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ITJ

ISSN 1812-5638

# INFORMATION TECHNOLOGY JOURNAL

**ANSI***net*

Asian Network for Scientific Information  
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

## Integrating Service Quality Model in Quality Improvement: An Empirical Study of Employees Satisfaction for Hot Spring Industry

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**Abstract:** The study addresses this deficiency by integrating the ‘importance-satisfaction model (I-S Model)’ and the ‘Performance Control Matrix (PCM)’ to provide a more comprehensive assessment model for improving specific quality attributes. The study applies this integrated measuring instrument in Taiwanese hot spring industry using a questionnaire survey to assess ‘importance’ and ‘satisfaction’ in their capacity as ‘internal customers’ of the industry. The study identifies quality attributes that require improvement then applies the ‘Employee Satisfaction Index (ESI)’ to determine the priority of these items for improvement. The study demonstrates that the I-S Model and the PCM, taken together, provide an excellent measuring instrument for assessing priorities for quality improvement.

**Key words:** Employee satisfaction index, importance-satisfaction model (I-S model), performance control matrix, service quality

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### INTRODUCTION

In their efforts to sustain competitiveness and long-term profitability, businesses are increasingly aware of the importance of service and product quality if they are to attract new customers and retain existing customers (Yang, 2005). The provision of excellent customer service is recognized as a crucial business strategy in promoting overall business performance. Excellent service quality and high customer satisfaction have thus become extremely important issues for service industries (Hung *et al.*, 2003) and the level of service quality is now considered by managers and academics alike to be a critical measure of organizational performance (Yavas and Yasin, 2001). Many studies of service quality have examined the question of how best to measure the construct and thus facilitate the effective delivery of high-quality service (Parasuraman *et al.*, 1988; Yang, 2007). In the absence of objective measures, businesses must rely on consumers’ perceptions of service quality to identify their strengths and weaknesses if they are to devise appropriate improvement strategies. Managers therefore require psychometrically sound and useful instruments to measure service quality and customer satisfaction (Karatepe *et al.*, 2005).

Many models of service quality have been developed to assist business managers to identify service items that require improvement (Hung *et al.*, 2003). However, most models remain incomplete; in particular, most are unable to prioritize areas that require improvement (Chen *et al.*, 2006). The reality is that businesses generally

determine such priorities for improvement on the basis of attributes associated with low customer satisfaction, rather than considering actual customer requirements (Yang, 2003). Although, an approach based on satisfaction levels can lead to improvement in some quality attributes that are causing dissatisfaction, these attributes are not necessarily the main concern of customers. As Yang (2005) has pointed out, when managers are prioritizing areas of potential improvement in service delivery, the importance that customers attach to a given quality attribute is just as significant as the level of satisfaction with that attribute. In recognition of this fact, some scholars have been developing new models of quality improvement-such as the importance-satisfaction model (Yang, 2003), the service quality matrix (Hung *et al.*, 2003; Lin *et al.*, 2005) and performance control matrix (Lin *et al.*, 2006; Chen *et al.*, 2007).

Another factor that is worthy of consideration in quality-improvement models is the level of employee satisfaction. Employee job satisfaction has been shown to be one of the best predictors of turnover and it also can influence customers’ service quality (Chen *et al.*, 2006). A number of studies found a positive relationship between employee satisfaction, customer satisfaction and company performance. Additional recent research has shown that employee satisfaction can be linked to customer satisfaction. Most businesses focus on *customer* satisfaction when undertaking surveys of satisfaction and dissatisfaction (Comm and Mathaisel, 2000), while generally neglecting employee satisfaction. This is despite the fact that many studies have

established that employees are the 'internal customers' of a firm and that satisfied employees equate with satisfied end-customers (Nebeker *et al.*, 2001); indeed, employee satisfaction has as great influence on organizational performance as does customer satisfaction.

On the basis of this introductory discussion, the present study analyzes a service-quality model that takes into account both importance and satisfaction (that is, the I-S Model and the PCM); in addition, the study utilizes a survey of employee satisfaction in hot spring industry to analyze the model. The study identifies quality attributes that require improvement then applies the 'ESI' to determine the priority of these items for improvement.

### LITERATURE REVIEW

**Employee satisfaction:** The job satisfaction of employees has become a critical issue in the last two decades. A number of studies found a positive relationship between employee satisfaction, customer satisfaction and company performance (Homburg and Stock, 2005). Additional recent research has shown that employee satisfaction can be linked to customer satisfaction. Others have shown a relationship between a company's financial success and its commitment to management practices that treat people as assets. Linking information from employee opinion surveys to important organizational outcomes is one area of potential value. When elements of an organization's work environment can be shown to relate to important performance outcomes, these elements can be used to give a business a competitive advantage (Nebeker *et al.*, 2001). In past studies, companies frequently used employee surveys to assess job satisfaction and affective commitment. Therefore, satisfied employees tend to show a higher level of loyalty and commitment to their companies and are unlikely to leave their jobs. Indeed, successful service companies have invested resources into programs in order to increase their employees' performance and job satisfaction (Chen *et al.*, 2007).

Job satisfaction is defined as the overall sense of affection an employee has for the job situation. One of the most influential and most criticized works in this area is Herzberg's two-factor theory of motivation (Herzberg, 1966). It distinguishes between factors that can increase job satisfaction ('Motivators') versus those that can prevent dissatisfaction but do not lead to satisfaction ('Hygiene Factors'). Motivator factors include a sense of achievement, recognition, job description itself, duty, personal growth, promotion development and so on. Hygiene factors include company policy, administration management, supervision style, public relationship, working environment, salary and benefits.

Oshagbemi (1997) had measured job satisfaction dimensions for 566 college teachers which entailed teaching, research, administration and management, present pay, promotions, supervision/supervisor behaviour, behavior of co-workers and physical conditions/working facilities. Comm and Mathaisel (2000) used SERVQUAL to conduct questionnaire surveys on 606 employees of a private higher education organization to identify the determinants of satisfaction within educational organizations. The evaluation dimension findings were as follows:

- Work load
- Work atmosphere
- Decision making/involvement
- Ethics/fairness
- Customer focus/communications
- Supervision
- Goals and objectives
- Training and development
- Pay and
- Benefit

Kusku (2001) proposed applying employee satisfaction surveys to the employees of a Turkish college, and applied the following dimensions for measuring their satisfaction: general satisfaction, management satisfaction, colleagues, other working group satisfaction, job satisfaction, work environment and salary satisfaction. Meshal (2003) conducted employment satisfaction surveys on female employees in the Kuwaiti public Government Sector (KGS) and identified the following employment satisfaction factors: overall job satisfaction, pay and security, co-workers, supervision, promotion and content of work. Chen *et al.* (2006) used satisfaction surveys for the employees of Taiwanese higher education institution and applied the following six dimensions:

- Organizational vision
- Respect
- Result feedback and motivation
- Management system
- Pay and benefits and
- Work environment

Chen *et al.* (2007) conducted satisfaction surveys for high technology industry employees, and applied the following five dimensions:

- Work environment
- Pay and benefit
- Management system

- Motivation and
- Organization vision

The influential factors of employee satisfaction are complicated, and a single model to follow has not yet been formed. In combination of the research mentioned above, Maslow’s needs theory (Maslow *et al.*, 1998) and Herzberg’s two-factors theory (Herzberg, 1996) are also put together to contemplate. These factors or dimensions affect employee satisfaction and employee satisfaction influences enterprises’ competitive advantages (Chen *et al.*, 2007). Thus, an employee’s satisfaction assessment that consists of five dimensions is constructed for this case study:

- Work environment (four items)
- Pay and benefit (seven items)
- Management system (nine items)
- Motivation (four items) and
- Organization vision (four items)

**Importance-satisfaction model (I-S Model):** Several authors have contended that customers evaluate quality by using quality attributes that they recognize as important (Yang, 2005). In taking action to improve service quality, service providers should therefore prioritize quality attributes that have higher importance levels and lower satisfaction levels. In accordance with this rationale, Yang (2003) developed a model known as the I-S Model. This model is illustrated in Fig. 1. In using this model, importance scores (‘high’ or ‘low’) and satisfaction scores (‘high’ or ‘low’) enable each quality attribute to be placed in its appropriate quadrant in the matrix. These quadrants are designated as ‘excellent’ (high importance; high satisfaction), ‘to be improved’ (high importance; low satisfaction), ‘surplus’ (low importance; high satisfaction) and ‘careless’ (low importance; low satisfaction). Improvement strategies can then be based on the area in which each quality attribute is placed.

**Modified PCM and employee satisfaction index:** A performance matrix has been proposed to determine the best strategy for improving service quality and the level of satisfaction of customers (and/or employees) (Lambert and Sharma, 1990; Hung *et al.*, 2003; Lin *et al.*, 2006; Chen *et al.*, 2007). The performance matrix consists of nine zones that represent the effectiveness of various system-improvement items.

Hung *et al.* (2003) and Chen *et al.* (2007) have proposed the opinion of standardization to establish a similar performance matrix to evaluate operation performance for the semiconductor industry. This study

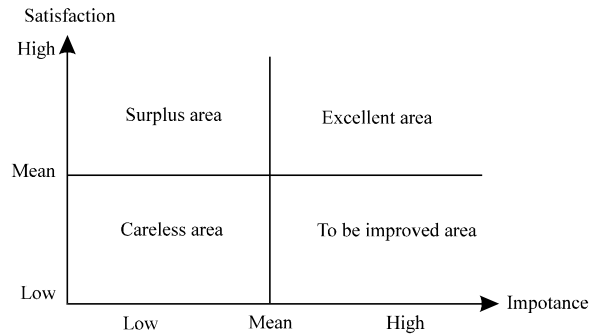


Fig. 1: I-S Model; Source: Yang (2003)

applies the theory; therefore a 5-point scale is adopted to evaluate the importance (I) and satisfaction (S) of each quality attribute. The indices of importance and satisfaction are defined as follows:

$$P_i = \frac{\bar{X}_i - \min}{5} \tag{1}$$

$$P_s = \frac{\bar{X}_s - \min}{5} \tag{2}$$

Where:

- $P_i$  = Index of importance
- $P_s$  = Index of satisfaction
- $\bar{X}_i$  = Mean of importance
- $\bar{X}_s$  = Mean of satisfaction
- min = The minimum value of the k scale
- R = The full range of the k scale = 5

Hung *et al.* (2003) and Lin *et al.* (2006) proposed the performance control matrix and adopted the ‘control chart’ of the Montgomery (1991) method. The performance matrix limits its range to the area within 2 bold lines to obtain the new ‘performance control matrix’ (Fig. 2). Using these indices, service-quality items are mapped onto the performance control matrix. The two bold diagonal lines in the performance matrix indicate the limits of the performance control zone (Zone A; ‘maintain zone’). Attributes within this zone can be maintained in accordance with the present situation. The limits of this zone are determined by the diagonal lines labelled as the ‘Performance Upper Control Limit’ (PUCL) and ‘Performance Lower Control Limit’ (PLCL), which are established according to the coordinates. The broken diagonal line represents the ‘Performance Control Cent Limit’ (PCCL). The values represented by these lines enable objective diagnosis of the situation and considered judgment of any improvements that are required.

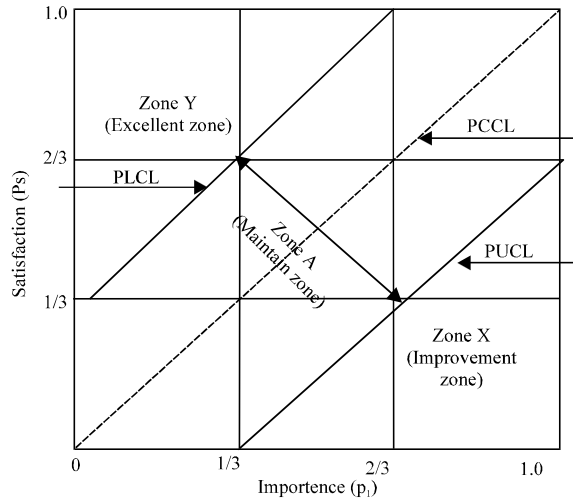


Fig. 2: Performance control matrix; Source: Chen *et al.* (2011)

In identifying items for improvement, managers need to attend only to items that are located outside the PUCL and PLCL control lines. Service-quality items that fall into the bottom-right zone (Zone X; ‘improvement zone’) have greater importance than satisfaction; quality attributes in this zone therefore require more resources to be invested to improve satisfaction. Conversely, items that fall into the upper-left zone (Zone Y; ‘excellent zone’) have less importance than satisfaction; quality items in this zone require fewer resources to be invested to prevent waste. Generally speaking, few items fall into the ‘excellent zone’ (Chen *et al.*, 2011).

Chen *et al.* (2011) proposed the Employees Satisfaction Index (ESI) can be represented by the weight-average as follows:

$$ESI_i = \bar{I}_i \bar{S}_i \tag{3}$$

Where:

- $\bar{I}_i$  = Mean of importance of *i*
- $\bar{S}_i$  = Mean of satisfaction of *i*

In order to raise the value of ESI, the firms have to take the improvement actions, although they cannot improve the performance for all the quality attributes. They might select some quality attributes that can result in more improvement effectiveness as the objective items, since they understand that the improvement effectiveness is based on the importance of the quality attribute and the related performance in improvement.

### EMPIRICAL STUDY

**Questionnaire design and structure:** Although many studies have utilized surveys of customers to assess satisfaction, few have used surveys of employees. The present study adopts the attitude that employees are ‘internal customers’ of the industry; as such, the study developed a questionnaire seeking data on employee satisfaction and employee perceptions of importance with respect to a series of quality attributes in hot spring industry. To assess employee satisfaction and perceptions of importance in any industry, the requirements of the employees must first be determined. Different industries have different business cultures and different employee requirements (Yang, 2003; Chen *et al.*, 2006). The present dimensions and questionnaire was therefore based on: (1) a review of the literature (Chen *et al.*, 2006, 2011); (2) discussions with five experts (including human resources management consultants) and discussions with 20 employees in hot spring industry. The final questionnaire was divided into the following three parts:

- **Demographics:** Gender, age, education degree and years of service
- **Importance survey:** Responses requested on a Likert-type scale of 1 to 5 (with 1 representing ‘extremely unimportant’ and 5 representing ‘extremely important’)
- **Satisfaction scale:** Responses requested on a Likert-type scale of 1 to 5 (with 1 representing ‘extremely dissatisfied’ and 5 representing ‘extremely satisfied’)

**Demographics of sample:** Taiwan is famous for its scenery as Formosa, even though the natural resources are limited. However, the hot spring is very famous in Taiwan among all of Asia. Shei-Pa National Park, located in Tai-An of Miao-Li County, ranks in the top ten most popular tourism sites; it is famous for its hot spring in Taiwan. The questionnaire was distributed randomly from January to March 2009 to all customers of the Tai-An hot spring industry in Taiwan. In all, 550 questionnaires were distributed and 342 were returned (a response rate of 62.18%). Among the returned questionnaires, 13 were incomplete and therefore discarded; this left a total of 329 questionnaires for analysis. The demographics of the final sample are shown in Table 1. The majority of respondents (56.53%) were female, and most (46.2%) were aged 30-39 years. Almost half (52.58%) had only completed college/university, but a little more than half (33.13%) had completed high school. The majority (48.32%) had been in their present employment from 4-10 years.

Table 1: Demographics of sample

Characteristics	Items	No.	Percentage
Gender	Male	143	43.46
	Female	186	56.53
Age	20-29	47	14.28
	30-39	152	46.20
	40-49	88	26.75
	50 and above	42	12.77
Education degree	Below junior high school	36	10.94
	High school	109	33.13
	College/University	173	52.58
	Master's level	11	3.34
Years of service	3 and below	113	34.34
	4-10	159	48.32
	11-20	49	14.89
	Above 20	8	2.43

Table 2: Survey results of I-S model

Items	Zones
Provision of an hygienic dining environment	Surplus area
Provision of a well-planned spatial working environment	Surplus area
Provision of a clean working environment	Surplus area
Provision of a safe and comfortable workplace	Excellent area
Provision of good salaries	To be improved area
Provision of job security	To be improved area
Provision of good retirement arrangement	To be improved area
Provision of lodging, travel, and welfare allowance	Surplus area
Provision of subsidy for further education and training	Surplus area
Provision of subsidy for meal and traffic leave requirement	Surplus area
Adequate arrangements to handle diverse annual leave requirement	Surplus area
Adequate arrangements for talent training	Surplus area
Provision of fair promotion system	To be improved area
Clear system of rewards and penalties	To be improved area
Directors with leadership and managerial capacity	Excellent area
Open system of directors' assignment	Surplus area
Provision of smooth communication channel	Excellent area
Provision of complete job pre-training for novice employees	Careless area
Provision of complete performance assessment system	To be improved area
Provision of flexible working system	To be improved area
Provision of a generous annual bonus	To be improved area
Adequate encouragement and care of employees	Excellent area
Fair distribution of operational profit	To be improved area
Provision of a timely encouragement bonus	Careless area
Employees encouraged to develop their own business vision	Surplus area
Instilling employees with confidence regarding the business	Surplus area
Competent management by CEO and senior executives	Careless area
Provision of a future development plan for the business	Careless area

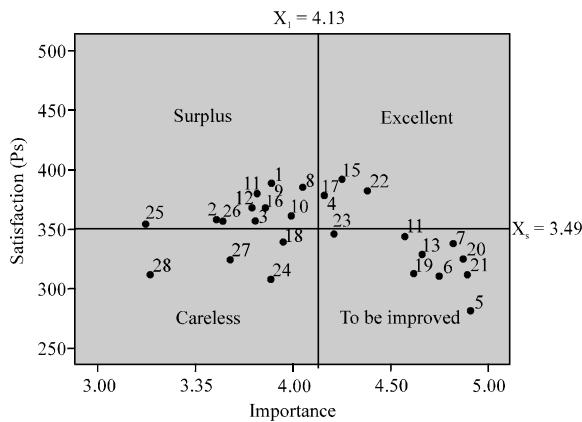


Fig. 3: I-S Model of case study

**Survey results of I-S model:** The average score for 'importance' across all 28 items was 4.13 and for 'satisfaction' was 3.49. Table 2 and Fig. 3 show the results for all 28 items in terms of the I-S Model. As shown in Table 2, only four attributes (items 4, 15, 17 and 22) fell into the 'excellent area' (high importance; high satisfaction). Nine attributes (items 5, 6, 7, 13, 14, 19, 20, 21 and 23) fell into the 'to-be-improved area' (high importance; low satisfaction). The majority of the attributes (11 in all) fell into the 'surplus area' (low importance; high satisfaction); these included items 1, 2, 3, 8, 9, 10, 11, 12, 16, 25 and 26. Finally, four attributes (items 18, 24, 27 and 28) fell into the 'careless area' (low importance; low satisfaction). According to Yang (2003), the attributes in the 'to be improved' area should take priority when undertaking improvement actions. The present study therefore finds that attributes 5, 6, 7, 13, 14, 19, 20, 21 and 23 require improvement to improve the firm's performance with respect to these items.

**Survey results of PCM:** The index of importance and index of satisfaction of the 28 items are shown in Table 3. These values were mapped into the PCM (Fig. 4). The

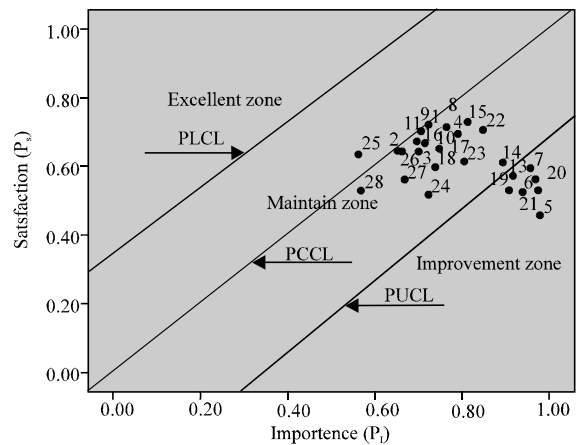


Fig. 4: PCM of case study

values outside PUCL and PLCL were located after drawing the control lines. No items were identified outside the PLCL; that is, no items fell into the 'excellent zone'. Items found outside PUCL were items 5, 6, 7, 13, 19, 20 and 21. This indicated that resources should be increased in these

Table 3: Survey results of PCM

$\bar{X}_i$	Ranking	$\bar{X}_s$	Ranking	$P_i$	$P_s$
3.89	17	3.88	3	0.723	0.720
3.61	26	3.58	12	0.653	0.645
3.81	22	3.57	13	0.703	0.643
4.06	13	3.79	7	0.765	0.698
4.91	1	2.82	28	0.978	0.455
4.75	5	3.11	26	0.938	0.528
4.82	4	3.38	19	0.955	0.595
4.05	14	3.85	4	0.763	0.713
3.89	18	3.89	2	0.723	0.723
3.99	15	3.61	11	0.748	0.653
3.82	21	3.80	6	0.705	0.700
3.79	23	3.68	9	0.698	0.670
4.66	6	3.29	20	0.915	0.573
4.57	8	3.44	17	0.893	0.610
4.25	10	3.92	1	0.813	0.730
3.86	20	3.67	10	0.715	0.668
4.16	12	3.78	8	0.790	0.695
3.95	16	3.39	18	0.738	0.598
4.62	7	3.13	23	0.905	0.533
4.87	3	3.24	21	0.968	0.560
4.89	2	3.12	24	0.973	0.530
4.38	9	3.82	5	0.845	0.705
4.21	11	3.46	16	0.803	0.615
3.89	19	3.08	27	0.723	0.520
3.25	28	3.54	15	0.563	0.635
3.64	25	3.57	14	0.660	0.643
3.68	24	3.24	22	0.670	0.560
3.27	27	3.12	25	0.568	0.530

items to promote employee satisfaction. Other items fell into the ‘maintain zone’, attributes within this zone can be maintained in accordance with the present situation.

**Integration of I-S Model and PCM:** The items were mapped into the I-S Model. This study discovered nine items located in ‘to be improved area’. For the items meaning they are importance level far exceed satisfaction level; should be priority improvement. Accordingly, the study found also 11 items located in ‘surplus area’, meaning they are satisfaction level far exceed importance level. The employees are very satisfied with the business offering management system. Furthermore, this indicated that are over invested and should be decreased to prevent waste. However, the I-S Model indicated these items were not listed in the items for improvement (Yang, 2003). If the persons surveyed in the study were VIP customers or high-ranking employees of this business, in order to maintain these important customers or employees, the correct practice would be to meet all their demands. Yet, if the persons surveyed were only general customers or employees, this practice would be discussed. Since these people do not quite make a profit to contribute to their enterprises. Businesses do not over invest in resources to improve satisfaction that causes resource waste.

The PCM was divided into three big performance zones, respectively ‘improvement zone’ ‘maintain zone’ and ‘excellent zone’. The items that fall into the ‘improvement zone’ demonstrate that importance is

greater than satisfaction; resources to be invested must increase to improve satisfaction. Therefore, the study discovered seven items located in the zone. The quality attributes which employees consider to be highly important and which have a lower satisfaction level are those that management needs to address as a first priority for improvements. When the items fall into ‘maintain zone’ it indicates that importance is equal to satisfaction. Therefore, generally speaking, a company adopts the management strategy can be maintained to the service quality of present situation.

**Calculating ESI to determine improvement priority:** From the perspective of service quality improvement, the I-S Model and PCM are excellent models. These models can meet the important demands and improve the satisfaction levels of customers and employees and encourage development of important level investigations. Yet, from the perspective of effective utilization of resources, the study shows the PCM can accomplish even more in the area of resource efficiency because of its role in enhancing resources to be invested that should be decreased to prevent waste. In this study, only determining improvement priorities were incorporated when both the I-S Model and PCM be met for important demands and improvements. Table 4 provides an integration of the findings from the I-S Model and the PCM for each item. In summary, this integration of the I-S Model and the PCM identified nine items (items 5, 6, 7, 13, 14, 19, 20, 21 and 23) as items of highest priority for improvement.

Generally speaking, if an organization possesses abundant resources, general improvement can be made; however, if resources are limited and only a few items can be improved, some items have to be selected as priorities (Chen *et al.*, 2006). For the above items, they should be a priority for improvement. Because the resources of most businesses are limited, the nine items cannot usually be improved simultaneously to the required level. It is necessary to determine priorities for improvement. Therefore, the study calculates ESI to determine improvement priority. The smaller the ESI, the greater the priorities to improve that quality attribute (Chen *et al.*, 2011). The ESI values as shown in Table 5. The quality attributes which employees consider being highly important and which have a lower satisfaction level are those that management needs to address as a first priority for improvements. The study applies ESI to determine improvement priority as follows:

- Clear system of rewards and penalties
- Provision of good salaries
- Provision of complete performance assessment system

Table 4: Comparison of I-S Model and PCM

I-S Model	PCM
Surplus area	Maintain zone
Surplus area	Maintain zone
Surplus area	Maintain zone
Excellent area	Maintain zone
To be improved area	Improvement zone
To be improved area	Improvement zone
To be improved area	Improvement zone
Surplus area	Maintain zone
Surplus area	Maintain zone
Surplus area	Maintain zone
Surplus area	Maintain zone
To be improved area	Improvement zone
To be improved area	Maintain zone
Excellent area	Maintain zone
Surplus area	Maintain zone
Excellent area	Maintain zone
Careless area	Maintain zone
To be improved area	Improvement zone
To be improved area	Improvement zone
To be improved area	Improvement zone
Excellent area	Maintain zone
To be improved area	Maintain zone
Careless area	Maintain zone
Surplus area	Maintain zone
Surplus area	Maintain zone
Careless area	Maintain zone
Careless area	Maintain zone

Table 5: Improvement priority of ESI

Items	ESI	Priority
Clear system of rewards and penalties	11.98	1
Provision of good salaries	13.84	2
Provision of complete performance assessment system	14.46	3
Provision of job security	14.77	4
Provision of a generous annual bonus	15.25	5
Provision of fair promotion system	15.33	6
Fair distribution of operational profit	15.72	7
Provision of flexible working system	15.77	8
Provision of good retirement arrangement	16.29	9

- Provision of job security
- Provision of a generous annual bonus
- Provision of fair promotion system
- Fair distribution of operational profit
- Provision of flexible working system
- Provision of good retirement arrangement

**CONCLUSIONS**

Several quality-improvement models have been developed to enable service providers to improve deficiencies in the service quality they offer. However, most models have relied solely on assessments of satisfaction with particular items and have thus failed to take into account the relative importance of various quality attributes in shaping perceptions of satisfaction. This causes difficulties for providers in assessing priorities for improvement. The present study has addressed this deficiency by integrating the I-S Model

and the PCM of to provide a more comprehensive assessment model for improving specific quality attributes. The study has applied this integrated measuring instrument in Taiwanese hot spring industry using a questionnaire survey of employees to assess ‘importance’ and ‘satisfaction’ in their capacity as ‘internal customers’ of the industry.

Using this methodology, the study has identified nine items as being of first priority for improvement. These findings are significant for service providers because they take into account: (1) the relative importance of quality attributes; (2) the relative satisfaction level of these attributes and (3) the resources available for improvement. Business resources are always limited, and providers must therefore devise appropriate improvement strategies to improve service quality while containing costs and thus ensuring a viable competitive advantage. The present study has demonstrated that the I-S Model and the PCM, taken together, provide an excellent measuring instrument for assessing priorities for quality improvement.

**ACKNOWLEDGMENTS**

The author would like to thank the National Science Council in Taiwan, for financially supporting this study in 2009 (Number: NSC 98-2218-E-243-001).

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