Two-Factor Model
a Proposed Model for Service Quality Management

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Abstract

This study develops a new model called two-factor model to help management of service organizations to identify critical areas for quality improvement efforts. Facing many critiques in terms of validity, reliability, dimensionality, and especially in terms of managerial implication, the popular Servqual model is not fit for service quality measurement anymore. The new model measures two factors, attributes perceived performance and a benefit factor reflecting the impact on customer shopping behavior, and also provides a framework to quantify and to visualize the relationship of these two sets of measurements in order to help management predict the incremental benefit of a firm associated with performance improvement of each specific quality attribute.

I. INTRODUCTION

Although many textbooks introduce Servqual as a popular mothod to measure service quality, it faces a lot of criticisms in literature as well as empirical testing. In addition, its managerial implication is also challenged. Therefore, an alternative model is designed. As Servqual, the proposed two-factor model is also a multi-attribute model, which provides more insight to managers and researchers than an overall effect model [1]. Before developing the new model, Servqual method is reviewed.

II. SERVQUAL METHOD

The Servqual method is based on the gap theory of Parasuraman, Zeithaml, and Berry [2], which suggests that the difference between customers' perception of the performance of a specific firm within a general class of service providers and their expectation about the performance of that class (P-E gap) drives the perception of service quality.

In its original format, the Servqual instrument consists of 22 attributes which can be classified into five dimensions: tangibility, reliability, responsiveness, assurance, and empathy [3].

The questionnaire used in Servqual includes 22 pairs of questions designed to capture the perception of customer about their expectation toward 22 attributes of a service and their perceived performance of these attributes. These pairs of question have the same format according to Parasuraman, Berry, and Zeithaml [4]:

- Expectation (E): excellent company will have "attribute 1" (attribute 2, 3, .., 22).
- Perceived performance (P): XYZ company has "attribute 1" (attribute 2, 3, .., 22).

From the responses of this questionnaire, the perceived quality of each attribute is computed as the gap between P and E. The application of Servqual in service quality management is based on the assumption that the larger the P-E gap is, the more critical the improvement is.

Although widely accepted, Servqual faces many critiques. The suggestions of various authors are taken into account for constructing the two-factor model.

1. Reliability and dimensionality of five-dimension structure

The reliability tests of Cronin and Taylor [5] in four industries (banks, pest control, dry cleaning, and fast food) proved that the five-dimension structure of Servqual is not confirmed in any of the research samples. In addition, the dimensional test indicates that 22 attributes are unidimensional or they are considered as one composite of individual measures. Five-dimension structure of Servqual has a conceptual meaning rather than a framework to design a practical research.

From their testing results, Cronin and Taylor suggested that the dimensional structure of quality measures and quality attributes should be constructed flexibly according to specific industry.

Hence, using interview or focus group to explore quality attributes may be a flexible alternative in which the characteristics of a product or service are reflected more specifically.

2. Validity of Servqual measures

The primary threat to validity of Servqual measures is construction validity. The validity test of Cronin and Taylor [5] suggested that the performance-based measures provide a more construction-valid explication of service quality than Servqual measures because of their content validity. In addition, the findings of Teas [6] empirical test proved that the evaluated performance measurement framework is characterized by higher validity than the P-E framework.

It is suggested that the performance measure should be used instead of P-E gap in quality measurement.

3. Managerial implication

The use of Servqual method implies that the improvement of an attribute which has bigger P-E gap will provide more benefits than improvement of an attribute which has smaller P-E gap so the former has higher priority to improve.

"Does the large P-E gap indicate the necessity for improvement?" is the question of Servqual. The new model mainly aims to address and resolve this problem.

III. THE TWO-FACTOR MODEL

As the suggestions of Cronin, Taylor, and Teas above, performance measure is used instead of P-E gap in the new model. In addition, the two-factor model attempts to link performance measure with benefits of the firm such as shopping preference, buying intention, customer loyalty, etc. The purpose is to identify critical areas for improvement efforts based on the incremental relationship between perceived performance and the firm's benefits.

The idea comes from the quality concept of JIS (Japanese Industrial Standards) Z8101, quality is defined as "the totality of quality characteristics, or level of performance, that determines whether a product or service satisfies the purpose of use" [7]. It is easy to agree that customer satisfaction has positive relationships with

customer loyalty, purchase intention, and shopping preference, which are the benefits of the firm [8] but "how strong are these relationships?" is a difficult question to answer. To bypass this question, we should go further by replacing satisfaction factor with one of the firm's benefits.

The two-factor model visualizes the relationship of performance measure and a benefit factor through characteristic curves and quantifies this relationship incrementally through two coefficients.

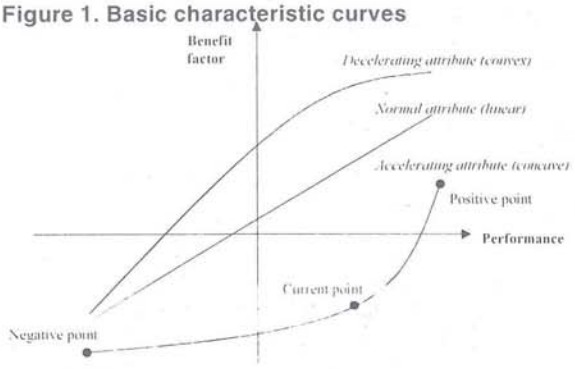
1. Characteristic curve

In the two-factor model, each attribute is presented as a *characteristic curve* in two-dimensional co-ordinates (Figure 1). The horizontal axis represents perceived performance of an attribute and the vertical axis represents the benefit contributed by this performance.

First, it is assumed that the characteristic curve has positive slope and there are three basic shapes: convex curve, straight line (linear), and concave curve. These assumptions are based on three kinds of attribute (must-be, one-dimensional, and attractive) in Kano model [9]. Later, these assumptions will be investigated and discussed at the end of this section to achieve wider applications. To determine the shape of the curve, given three basic shapes, three points are needed including two extreme points and one in the middle. Information of these three points comes from two surveys (Figure 2):

Survey A is used to measure the firm's benefit contributed by two extreme performance of each attribute, the expected ideal and worst performances. From the response of survey A, two extreme points are determined, namely positive point and negative point (Figure 1), respectively. For this purpose, the questionnaire of this survey consists of pairs of one extremely positive question and one extremely negative question.

Figure 1. Basic characteristic curves



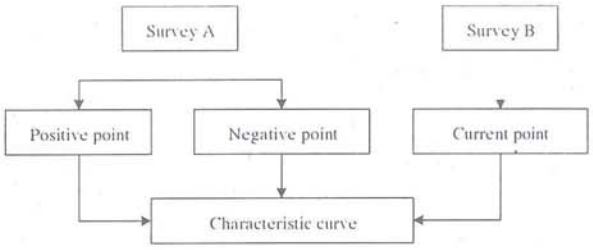


Figure 2. The use of two surveys

Survey B is used to measure perceived performance of each attribute of the service under study and the firm's benefit contributed by this performance. Current point (Figure 1) comes from the response of survey B. The questionnaire of this survey is constructed by two sets of questions, one for perceived performance and one for benefit contributed by this performance.

The characteristics of an attribute could be derived from the characteristic curve (Figure 1), described as follows:

- If the shape of the characteristic curve is close to a straight line, equal increment in perceived performance will result in equal increment in benefit factor. This kind of attribute is called *normal attribute*.
- If the characteristic curve is convex, the speed of increment in benefit will decelerate when perceived performance increases. This kind of attribute is called *benefit-decelerating attribute*. These attributes are essential. However, when achieving the threshold it is not necessary to improve.
- If the characteristic curve is concave, the speed of increment in benefit will accelerate when perceived performance increases. This kind of attribute is called *benefit-accelerating attribute*. The absence of these attributes does not affect the firm's benefits negatively but having them makes customer delighted then increases the benefits sharply.

The steeper the curve is, the more the benefit factor is sensitive to performance improvement.

In short, the characteristic curve determines the relationship between a benefit factor and a specific attribute's performance in an incremental fashion. It can be used to uncover the behavior of the benefit factor when a specific attribute's performance fluctuates.

2. Two-factor model's coefficients

In addition to using the characteristic curve to represent the relationship between perceived performance and its benefit to a firm, the proposed model can also quantify this relationship using two coefficients:

Benefit gap is used to measure the potential improvement of benefit factor which can be achieved by improving an attribute's performance. The larger the benefit gap is, the more benefit the firm can gain if the attribute's performance increases to ideal performance.

$$\text{Benefit gap} = \text{benefit factor}_{\text{ideal performance}} - \text{benefit factor}_{\text{current performance}}$$

Improvement efficiency is used to measure the efficiency of improvement of the firm's benefit caused by improving an attribute's performance. It is the average angular coefficient of characteristic curve from current point to positive point. This coefficient indicates the improvement priorities of attributes. The higher the improvement efficiency is, the more benefit the firm gains by improving a certain amount of the attribute performance.

These coefficients and their relationships are illustrated in figure 3.

$$\text{Improvenment efficiency} = \frac{\text{Benefit gap}}{\text{Performance gap}}$$

In conclusion, the higher the improvement efficiency is the higher the priority for performance improvement the attribute has. In addition, attributes which have low improvement efficiencies but high benefit gaps are reserved sources for improvement when all of the high efficient attributes reach their potentials.

3. Relaxing the assumptions

The proposed model is based on the two basic assumptions. As these assumptions may limit the model's applications, the probability of relaxing these assumptions and its applications is investigated.

All attributes are positive. This assumption could be achieved by properly formulating attribute or converting the measurement scale in case of negative attribute.

There are three basic shapes of characteristic curve: convex curve, straight line (linear), and concave curve. This assumption is not always true. The characteristic curve could turn from convexity to concavity in case benefit factor is more sensitive to extreme performances and vice versa (Figure 4). In both cases, the formulated characteristic curve would deviate from the "true" one. However, the improvement efficiency and benefit gap do not deviate from the "true" ones because they derive from current point and positive point, not the shape of the curve. Hence, the priorities for improvement based on improvement efficiency and benefit gap are not affected by these deviations.

IV. APPLICATION TO HCMC-BASED SUPERMARKETS

In this study, shopping preference of customers is used for illustration but other benefit factors may be used as well.

Figure 3. two-factor model's coefficients

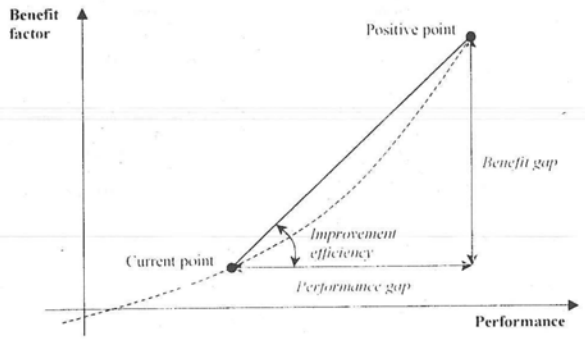
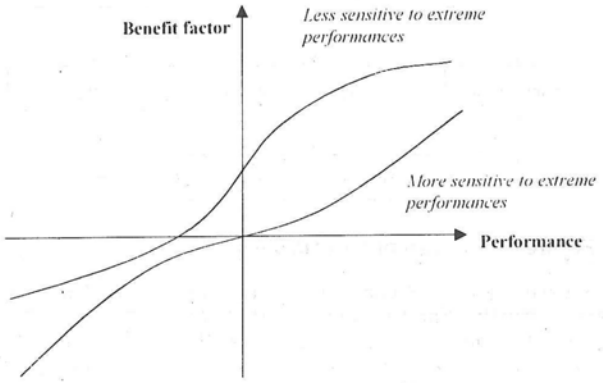


Figure 4. Two other shapes of characteristic curve



1. Methodology

Quality attributes of supermarket are generated by conducting unstructured interviews. The list of 62 attributes was reduced by a focus group discussion. Finally, the list of studied attributes was completed with 23 items.

The scale used in this research is from –3 (strongly disagree) to 3 (strongly agree).

The sample size of survey A was 320 (N_A= 320). This survey was conducted in 8 randomly chosen supermarkets in HCMC. The sample size of survey B was 350 but there were only 302 responses (N_B= 302). This survey was conducted in the studied supermarket. Based on the average distribution of customer checkout, the interviews were conducted to increase the representative property of the sample. A pre-determined procedure to choose interviewees was also established to eliminate personal preferences of field interviewers, which are potential sources of biases.

2. Analysis

For the illustration of the differences between the two-factor model and Servqual method, three representative attributes are analysed. Their preference gaps (benefit gaps) and improvement efficiencies are shown in table 1. Other attributes are presented in the appendix.

Among these three attributes, "quality of products" has the highest priority for improvement based on the highest improvement efficiency. The next is "unique products" and the last is "convenience of open hours". These priorities are also illustrated in the figure 5 in terms of the angular co-efficient of characteristic curves from current point to positive point.

As illustrated in figure 5, "quality of products" is a normal attribute, in which shopping preference of customers is influenced symmetrically by the attribute's performance. The better the quality of products, the more shopping preference is and vice versa.

Differently, "unique products which cannot be found in other stores" is an accelerating attribute. Shopping preference of customer becomes more and more sensitive to this attribute when performance increases. From the current level of "unique products" to none, the shopping preference of customers is nearly the same. However, the improvement in this attribute affects shopping preference

Table 1. Coefficients

Priority	Attributes	Preference Gap	Improvement Efficiency
1	Quality of products	1.32	1.07
2	Unique products	1.35	0.54
3	Convenience of open hours	0.52	0.31

The differences are significant at 0.00 (except the difference between preference gaps of the first two attributes) in Monte Carlo simulation (sample size is 10,000).

of customers positively at an accelerated rate.

In contrast, "convenience of open hours" is a decelerating attribute. Shopping preference of customers becomes less and less sensitive to this attribute when performance increases. The extension of "open hours" will not improve the shopping preference of customers significantly. However, lessening the "open hours" will reduce the shopping preference significantly.

The analysis of these attributes shows that the characteristic curves vary in terms of convexity and steepness. Characteristic curves of other attributes also confirm this fact (not provided in this paper). Hence, the performance gap alone in cases of Servqual cannot identify the necessity for quality improvement. Figure 5 shows that the attribute which has large performance gap is not always the one which contribute significantly to shopping preference when improving. For example, the performance gap of "open hours" is larger than that of "quality of products" but the improvement of the later will increase the shopping preference of customers more significantly.

V. CONCLUSION

This study attempted to develop an alternative to the traditional Servqual approach in service quality management in order to identify critical areas for improvement efforts. It can be concluded that the performance itself is just a quality measure but cannot identify the areas for improvement. The bottom line is that the benefit and the identification of improvement efforts must be based on incremental fashion. Hence, the incremental relationship between performance and a benefit factor (e.g. shopping preference of customers) should be studied to highlight the critical areas.

In addition, in order to sufficiently identify the priorities for quality improvement, the two-factor model can provide predictive information to management on how shopping preference of customers (or other benefit factors) will react when a specific attribute's performance fluctuates.

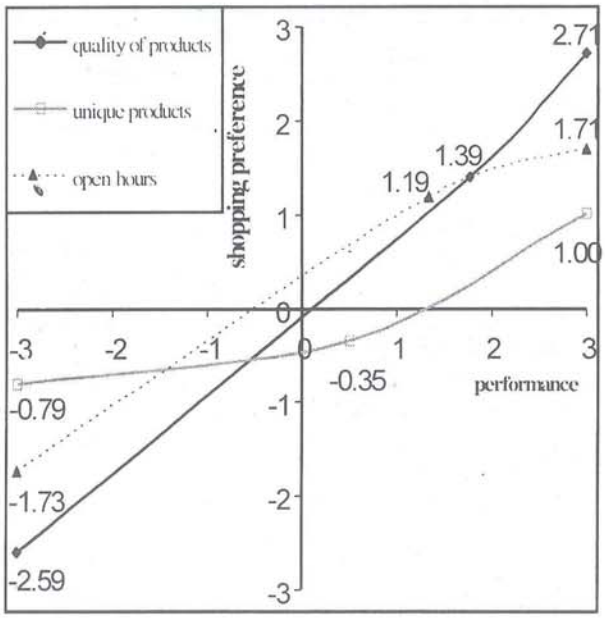
Since quality improvement now has a direct effect on shopping preference of customers toward services, using the two-factor model could be more beneficial to managers, who are concerned with the firm's benefits, as well as to improve quality.

However, it is presumptuous to conclude that two-factor model is better than other models which were well developed over many years. It is introduced as a new approach rather than a superior model. Moreover, it also has some limitations:§

The accuracy of improvement efficiency: The improvement efficiency is the average angular coefficient of characteristic curve from current point to positive point. Therefore, it does not determine exactly the efficiency of performance improvement at current point but the average. If the attribute's performance does not improve greatly to the ideal performance, this coefficient will be less accurate. In addition, the more convex (or concave) the curve is (from current point to positive point), the less accurate the improvement efficiency is because the convexity leads to the variety of angular coefficient from current point to positive point. If the characteristic curve is degenerated to be a straight line, improvement efficiency will be absolutely accurate. In short, improvement efficiency is an accurate coefficient when the attribute performance improves greatly to the ideal performance or when the convexity is not so significant. Otherwise it should be considered as an approximate coefficient.§

The need of two surveys: It is the price for the quality and quantity of information. However, survey A could be reused for other research of the same kind of service.

Figure 5: Characteristic curves of 3 representative attributes



REFERENCES

[1] Wilkie, W.L. and Pessemier, E.A., "Issues in Marketing's Use of Multi-Attribute Attitude Models", Journal of Marketing Research, Vol. X, pp.428-441 (1973).

[2] Parasuraman, A., Zeithaml, V., and Berry, L., "A Conceptual Model of Service Quality and Its Implications for Future Research", Journal of Marketing, Vol. 49 (Fall), pp. 41-50 (1985).

[3] Parasuraman, A., Zeithaml, V., and Berry, L., "Servqual: A Multiple-Item Scale for Measuring Customer Perceptions of Service Quality", Journal of Retailing, Vol. 64, pp. 12-40 (1988).

[4] Parasuraman, A., Zeithaml, V., and Berry, L., "Refinement and Reassessment of the Servqual Scale", Journal of Retailing. 67 (Winter), pp. 420-450 (1991).

[5] Cronin, J.J., Taylor, S.A., "Measuring Service Quality: A Reexamination and Extension", Journal of Marketing, Vol. 56, pp. 55-68 (1992).

[6] Teas, R.K., "Expectation, Performance Evaluation, and Consumers' Perception of Quality", Journal of Marketing, Vol. 57, pp. 18-34 (1993).

[7] Kano, N., Guide to TQM in Service Industries, Asian Productivity Organization, Tokyo (1996).

[8] Anderson, E.W., Fornell, C., and Lehmann, D.R., "Customer Satisfaction, Market Share, and Profitability: Findings From Sweden", Journal of Marketing, Vol. 58, p.53-66 (1994).

[9] Rao, A., Carr, L.P., Dambolena, I., Kopp, R.J., Martin, J., Rafii, F., Schlesinger, P.F., Total Quality Management: A Cross Functional Perspective, John Wiley & Sons, Inc., U.S.A (1996).