Using a revised Importance-Performance Analysis approach—the case of Taiwanese hot springs tourism

1. Introduction

Delivering superior customer value and satisfaction are crucial to the competitive edge of a firm (Kotler and Armstrong, 1997; Weitz and Jap, 1995). Undoubtedly, service quality and customer satisfaction are principal drivers of financial performance. Matzler et al. (2004) contended that customer satisfaction increases customer loyalty, reduces price sensitivity, increases cross-buying and increases positive word of mouth. Hansemann and Albinsson (2004) also noted that customer satisfaction directly influences customer retention and firm market share. Numerous empirical studies have confirmed the positive correlation between customer satisfaction and profitability (Anderson et al., 1994; Hallowell, 1996; Johnson et al., 1996; Eklof et al., 1999; Zeithaml, 2000). Therefore, improving customer satisfaction is a critical issue for business managers in today’s competitive global marketplace. With this goal in mind, numerous business managers are continually attempting to identify critical service performance factors that generate customer satisfaction and loyalty in order to stay abreast of competitors.

Numerous practitioners and researchers have applied importance-performance analysis (IPA) to identify the critical performance factors in customer satisfaction survey data for
products and services (Hawes and Rao, 1985; Yavas and Shemwell, 1997; Tikkanen et al., 2000; Chu and Choi, 2000; Huana et al., 2002; Zhang and Chow, 2004; O'Neill and Palmer, 2004; Enright and Newton, 2004). Hansen and Bush (1999) pointed out that IPA is a simple and effective technique that can assist practitioners in identifying improvement priorities for customer attributes and direct quality-based marketing strategies. Practitioners apply IPA to analyze two dimensions of customer attributes: performance level (satisfaction); and, importance to customers. Analyses of these dimension attributes are then integrated into a matrix that helps a firm identify primary drivers of customer satisfaction and, based on these findings, set improvement priorities, and identify areas of “possible overkill” and areas of “acceptable” disadvantage (Matzler et al., 2004b). Hence, following a customer satisfaction survey and IPA, business managers can make rational decisions about how to best deploy scarce resources to attain the highest degree of customer satisfaction.

Although IPA is an extremely valuable method, previous studies have several important shortcomings. For example, Matzler et al. (2004a) noted the original IPA has two implicit assumptions: (1) attribute performance and attribute importance are independent variables; and, (2) the relationship between attribute performance and overall performance is linear and symmetrical. These assumptions are erroneous in the real world, the relationship between attribute-level performance and overall customer satisfaction is
asymmetrical (Kano et al., 1984; Matzler and Sauerwein, 2002; Ting and Chen, 2002; Matzler et al., 2003; Matzler et al., 2004a) and the relationship between attribute performance and attribute importance is causal (Sampson and Showalter, 1999; Oh, 2001; Ryan and Huyton, 2002; Matzler et al., 2004a).

Berman (2005) pointed out that customer delight is not same as customer satisfaction. Customer delight requires that customer receive a positive surprise that is beyond their expectations. He also mentioned that the must-be, satisfier, and delight attribute categorization system developed by Kano et al. (1984) is a popular means of better understanding customer delight. However, other studies of customer satisfaction suggest that satisfaction attributes can be understood using three categories: basic factors, performance factors, and excitement factors (Brandt, 1988; Johnston, 1995; Matzler et al., 1996; Oliver, 1997; Matzler and Hinterhuber, 1998; Anderson and Mittal, 2000; Matzler and Sauerwein, 2002). The performance of satisfaction attribute in different category had different impact on overall customer satisfaction perception. For example, if delight (excitement) attributes are not met, there is no feeling of customers’ dissatisfaction. But, if delight (excitement) attributes are met, they will generate customers’ delight. Therefore, analysts absolutely need to consider three-factor theory to identify critical service performance factors those generate customer satisfaction, delight and loyalty.
The aim of this study is to propose a revised IPA approach that comprises three-factor theory concept, partial correlation analysis and natural logarithmic transformation. The proposed revised IPA avoids shortcomings of traditional IPA that has two erroneous assumptions: (1) attribute performance and attribute importance are two independent variables, and (2) the relationship between attribute performance and overall performance is linear and symmetrical. The proposed revised IPA that includes the actual importance of satisfaction attributes assists business managers in resolving service quality management and customer satisfaction management issues and in achieving a competitive advantage.

The rest of this paper is organized as follows. Sections 2 review pertinent literatures particularly those about IPA and three-factor theory of customer satisfaction. To elucidate the real importance of attributes, Section 3 introduces a revised IPA approach. Section 4 then demonstrates the implementation of the proposed revised IPA for identifying critical tourist satisfaction improvement opportunities to improve Taiwanese hot springs tourism. Conclusions are finally drawn in Section 5.

2. Literature review

2.1 Importance-Performance Analysis

Importance-performance analysis has been applied as an effective means of evaluating
a firm’s competitive position in the market, identifying improvement opportunities, and

guiding strategic planning efforts (Martilla and James, 1977; Hawes and Rao, 1985; Myers,
1999). Importance-performance analysis, first introduced by Martilla and James (1977),
identifies which product or service attributes a firm should focus on to enhance customer
satisfaction (Matzler et al., 2004a). Typically, data from customer satisfaction surveys or
service quality surveys (using SERVPERF model (Cronin and Taylor, 1992)) with
pre-consuming measurement of customer attribute importance are utilized to construct a
two-dimensioned matrix. In this matrix, attribute importance is depicted along the x-axis
and attribute performance (satisfaction or service quality) is depicted along the y-axis.
Attribute importance is measured using some form of self-stated importance (e.g., rating
scales, constant sum scales, etc.) or implicitly derived importance (e.g., multiple regression
weights, structural equation modeling weights or partial correlation weights). The means of
performance and importance, commonly utilized in practice, divide the matrix into four
quadrants (Fig. 1).

Based on cell location, customer satisfaction or service quality attributes are deemed
as major or minor strengths and weaknesses. Attributes located in Quadrant I (both
performance and importance are high) indicate opportunities for achieving or maintaining
competitive advantage and are major strengths. The management scheme for this quadrant is “keep up the good work.” Attributes located in Quadrant II (performance is high and importance is low) indicate that business resources committed to these attributes would be overkill and should be deployed elsewhere. These attributes are minor strengths. The management scheme for this quadrant is “possible overkill.” Attributes in Quadrant III (performance and importance are low) are minor weaknesses and do not require additional effort. The management scheme for this quadrant is “low priority.” Attributes located in Quadrant IV (performance is low and importance is high) require immediate attention for improvement and are major weaknesses. The management scheme for this quadrant is “concentrate here.” The inability to identify these attributes can threaten a firm’s place in the market and typically results in low consumer satisfaction.

Based on this analysis, particular improvement opportunities are determined. For example, researchers commonly suggest that major weaknesses (Quadrant IV) should be top priority and targeted for immediate improvement efforts (Martilla and James, 1977). Conversely, attributes deemed major strengths (Quadrant I) should be maintained, leveraged, and heavily promoted (Lambert and Sharma, 1990).

Some studies have modified and extended IPA. However, the basic framework has largely remained the same (Sampson and Showalter, 1999). For example, O’Leary and
Adams (1982) presented a method for generating importance measures as a composite ranking of median importance scores and Pearson correlation coefficients. Crompton and Duray (1985) introduced a similar method utilizing Spearman’s rank order correlations, which are suited to non-parametric data. Dolinsky and Caputo (1991) only surveyed consumers to obtain attribute performance ratings for deriving importance indicators. Performance scores for attributes were then regressed on scores for overall customer satisfaction and the standard regression coefficients were used as measures of attribute importance. A minor variation on this approach is found in basic conjoint analysis that uses dummy variable regression to derive coefficients for specific attributes levels, and determines importance as a range of coefficients for each attribute (Liljander and Strandvik, 1993; Malhotra, 1996). Slack (1994) presented an IPA model with a modified framework to consider the relationship between importance and performance. Matzler et al. (2003) propose a revised IPA in which attribute importance is derived by partial correlation analysis between attribute performance and overall customer satisfaction. Therefore, two erroneous assumptions of traditional IPA (which are (1) attribute performance and attribute importance are independent variables; and, (2) the relationship between attribute performance and overall performance is linear and symmetrical) had been discussed and criticized in his literature.
Numerous researches about IPA application had published. In the field of tourism, IPA had been applied for assisting managers to deal with tourism related problems: (1) hotel selection factors of tourist (Chu and Choi, 2000); (2) critical quality attribute of tour guides’ performance (Zhang and Chow, 2004); (3) tourism destination competitiveness (Enright and Newton, 2004); and, (4) different segment-specific action strategy (Huana et al., 2002).

2.2 Three-factor theory of customer satisfaction

Kano et al. (1984) developed a model that distinguishes between different quality attribute types. Kano’s model divides product or service quality attributes into five distinct categories (attractive, one-dimensional, must-be, indifference and reverse), each of which influences customer satisfaction differently. Other studies of customer satisfaction, however, suggest that quality attributes can be understood using three categories: basic factors, performance factors, and excitement factors (Brandt, 1988; Johnston, 1995; Matzler et al., 1996; Oliver, 1997; Matzler and Hinterhuber, 1998; Anderson and Mittal, 2000; Matzler and Sauerwein, 2002) (Fig. 2). The basic factors are similar to must-be quality elements. The performance factors are similar to one-dimensional quality elements. The excitement factors are similar to attractive quality elements.

Insert Figure 2 here.
Matzler et al. (2004a) elucidate these three factors. Basic factors (dissatisfiers) are minimum requirements that produce consumer dissatisfaction when not fulfilled, but do not result in customer satisfaction when fulfilled or exceeded; that is, negative performance for these attributes has a greater impact on overall satisfaction than positive performance. Excitement factors (satisfiers) are attributes that increase customer satisfaction when delivered, but cause no dissatisfaction when not delivered. That is, positive performance for these attributes has a stronger influence on overall consumer satisfaction than negative performance. Performance factors produce satisfaction when performance is high and dissatisfaction when performance is low. The relationship between customer attribute performance and overall customer satisfaction is nonlinear and asymmetrical for basic and excitement attributes. For performance attributes, the relationship between customer attribute performance and overall satisfaction is linear and symmetrical (Ting and Chen, 2002; Matzler et al., 2004a).

Consequently, customer attributes have two key characteristics in three-factor theory. (1) Importance of a basic or excitement attribute is based on its performance. Basic attributes are crucial when performance is low and are unimportant when performance is high. Excitement factors are critical when performance is high and are irrelevant when performance is low (Sampson and Showalter, 1999; Ting and Chen, 2002; Matzler et al.,
2004a). (2) The relationship between attribute performance and overall customer satisfaction is asymmetrical. Consequently, the applicability of the traditional IPA model that utilizes explicit customer self-stated importance requires modification.

3. Methodology of the revised importance-performance analysis

3.1 Acquisition of Implicitly Derived Importance of Attributes

Since changes to attribute performance influences the relative importance of attributes, the self-stated importance explicitly stated by customers for each attribute is not practically feasible. Implicitly derived importance based on the attribute performance’s correlation with overall customer satisfaction already includes the characteristic of attribute category in three-factor theory and is superior to self-stated attribute importance. Thus, Matzler and Sauerwein (2002) and Matzler et al. (2004a) implicitly derived dimension attribute importance using a multiple regression analysis with overall customer satisfaction as a dependent variable and dimension attributes performance as independent variables.

Recently, Matzler et al. (2004b) noted between the single attribute variables a rather strong multicollinearity is to be expected. Therefore, he determines the potential influence of multicollinearity on regression coefficient estimation. Consequently, he declares multiple regression analysis is an inappropriate tool for deriving reliable impact measures.
when multicollinearity exists within independent variables. As suggested by Hair et al. (1995), partial correlation analysis is more suitable than regression analysis for quantifying the influence of independent variables on dependent variables when multicollinearity exists within independent variables. Therefore, Matzler et al. (2004b) used dichotomized partial correlation analysis with dummy variables to identify the three factors category of each single attribute.

A regression model utilizing natural logarithmic transformation of independent variables can capture more diminishing return or sensitivity for independent variables (Anderson and Sullivan, 1993). Thus, Brandt (1988), Mittal et al. (1998), Anderson and Mittal (2000) and Ting and Chen (2002) utilize multiple regression analysis with natural logarithmic dummy variables to determine the asymmetric influence of attribute performance on overall customer satisfaction.

As above description, this study presents a novel method integrated partial correlation analysis and natural logarithmic transformation for measuring implicitly derived importance of attribute. The approach of presented method comprises three steps:

Step 1: Transform all attributes performance (AP) into natural logarithmic form

\[
\text{AP}_i \rightarrow \ln(\text{AP}_i) \quad i = 1, 2, \ldots, n
\]  

(1)

\[n\] : the total number of attribute.
Step 2: Set natural logarithmic attributes performance (ln(AP)) and overall customer satisfaction (OCS) as variables in a multivariate correlation model.

Step 3: Execute partial correlation analysis for each attribute performance with OCS.

The partial correlation coefficient is the implicitly derived importance of attribute. For example, suppose that $X_1,X_2,X_3,X_4,...X_n$ are included in a multivariate correlation model. The coefficient of partial correlation between $X_1$ and $X_2$ when $X_3,X_4,...X_n$ are fixed is given by (Neter et al., 1985):

$$
\rho_{12|34...n} = \frac{\sigma_{1234...n}}{\sigma_{134...n}\sigma_{234...n}},
$$

Therefore, let OCS be $X_1$, $\ln(AP_1)$ be $X_2$ and the rest of $\ln(AP_i)$ are $X_3$ to $X_n$, the partial correlation coefficient of No. 1 attribute can be got by formula (2).

By applying this method, the potential problem of a linear and symmetrical relationship existing between attributes performance and overall customer satisfaction can be eliminated because the implicitly derived importance based on the attribute performance’s correlation with overall customer satisfaction already includes the characteristic of attribute category in three-factor theory. Furthermore, the potential problem of multicollinearity among independent variables when employing multiple regression analysis to measure implicitly derived importance of attributes can also be eliminated because the utilization of partial correlation analysis. The natural logarithmic
transformation of attributes also captures more sensitivity for correlation model variables.

3.2 The approach of revised IPA

The implicitly derived importance is calculated using by the method proposed in subsections 3.1 and then input into IPA. The information acquired by this revised IPA is very useful for managers when working on customer satisfaction or service quality improvements. The revised IPA comprises five steps:

Step 1: Gather customer perceptions for the performance of attributes. A questionnaire survey is commonly used for this step. The questionnaire measures attribute performance and overall customer satisfaction perception for focal services.

Step 2: Acquire implicitly derived importance of each attribute by performing natural logarithmic partial correlation analysis mentioned in section 3.1.

Step 3: Use the mean of all implicitly derived degrees of importance for attributes and the mean of all performance for attributes to divide the IPA matrix into four quadrants.

Step 4: Plot all attributes on the IPA matrix.

Step 5: According to the management scheme of each quadrant, IPA practitioners
decide the reasonable action plan for each attribute in each quadrant. In particular, the improvement priority for attributes in Quadrant IV (management scheme action is “concentrate here”) are the implicitly derived importance sequence for customer attributes. That is, improvement priority is based in the degree of attribute importance.

By applying this revised IPA approach, IPA practitioners have considered three-factor theory. Thus, the appropriate, effective and reasonable action plan for each attribute can be acquired.

4. The implementation of the revised IPA

In this section, an empirical research case is presented to demonstrate the application of the revised IPA for identifying tourist satisfaction improvement opportunities to improve hot springs tourism in Taiwan.

4.1 Profile of Taiwanese hot springs tourism

Hot springs tourism is an important recreational activity for both domestic and overseas tourists in Taiwan. In 2004, according to the statistics of the Taiwan Tourism Bureau, the annual number of inbound travelers is around 2.95 million. The major recreation activities of inbound travelers include shopping (66%), visiting night markets
(56%), visiting historical sites (41%), ecological tourism (30%), and hot spring tourism (17%) (Taiwan Tourism Bureau, 2005a). Furthermore, hot springs tourism represents 10% of the leisure activity of domestic tourism (Taiwan Tourism Bureau, 2005b). Consequently, the Taiwan Tourism Bureau organized a year long hot springs festival to attract overseas tourists to visit Taiwan in 1999. Simultaneously, a hot springs development and management plan was implemented. Moreover, the Hot Spring Law was established in July 2003 to effectively develop hot springs tourism. Consequently, hot springs tourism is undoubtedly a key sector within the Taiwanese tourism industry.

Taipei County is the most popular area for hot springs tourism among overseas visitors and is the location of most of the large, complete and modern hot springs leisure sites in Taiwan (Taiwan Tourism Bureau, 2005b). Additionally, the reserve of hot spring water in Taipei County comprises 40% of the total hot spring water reserve in Taiwan (Water Resources Agency, 2005). Furthermore, Taipei County is a major destination for overseas travelers because the capital-Taipei city and international airport are located in county. Consequently, Taipei County is a major hot springs tourism area for domestic as well as overseas tourists. According to the statistics of the Taiwan Tourism Bureau, one of the most popular tour packages recommended by the Taiwan Tourism Bureau is its “Hot Spring Tour” (Taiwan Tourism Website, 2005). Yangmingshan National Park and the Wulai
Special Scenic Area, located in Taipei County, rank among the ten most famous tourism sites for overseas tourists in Taiwan (ranking third and eighth, respectively). Annual visitor numbers for Yangmingshan National Park and the Wulai Special Scenic Area are 2.5 and 0.83 million, respectively (Taiwan Tourism Bureau, 2005c). The main leisure activities for both areas are ecotourism and hot springs tourism. Hence, hot springs tourism in Taipei County is taken to represent the Taiwanese hot spring industry as a whole and is adopted as the research scope of this study. This empirical study thus conducted satisfaction surveys targeting overseas tourists who had visited Yangmingshan National Park and the Wulai Special Scenic Area.

4.2 Questionnaire design

This study uses the performance-only approach (SERVPERF model) which does not use expectations to measure customer satisfaction (Churchill and Suprenant, 1982; Cronin and Taylor, 1992). Empirical support exists for the idea that the performance-only approach had higher reliability and validity than other approaches (Crompton and Love, 1995) and this approach has already been employed by several researchers to measure tourist satisfaction (Pizam et al., 1978; Qu and Li, 1997; Qu and Ping, 1999; Kozak, 2001).

Satisfaction attributes of hot springs tourism were generated via collecting data from
primary sources. Primary source data included open-ended questionnaires distributed to scholars, officers of tourism authorities, managers of hot spring enterprises, and a few veteran customers. Subsequently, 21 satisfaction attributes related to hot springs tourism were identified and a closed-ended and structured questionnaire was designed.

The questionnaire comprised three parts. The first part contained 21 statements reflecting the dimensionality of satisfaction with service levels of hot springs tourism in Taiwan. The respondents were asked to rate their levels of satisfaction in relation to the 21 statements. Each satisfaction attribute was rated using a five-point Likert scale, ranging from “very dissatisfied (1)” to “very satisfied (5)”. The second part contained a single statement regarding overall satisfaction level with the service of hot springs tourism, and this scale was also a five-point Likert scale. The third part of the questionnaire included respondent demographic information. The questionnaire was prepared in three versions: English; simplified Chinese (for Hong Kong and Macao tourists) and Japanese. Furthermore, prior to the formal survey, a preliminary trial of the questionnaire involving 30 overseas hot springs tourists was conducted to modify any ambiguous or misleading items.

4.3 Data collection
The respondents were sampled using an on-site intercept method. The questionnaire was administered at public parking lots and outside hot spring facilities at the Yangmingshan National Park and the Wulai Special Scenic Area. Research assistants worked in pairs and received comprehensive training in intercept survey skills. Overseas tourists who had just completed their hot springs tourism were asked if they would like to participate in the survey. Tourists completed the questionnaires themselves before leaving the hot spring facility based on their perceptions of hot springs tourism. The survey was conducted daily from March 1 to March 23, 2005. The survey period on each day was split into two parts: (1) 15:00 pm to 17:00 pm and (2) 19:00 pm to 21:00 pm, which were the peak business hours for hot springs tourism.

4.4 Respondent profile

A total of 600 tourists were asked to help complete the research survey, and 386 tourists accepted the invitation. Three-hundred and seventy-one valid and usable questionnaires were received. The demographic profiles of the overseas tourists are as follows. The sample included 238 (64.15%) males and 133 (35.85%) females among the respondents. The main age group was 36–45 and represented 36.1% of the respondents. The next biggest age group was 26-35 and represented 27.4% of the respondents. Most of
the respondents (67.1%) had a college or university level education. The main nationalities represented were Japan (52.61%), Hong Kong or Macao (32.18%), U.S.A. (4.11%), and Australia (3.52%).

4.5 Reliability and validity analysis

To verify reliability and construct validity of the formal questionnaire, factor analysis was conducted to verify the construct validity and Cronbach’s $\alpha$ value for each dimension was computed to verify the reliability. The factor analysis was based on the principal component analysis with varimax rotation, eigenvalue exceeding 1 and factor loadings exceeding 0.5. The test value of Kaiser-Meyer-Olkin (KMO) was 0.91. The p value of the Bartlett’s sphericity test was almost zero. Moreover, the cumulative variance explained is 63.246%. Consequently, the construct validity of the questionnaire was quite good (Kaiser, 1974). The 21 tourist satisfaction statements regarding hot springs tourism service in Taiwan were classified into four dimensions, namely “empathy and assurance”, “responsibility”, “tangibility” and “reliability.” Cronbach’s $\alpha$ values for each dimension of hot spring tourism service satisfaction ranged from 0.7567 to 0.8999 (Table 1.). This demonstrates that the scales of the formal questionnaire have considerable reliability (Cronbach’s $\alpha$ values for each dimension greater than 0.7) (Nunnally, 1978).
4.6 Perceived satisfaction of hot spring tourism

The mean and standard deviation of 21 satisfaction attributes related to hot springs tourism services in Taiwan were calculated. The results of a tourist satisfaction survey of 371 respondents are presented based on the mean performance score ranking of the tourist satisfaction attribute (Table 2). The mean scores for all 21 satisfaction attributes ranged from a high of 4.03 to a low of 3.52. All 21 satisfaction attributes had standard deviations below 1.08. Based on the survey data for overall satisfaction level with hot springs tourism services in Taiwan, the mean and standard deviation of overall satisfaction were 3.65 and 0.68, respectively. Consequently, overseas tourists ranked hot springs tourism services in Taiwan between “average” and “satisfied”. In the 21 tourist satisfaction attributes, only “Courtesy and friendliness of staff” received a ranking exceeding “satisfied.” Meanwhile, the attributes “Prompt response to tourists’ questions”; “Personal attention given by staff”; “Convenient opening hours”; and, “Never give any excuse for responding customer requests” were the four worst performing attributes, meaning that they had performance scores below the mean overall satisfaction (3.65) and potentially may require improvement to enhance tourist satisfaction.
4.7 Implicitly derived importance of tourist satisfaction attributes and dimensions

The implicit importance of each tourist satisfaction attribute and dimension was obtained by performing natural logarithmic partial correlation analysis mentioned in section 3.1. Figure 3 illustrates the Statistical Products and Services Solutions (SPSS) output of partial correlation coefficients for tourist satisfaction attribute No. 17 “Ease of obtaining staff attention and help”. The implicitly derived importance of attribute ranges between 0.2421 and 0.0049 (Table 3). Meanwhile, the mean of 21 implicitly derived importances is 0.0938. “Ease of obtaining staff attention and help” is the most important tourist satisfaction attribute. Meanwhile, “Convenient opening hours” is the less important tourist satisfaction attribute. Totally, 11 tourist satisfaction attributes had implicitly derived importance exceeding the mean. The implicitly derived importance of dimension ranges between 0.4525 and 0.2322 (Table 4). The most important tourist’s satisfaction dimension is “empathy and assurance” dimension. Therefore, the “empathy and assurance” dimension is possibly the main dimension for managers to focus on in seeking to improve tourist satisfaction with hot springs tourism in Taiwan.

Insert Figure 3, Table 3 and Table 4 here.
4.8 Revised importance-performance analysis grid

After obtaining the implicitly derived importance and satisfaction performance of all tourist satisfaction attributes, 21 tourist satisfaction attributes was plotted on the revised IPA grid. The grand means for implicitly derived importance and satisfaction performance were used to place the axes on the grid. Figure 4 shows that six attributes were identified in the “concentrate here” quadrant, five in the “keep up the good work quadrant”, five in the “low priority” quadrant and five in the “possible overkill” quadrant. For the point view of tourist satisfaction dimension, the revised IPA grid for dimension is showed in Fig. 5. Only “empathy and assurance” dimension was identified in the “concentrate here” quadrant.

Insert Figure 4 and Figure 5 here.

The “concentrate here” quadrant contained six attributes, “Ease of obtaining staff attention and help”, “Have the best interests of customers at heart”, “Understanding the specific needs of customers”, “Reasonable prices”, “Personal attention given by staff”, and “Never give any excuse for responding customer requests” were rated above average in terms of implicitly derived importance but below average for satisfaction performance. Meanwhile, “Ease of obtaining staff attention and help”, “Have the best interests of customers at heart” and “Understanding the specific needs of customers” attributes were
belonged to “empathy and assurance” dimension that have been identified in the “concentrate here” quadrant. According to the proposed step 5 of the revised IPA approach, the improvement priority for tourist attributes in the “concentrate here” quadrant is the sequence of implicitly derived importance degree. Since “Ease of obtaining staff attention and help” is the most important attribute it is suggested that improvement efforts and special attention should be directed to help calling system redesign and employee training about how to enable tourists to easily contact and reach service providers. Since “Have the best interests of customers at heart” and “Understanding the specific needs of customers” are the second and third most important attributes it is suggested that business managers should frequently understand customer voices and adjust the contents of services provided based on customer needs. Based on “Reasonable prices” being the fourth most important attribute it is suggested that business managers should readjust prices according to customer perceptions of value. Furthermore, “Personal attention given by staff” is the fifth most important attribute and thus it is suggested that business managers should ask employee to observe tourists continuously and help them immediately. Finally, given that “Never give any excuse for responding customer requests” is the last important attribute in the “concentrate here” quadrant and it is suggested that business managers should train employees to follow a standard response: apologize first, listen carefully, confirm the
problem of the customer, provide alternative solutions, execute the selected alternatives,
and confirm the effect of selected alternatives. Never give any excuse to deny customer
requests or questions. Consequently, these first three tourist satisfaction attributes that
belonged to “empathy and assurance” dimension are the major critical tourist satisfaction
improvement opportunities for hot springs tourism in Taiwan. The rest three tourist
satisfaction attributes that not belonged to “empathy and assurance” dimension are the
minor critical tourist satisfaction improvement opportunities.

5. Conclusion

This study proposed a revised IPA approach that comprises three-factor theory
concept, partial correlation analysis and natural logarithmic transformation. Unlike the
traditional IPA, the importance of attribute is implicitly derived by performing natural
logarithmic partial correlation analysis with overall customer satisfaction and all natural
logarithmic transformed attribute performance as variables in a multivariate correlation
model. The partial correlation coefficient derived form natural logarithmic partial
correlation analysis represents actual importance of attribute with thought of attribute
category in three-factor theory. Therefore, the revised IPA avoids shortcomings of
traditional IPA that has two erroneous assumptions: (1) attribute performance and attribute
importance are two independent variables, and (2) the relationship between attribute performance and overall performance is linear and symmetrical. Furthermore, from the point view of questionnaire survey workload, the revised IPA approach avoids the work of pre-consuming measurement of customer attribute importance. This unnecessary work is time consuming for both analyst and survey respondents.

IPA was originally developed as a tool to facilitate priority setting for improvement and resource allocation. Using invalid IPA to identify the potential improvement direction can cause incorrect improvement action and incorrect resource redistribution. Business managers must be aware changes to attribute performance (satisfaction) are associated with change to attribute importance since satisfaction attribute has three-factor theory characteristic. Consequently, the proposed revised IPA that includes the actual importance of satisfaction attributes assists business managers in resolving service quality management and customer satisfaction management issues without the flaw of traditional IPA. The effective and appropriate action for each satisfaction attribute acquired by applying the proposed revised IPA approach thus enables business managers to achieve a competitive advantage.

Acknowledgments
The author acknowledges two anonymous referees for their valuable comments and suggestions that led to substantial improvement in this paper. This research was supported by the National Science Council of the Republic of China (Grant No. NSC 95-2416-H-216-008) and the Chung-Hwa University of Twain (Grant No. CHU-95-2416-H-216-008).

References


North Central Forest Experiment Station.


Fig. 1. Importance-Performance Analysis
Fig. 2. Three-factor theory (adapted from Kano, 1984)
--- PARTIAL CORRELATION COEFFICIENTS ---

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(Coefficient / (D.F.) / 2-tailed Significance)

Fig. 3. Partial correlation coefficient of satisfaction attributes No. 17
Fig. 4. Revised IPA grid for attribute. Note: the number in grid is the statement number of questionnaire (see, Table 3)
Fig. 5. Revised IPA grid for dimension. *Note:* 1= Empathy and Assurance; 2= Responsibility; 3= Tangibility; 4= Reliability
Table 1. Results of factor analysis

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Cumulative variance explained 63.246%
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Table 3 Implicitly derived importance of tourist satisfaction attributes

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38
Table 4 Implicitly derived importance of tourist satisfaction dimensions

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