○	7.4
	International chain system	8	9.5	10	5	6.5	8	8.0	3.1	0	○	8.0
	Marketing promotion	8	9.5	10	5	6.8	8	8.3	2.7	0	○	8.1
	Business scope	8	9.2	10	4	6.1	8	7.7	3.1	0	○	7.7
Customer orientation	Consumer satisfaction	8	9.4	10	4	6.0	7	7.7	3.4	−1	○	7.7
	Consumer complaint management	8	9.2	10	3	5.5	7	7.3	3.0	0	○	7.4
	Consumer perceives higher than usual price to value ratio	8	9.5	10	5	6.5	7	8.2	3.0	−1	○	8.0
	Consumer perceives their experience as owned by some specific individual	8	9.4	10	5	6.1	7	7.8	3.2	−1	○	7.7
	Consumer perceives high exterior and interior hospitality quality	9	9.7	10	4	6.3	8	7.9	3.4	−1	○	8.0
	Consumer perceives the hotel as a trendy and stylish establishment	7	8.9	10	2	5.4	7	6.8	3.5	0	○	7.2
	Consumer perceives the hotel as possessing unique characteristic	8	9.4	10	5	6.9	8	8.4	2.5	0	○	8.1
Threshold value (Gi)	8.0											

Note: [1]○ indicates $C_U^i \leqslant O_L^i$ that experts' opinions in the consensus section, and utilised $G^i = (C_M^i + O_M^i)/2$ to calculate. ★ indicates $C_U^i > O_L^i$, and $Z^i = C_U^i - O_L^i \leqq M^i = O_M^i - C_M^i$. It calculates fuzzy set by min and get G^i.

Source: Author's calculations.

Table 4. Evaluation results of LRHs in Taiwan.

Main concept	Weight on concept	Evaluation criteria	Hierarchy weight	Absolute weight	Importance ranking
Service content	0.203	Staff service attitude	0.252	0.051	10
		Ratio of staff to guest rooms	0.240	0.049	12
		Personal service design	0.268	0.064	7
		Delicate and multiple product design	0.240	0.049	12
Equipment content	0.237	Attractive interior design in guestrooms	0.157	0.037	11
		Attractive furnishings in guestrooms	0.151	0.036	14
		Spacious guestrooms	0.166	0.039	9
		Attractive fittings throughout hotel	0.105	0.029	17
		High quality leisure equipment and unique field	0.143	0.034	16
		Attractive architectural and landscape design	0.270	0.064	6
Operation and management	0.293	Superior location	0.287	0.084	5
		Correct market segmentation	0.297	0.087	4
		International chain system	0.204	0.060	15
		Marketing promotion	0.212	0.062	7
Customer orientation	0.268	Consumer perceives higher than usual price to value ratio	0.338	0.091	1
		Consumer perceives high exterior and interior hospitality quality	0.333	0.089	2
		Consumer perceives the hotel as possessing unique characteristic	0.329	0.088	3
		C.R.H.=0.07			

Source: Author's calculations.

in hospitality industry in Macao from May 12 to 17 in 2009. The expert questionnaires were distributed 13 subjects, and 13 effective questionnaires were returned (representing an effective response rate of 100%) (Table 5). The CRH was 0.0044, fitting the normal scope of CRH < 0.1. The relationship between each of the evaluation criteria in the construction hierarchy structure and the model consistency thus is acceptable.

5. Conclusions and recommendations

Construction of the evaluation criteria for the Taiwanese LRHs industry and the Macanese luxury casino hotel industry.

(1) LRHs in Taiwan and Luxury casino hotels in Macao

Regarding the criteria for defining LRHs in Taiwan, specialists stress the indicators from the aspects of customer orientation and management, including customer perceptions of above average price/value ratio, customer perceptions of the quality of the external and interior appearance of a hotel, customer perceptions of a hotel as

Table 5. Evaluation results of luxury casino hotels in Macao.

Main concept	Weight on concept	Evaluation criteria	Hierarchy weight	Absolute weight	Importance ranking
Service content	0.110	Staff service attitude	0.141	0.018	13
		Personal service design	0.185	0.024	12
		Delicate and multiple product design	0.196	0.026	11
Equipment content	0.232	Attractive interior design in guestrooms	0.157	0.033	10
		High quality leisure equipment and unique field	0.245	0.051	8
		Attractive architectural and landscape design	0.442	0.103	4
Operation and management	0.331	Superior location	0.381	0.126	1
		Correct market segmentation	0.260	0.086	5
		International chain system	0.144	0.048	9
		Marketing promotion	0.215	0.071	6
Consumer orientation	0.327	Consumer perceives higher than usual price to value ratio	0.370	0.121	2
		Consumer perceives high exterior and interior hospitality quality	0.233	0.069	7
		Consumer perceives the hotel as possessing unique characteristic	0.364	0.120	3
		C.R.H.=0.044			

Source: Author's calculations.

offering unique features, correct market differentiation, excellent location and operation scale, and so on. The final indicator is outstanding overall architectural and landscape design.

Basically Macao and Taiwan do not differ significantly in terms of the criteria used to define LRHs in the industrial, government and academic sectors. However, the specialists in Macao are more prone to construct measuring indicators using the management aspect of LRHs as their primary indicator in hotel assessment, including excellent

Table 6. Importance ranking of evaluation criteria in Taiwan and Macao.

	Luxury resort hotel in Taiwan	Luxury casino hotel in Macao
1	Consumer perceives higher than usual price to value ratio	Superior location
2	Consumer perceives high exterior and interior hospitality quality	Consumer perceives higher than usual price to value ratio
3	Consumer perceives the hotel as possessing unique characteristic	Consumer perceives the hotel as possessing unique characteristic
4	Correct market segmentation	Attractive architectural and landscape design
5	Superior location	Correct market segmentation
6	Attractive architectural and landscape design	Marketing promotion

Source: Author's calculations.

location and operation scale, correct market differentiation and marketing and promotional activities. Other indicators include customer perceptions of a hotel as possessing unique features, customer perceptions of an above average price/value ratio and outstanding overall architectural and landscape design (Table 6).

The indicator development reveals that for LRHs, the service and equipment content aspects considered by regular hotel businesses as central in consumer evaluations of their overall hotel experience are not their main focuses. Instead, these aspects concentrate on investing in more creative thinking and improving management and customer orientation to emphasise and provide integrated corporate service design, and convey the corporate concept to all interested parties to establish relationship networks and be ready to adjust corporate management directions and strategies in response to environmental changes. That is, maintaining flexibility in management is critical for LRHs.

(2) Verification of related theories

This study finds that the criteria for defining luxury hotels are principally based on the 'management' aspect and 'customer orientation' aspects. This finding shows that the criteria thus differ from the 'service content' and 'equipment content' aspects emphasised by various countries and hotel evaluation organisations in previous efforts to design related indicators and used as a reference by rating agencies in awarding stars to a hotel (WTO, AAA, AA, ETB, US Mobil, Public Institutional Investors and Taiwan Tourism Bureau). However, in their *Cornell Hotel and Restaurant Administration Quarterly*, Su and Sun (2007) proposed that when using the five aspects of SERVQUAL (Parasuraman et al., 1985) to measure the hotel evaluation system of Taiwan, the results demonstrate a lack of indicators employing a consumer perspective. Moreover, hotel evaluation systems should be continuously updated to adjust the judgment guidelines in line with different industrial environments or eras. Using an evaluation system simply because it has a long history of use in Taiwan or abroad is illogical. This argument coincides with the results of the criteria for defining luxury hotels established in this study, suggesting that future construction of hotel-related indicators should be constantly updated to reflect environmental change.

(3) Significance of management

- Geographic differences in organisation cultures

  A basic concept in business management is that corporate image and operation strategy must match consumer demand. However, businesses frequently relegate this concept to the status of a slogan. Eventually, strategy formulation or design and planning, fall victim to corporate myths like limited resources, economic benefits, environmental pressures and so on. When this happens a business finds itself trapped in a negative cycle.

  Focused on hotel management and customer orientation, the criteria for defining LRHs established in this investigation with assistance from specialists from the industrial, government and academic sectors differ from those developed in other countries or tourism organisations, that focus more on evaluating hotel service and equipment offerings.

Furthermore, Taiwanese experts believe adopting customer perspectives and expectations in designing business management tactics realises a 'customer orientation'. However, hospitality specialists in Macao are committed to satisfying customer demand through systematic management approaches because customers need luxury experience models designed by hotel operators to fully understand luxury. Therefore, luxury hotels must simultaneously act as service providers, luxury experience designers and cultural educators. Luxury denotes a social tendency to upgrade human life and covers diverse aspects and meanings. More than a product or synonym of social status or money game, luxury is an expensive new means by which individuals can make their lives more colourful, enhance their emotional state and expand their horizons.

The empirical findings in this study prove different organisation cultures can take shape in LRHs development owing to locality, causing performance variation. This suggests geographic differences can impact organisation cultures.

- Differences in the industrial characteristics of LRHs between Taiwan and Macao

A combination of the basic data from the overall research, interviews, literature examination and empirical findings presented in this investigation reveals the following phenomena in the current development of LRHs in Taiwan and Macao.

- Differences in the consumer market

The development of LRHs in Taiwan and Macao has been driven by their financial, economic and social, cultural aspects, leading to the differences in tourism development, international standards, and foreign investment interest between both places. This development in turn has caused totally different outcomes in terms of GNP, international competitiveness and foreign exchange earnings. Key factors include LRHs in Macao which have invested in international management teams. This Macanese LRHs is oriented towards the global travel market in terms of their operational targets, client sources and competitors. Consequently, these LRHs define themselves as 'international operations'.

In Taiwan, LRHs position themselves more as 'domestic businesses' in running their operations, and their customers are primary Taiwanese. In the short term, these LRHs can continue growing within the small Taiwanese market. However, in the long term, they will need to respond to the changing travel market (particularly the opening up of Taiwanese tourism to visitors from China). Thus, they should seriously consider how to define their markets using 'international' or 'global' tactics.

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