A Service Quality Diagnosis Model for Supermarkets

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Abstract

Perceived service quality was viewed as the degree and direction ofdiscrepancy between consumers’ perceptions and expectations. However, the existing procedure of data collection is less desirable because respondents attempt to recall theirexpectationsafter receiving service instead of before receiving service. Thisstudy introduce a two-stage service quality diagnosis model for re-exploring the gap between consumers’ perceptions and expectations with a more reliable data collection method.Based on analysis results, gaps are further classified into three categories: ideal quality, unacceptable quality, and dynamic satisfactory quality.Aservice sector of a supermarket is selected for validating the proposed model with structural equation models. The proposed diagnosis model serves as a business diagnosis, which can effectively assist practitioners in discovering current service quality problems and provide solutions to problems or strategies for continuous improvement.

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建構服務品質診斷模式：以生鮮超市爲例

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摘　要

　　服務品質認知差異主要探討顧客事前期望服務與事後知覺服務之間所形成的認知差異。目前服務品質認知差異的研究方法，在研究程序上是等待顧客全然接受服務後，才同時填寫事前期望服務與事後知覺服務之問卷，然而研究結果卻無法有效顯著區分其所定義缺口之差異，即把知覺服務品質區分為：滿意、普通與不滿意等三類。因此，本文以不同的研究過程，並在所建構的『服務品質診斷模式』下，藉由生鮮超市為實證對象，重新探討服務品質知覺缺口。本模式第一階段為發展並驗證適合生鮮超市服務品質的關鍵服務因素與量表。第二階段依此量表持續探討個案超市的服務品質，以不同於先前學者的問卷法則，探討求診者的事前期望服務與事後服務知覺的差異，成功地把知覺服務品質區分為三類。且如同企業診斷般，有效協助業者發掘目前服務品質的異常現象，進而建議及時解決問題或持續改善之對策。

關鍵詞：服務品質、探索性因素分析、驗證性因素分析、結構方程模型、生鮮超市。

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1. Introduction

A supermarket is regarded as a product of business development, progressive society, and urbanization. With the continuous growth of economy and consumer income, consumer demand for supermarket services has evolved. In response to market changes, a supermarket's operation pattern has become increasingly diversified.

The evolution of supermarket gradually impacts consumer's purchase behaviors, which in traditional markets motivate the consumer to choose a new trading place for shopping. Although the traditional public market allows customers to hunt for a bargain, readily presents bonuses, and offers a friendlier shopping atmosphere, a supermarket's business scale is considerably larger. This allows supermarkets to reduce operational cost, provide one-stop shopping, and enjoy economies of scale. Further, compared with the traditional market, a supermarket offers the advantages of air-conditioning, a clean shopping place, and convenient parking. Perhaps the most important advantages of supermarkets are the wide variety of merchandise, competitive pricing, and 24-hour operations.

Although the supermarket is an indispensable venue for shopping, practitioners should closely ascertain if service quality could fully satisfy customers' demands. What are the key service factors expected by customers? How do practitioners measure the existing service quality level? What are the abnormalities in existing service quality? In this study, these issues will be explored.

Service quality has been broadly discussed since Parasuraman, Zeithaml, and Berry (1985) introduced the conceptual model aptly dubbed "PZB model". Parasuraman, *et al.* (1988) conducted follow-up empirical research to validate the model by developing SERVQUAL, an instrument which measures consumers' perception of service quality. Perceived service quality was viewed as the degree and direction of discrepancy between consumers' perceptions and expectations. Since then, the PZB model and SERVQUAL have been widely applied by many scholars (Yang and Jun, 2002; Naik *et al.*, 2010; Chen *et al.*, 2010; Liao, 2011; Chiou *et al.*, 2012) in various service sectors. These studies attempted to discuss the theoretical aspects of service quality, validate proposed models, or explore the extended issues of service quality from a behavioral science perspective.

The SERVQUAL methodology was designed to create a comparison between what consumers feel service firms should

offer (expectations) and their perceptions of performance of firms providing the services. The survey component of SERVQUAL was distributed among respondents who had used the service in question within the past three months. Respondents were asked to express both expectations and perception of a firm within one instrument. In comparative terms, there was not considered as a "before" and "after" administration.

From a practical standpoint, the procedure is even less desirable as the expectation responses can be of little value (Carman 1990). When respondents express their expectations of firms offering services, they attempt to recall their experience. Thus, the level of expectations will be influenced by the service experience to a certain extent. On the other hand, it is reasonable to believe that perceptions of service quality are influenced by the pair comparison of prior expectation due to a contrast effect. Thus, the logic of SERVQUAL methodology can be further addressed.

Asking a respondent's expectation and perception after receiving service is akin to evaluating the result of taking diet pills without measuring a participant's starting weight. In this context, the participant can merely guess his starting weight, rendering impossible the precise measurement of

weight loss during the diet medication period. Thus, a respondent's ex-post expectation is rather affected by a firm's service experience. At the time of completing the expectations battery, respondents held expectations; however, these may not be based on experience (Carman 1990). The difference between ex-ante (before receiving service) and ex-post (after receiving service) expectations will cause research results to be less desirable. Moreover, expectation is an abstract behavioral intention in social science which cannot be measured as a physical object. All these lead to an important point wherein the ex-ante expectation is reasonably expected to reduce relative difference between a measurement value and a candid value.

The main purpose of this study is to construct a service quality diagnosis model for re-exploring the fifth gap of the service quality model proposed by Parasuraman *et al.* (1985). This empirical study of a supermarket case is conducted in two stages. The first stage involves identifying key service quality factors through an exploratory factor analysis (EFA) of supermarkets. With the identified factors, a second survey is conducted to verify the reliability and validity of the proposed model and scale through confirmation factor analysis (CFA). The second stage is

aimed at discussing consumer expectation before receiving service and perception after receiving service. Based on analysis results, gaps are further classified into three categories: ideal quality, unacceptable quality, and dynamic satisfactory quality. The proposed diagnosis model serves as a business diagnosis, which can effectively assist practitioners in discovering current service quality problems and provide solutions to problems or strategies for continuous improvement.

2. Literature Review

2.1 Service quality

As the nature of service is intangible, heterogeneous and inseparable, Bitner *et al.* (1994) defined service quality as "the consumer's overall impression of the relative inferiority/superiority of the organization and its services". Roest and Pieters (1997) asserted that service quality is a relativistic and cognitive discrepancy between experience-based norms and performances concerning service benefits. Lovelock and Wirtz (2007) claimed that service quality pertains to the customer's overall experience in receiving service processes.

How must service quality be measured? The question is among the most recurrent topics in management and marketing literature (Martínez, 2010). Several service quality models have been proposed and widely tested in applied research. Grönroos'(1978) service quality model was the first attempt to evaluate service quality. This author claimed that the quality of the service is dependent on expected service and perceived service. Expected service quality is recognized from word of mouth, corporate image, advertising, pricing or personal factors, whereas perceived quality is the result of consumer's view of a bundle of service dimensions. Throughout the years, other important researchers introduced their own models to measure service quality (e.g. Parasuraman *et al.*, 1985, 1988, 1994; Carman 1990; Cronin and Taylor, 1992; Dabholkar *et al.*,1996; Brady and Cronin, 2001; Anja and Richard, 2005).

From a common feature viewpoint, researchers proposed a multidimensional service quality conceptualization that it is inherently linked to the measurement of consumer quality perceptions. In other word, service quality models offer a framework for understanding what service quality is, as well as how to measure service quality in each proposed conceptualization (Martínez, 2010).

One of the pioneer works in the retailing field is that by Carman (1990). Its application to retailers concluded, using

principal axis factor analysis followed by oblique rotation that the five dimensions of the SERVQUAL instrument were not generic, suggesting adding new attributes or factors. Finn and Lamb (1991) developed a research work based on department stores and discount stores. Their confirmatory factor analysis was unable to obtain a good fit to the SERVQUAL instrument for either of these commercial formats.

Vazquez *et al.* (2001) proposed a retail service quality scale which was developed from the literature review and both a qualitative and a descriptive research carried out in supermarket stores. Based on the results of this study it appears that these 18 attributes can be broken down into four basic service quality dimensions: physical aspects, reliability, personal interaction and policies.

Chen (2011) explored an integrated retail service quality and found four main factors affecting the quality of services: caring, physical entities, location, and competition. Particularly, caring is considered as the most important leading indicator of service quality by consumers.

2.2 Development of service quality constructs

Various constructs of service quality are available in existing literature, but the most well-known research was introduced by Parasuraman *et al.* (1985). The said study identified four service sectors—retail banking, credit card, securities brokerage, and product repair and maintenance—for conducting an exploratory investigation. Following in-depth interviews with executives in nationally recognized service firms and a set of focus group interviews with consumers, Parasuraman *et al.* (1985) identified 10 constructs fundamentally used by consumers to evaluate service quality. To assess customer perception of service quality in service and retail organizations, Parasuraman *et al.* (1988) employed eleven steps to develop the service quality scale (SERVQUAL). The scale included a 22-item instrument, and it refined the original ten constructs into five dimensions. The scale consists of the following dimensions (Parasuraman *et al.*, 1988):

1. ''Tangibles'' which include the physical facilities, equipment, and appearance of personnel.

2. ''Reliability'' which reflects the ability to perform the promised service dependably and accurately.

3. ''Responsiveness'' which include the willingness to help customers and provide prompt service.

4. ''Assurance'' which is an indication of the knowledge and courtesy of employees and their ability to inspire

trust and confidence; and

5. "Empathy" which includes caring and individualized attention that the service firm provides to its customers.

This instrument was subsequently employed to measure service quality by comparing the difference between customer expectation and perceived service.

Though SERVQUAL is viewed by many as a superior instrument for measuring service quality, several scholars challenged the methodology, variable definition, data collection procedures, and application of Parasuraman *et al.*'s works (1985, 1988). For example, Carman (1990), Finn and Lamb (1991), Babakus and Boller (1992), and Triplet *et al.* (1994) applied the SERVQUAL scale to measure service quality, but their research findings failed to attain a consistent construct. Cronin and Taylor (1992) pointed out that the SERVQUAL scale focused on the results without allowing for the survey process. Thus, respondents were often confused when they answered the expectations and perceptions of a received service at the same time. To address this problem, they developed the SERVPERF scale, a tool for directly measuring perceived service quality. Carman (1990) suggested that when adopting the development process of the SERVQUAL scale, the researcher should redesign questionnaires of ten

constructs based on the selected service sectors to attain more desirable measurement results.

2.3 Service quality measurement model

The PZB model incorporates customer's psychological, perceptual, and social factors with the executive's perceptual and business internal operational factors. In particular, the model established a crucial basis for the latter's service quality research.

The foundation of this model is the set of five gaps. The first four gaps are related to the service marketer's side. The fifth gap, meanwhile, is a consumer perceived service which is determined by the magnitude and direction of the gap between expected and perceived service. In other words, service quality as perceived by the consumer is a function of the first four gaps, which are associated with the design, marketing, and delivery of services. In turn, a consumer's perception of service quality depends on the nature of the discrepancy between expected service (ES) and perceived service (PS). As ES < PS, perceived quality is more than satisfactory and it will tend towards ideal quality. As ES = PS, perceived quality is satisfactory. As ES > PS, perceived quality is completely unacceptable; specifically, the

firm does not possess any competitive advantage.

3. Methodology

The main purpose of this study is to develop a service quality diagnosis model which can aid practitioners in discovering the abnormal phenomena of service quality, thus ultimately providing suggestions for improvement. To achieve this, a service quality diagnosis model is developed by extending the PZB model.

A service sector of a supermarket is selected for validating the proposed model. To develop a service quality scale of a supermarket, a focus group comprising supermarket senior managers and academic scholars is formed; this group is tasked to review and confirm if questionnaires are pertinent for measuring service quality in the supermarket business. Lastly, the consumer's expected and perceived service are collected and survey data are analyzed to further interpret the meaning of different service quality gaps.

3.1 Service quality diagnosis model

This study extends the PZB model and focuses on the fifth gap between expected service and perceived service. A two-stage service quality diagnosis model is introduced, as shown in Figure 1. The model illustrates a method for diagnosing a firm's service quality.

Stage one involves developing key service quality factors and scale. In stage two, the consumer's expected service and perceived service are measured for further testing and analyzing service quality gap. Details of each stage will be discussed in the following sections.

3.2 Stage one: Developing key service quality factors and scale

Three steps are involved in stage one for developing key service factors and scale. First, an initial service quality questionnaire is developed based on literature review and suggestions of the focus group. Second, an EFA is conducted from the customer's viewpoint to identify key service quality factors; an initial scale was developed. Third, a CFA is conducted to verify the scale's reliability and validity.
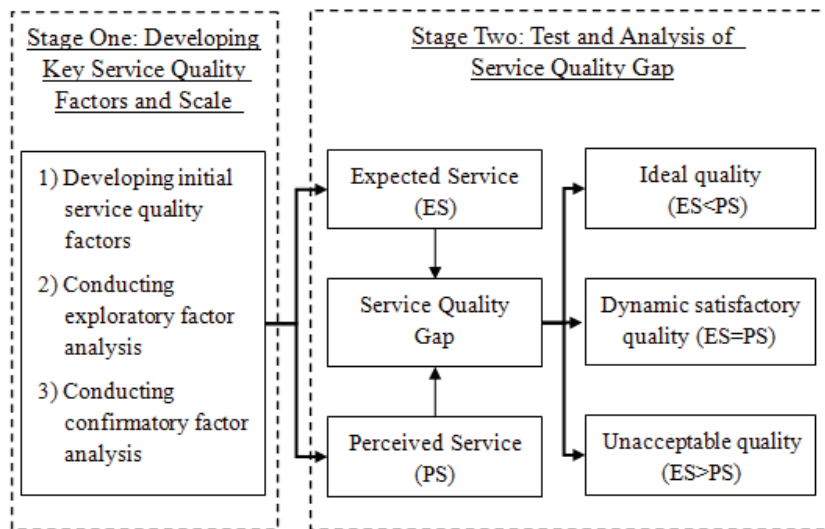
Fig. 1. Service quality diagnosis model.

Step 1: Developing initial service quality factors

The basis for initial supermarket service quality factor was developed based on SERVQUAL. Further, existing research on evaluating retailing's service quality (Bowers *et al.* 1994; Williams 1998) were tapped for including more relevant factors of supermarkets. As a result, the initial 40 service quality factors were selected. These initial factors were reviewed by a focus group for screening out irrelevant items. The focus group includes two supermarket senior managers and three academic scholars. In the end, four items were excluded and 36 items were retained in the initial factors for evaluating a supermarket's service quality.

Step 2: Conducting exploratory factor analysis

The purpose of EFA is to explore key service factors (KSF) and service quality constructs extracted from a survey of a supermarket's service quality. To enhance the validity of research, respondents of this survey were selected through purposive sampling; this targeted consumers who have shopped at the supermarket. The questionnaire was designed using a five-point Likert scale ranging from "1" (least important) to "5" (very important). Once data was collected, an item analysis was initially conducted to ensure each item's discriminant power by the criterion of internal consistency. If an item's discriminant power fails to attain the significant level of 0.05, it should be removed from the list. Moreover, when the Pearson correlation

between an item score and total score is insignificant, it should be removed as well. Subsequently, reliability of each item is tested by communality value. When an item's communality is less than 0.5, it fails the reliability test and should be removed. Following item analysis and reliability test, the remaining items are tested by factor analysis to classify each into corresponding constructs. As suggested by Hair *et al.* (2006), two items' double loading should be greater than 0.5; otherwise, the items must be removed from the list.

Step 3: Conducting confirmatory factor analysis

To verify reliability and validity of the scale developed after EFA, a service quality survey is conducted once more. The questionnaire retained the five-point Likert scale ranging from "1" (least important) to "5" (very important). Subjects were randomly selected from customers who shopped at one of three selected supermarkets, which were similar in business scale. Once data was collected, a validity test and item analysis was conducted to eliminate irrelevant items.

CFA is employed to assess the number of factors and loading of variables by focusing on measurement and structural models. The measurement model describes how the latent variable is measured in terms of the observed variables; it describes the measurement properties of these variables. It attempts to clarify the following two questions: (1) Can the model's measuring variables correctly gauge the latent variables while taking an overall model into consideration? (2) Does factor loading exist among different factors' measuring variables? In comparative terms, the model's convergent and discriminant validity is tested.

As suggested by Bagozzi and Yi (1981) and Fornell and Larcker (1981), the most widely employed indices of convergent validity include individual item reliability, composite reliability, and average variance extracted. Fornell and Larcker (1981) suggested that the acceptable level of composite reliability is 0.6 or above for a construct. Another reliability measure, average variance extracted, reflects the overall amount of variance in the items accounted for by the latent construct. According to Fornell and Larcker (1981), average variance extracted is a more conservative measure compared with composite reliability, and the acceptance value of average variance extracted is 0.5 at the minimum.

The structural model defines the relationship among the unobserved variables. Accordingly, it specifies the manner by which particular latent

variables directly or indirectly influence changes in the values of other latent variables in the model (Byrne, 2006). According to research conducted by Bagozzi and Yi (1988), Jöreskog and Sörbom (1989), and Bentler (1992), six indices are selected as measurements of a model's overall goodness-of-fit. The first index is ratio of Chi-square/degree of freedom (χ^2/df) and the suggested acceptable ratio level is less than 3.0 (Bagozzi and Yi 1988; Chin and Todd 1995; Hair *et al.* 2006). However, Chi-square value is easily affected by sample size. The other five indices and acceptable level are goodness-of-fit index (GFI > 0.9), adjusted goodness-of-fit index (AGFI > 0.9), normal fit index (NFI > 0.9), root mean square residual (RMR < 0.05), and root mean square error of approximation (RMSEA < 0.05).

3.3 Test and analysis of service quality gap

In the second stage, questionnaires are developed into three sections based on the key service factors identified in the first stage. The first section of the survey investigates the consumer expectation on supermarket service quality before shopping. The second section explores the consumer's perception of the supermarket's delivered service quality after shopping' it uses a five-point Likert scale. The third section of the survey collects participants' demographic information. As the supermarket is selected as a study case of the service sector in this study, the survey was conducted with the support of selected supermarkets during business hours.

Respondents were randomly selected from experienced consumers entering the supermarket's entrance. The first section of the survey sought to obtain respondents' expectation of the supermarket's service. After these respondents checked out at the counter, they were again asked for their perceived service quality based on their shopping experience and demographic information. To avoid the contrast effect, perceived service quality questionnaires were randomly renumbered; this eliminated the possibility of making a pair comparison of prior expectation questionnaires.

The discrepancy between consumer's expectation before receiving service and perception after receiving service is further analyzed as one of three service quality gaps. By means of a pairwise t-test at 5% significant level, three types of service quality gaps can be effectively distinguished as follows: (1) ideal quality, (2) unacceptable quality, and (3) dynamic satisfactory quality. Definitions of the three service quality gaps are delineated as follows:

(1) Ideal quality: As the degree of consumers' expectations is significantly smaller than that of perceptions, a positive discrepancy (gap) of service quality is recognized as an ideal service quality.

(2) Unacceptable quality: As the degree of consumers' expectations is significantly greater than that of perceptions, a negative gap of service quality is recognized as unacceptable service quality.

(3) Dynamic satisfactory quality: As the degree of consumers' perceptions is equal to expectations, or the p-value of t-test does not attain the significant level of 0.05, a service quality gap does not exist. Despite this, consumer's satisfaction over received service is under an unstable status and thus recognized as a dynamic satisfactory quality. Under this circumstance, any change in delivered service level or consumer's expectation will give rise to the gap. For example, an increase in service level or a decrease in consumer's expectation may result in a significantly positive gap, which is then regarded as ideal quality. Hence, managers should continually improve service level to enhance customer satisfaction.

4. Findings

4.1 EFA of key service quality factors

Out of 150 distributed questionnaires, 144 valid responses were received. Collected data was first tested by item analysis of criterion of internal consistency. Following t-test of each item's discriminant power, four items (12, 26, 31, and 33) were removed from the list. An additional four items (12, 19, 26, 31, and 32) failed the Pearson correlation test and were thus removed. Next, two items (10 and 19) failed the reliability test as their communality values were less than 0.5. As a result, a total of seven items were removed and 29 items were retained in the list, as shown in Table 1.

The remaining 29 items were further tested by factor analysis to eliminate redundant items according to factor loading. Each item was classified into corresponding constructs. First, factor analysis was repeated thrice to remove double loading items when a difference value is less than 0.5. In the end, six items

Table 1. Item analysis of supermarket's key service quality factors

Key service quality factors	Item Analysis		Reliability Analysis
	Discriminant power test	Person test	Communality
1. Has fine and attracting exterior.	4.537**	0.433**	0.647
2. Provides free parking.	4.264**	0.356**	0.737
3. Provides emergency escape facilities.	5.307**	0.506**	0.680
4. Has anniversary promotional campaigns.	4.621**	0.510**	0.604
5. Has a broadcasting system with music.	2.541*	0.334**	0.674
6. Has home delivery service.	2.364*	0.296**	0.758
7. Provides a fine shopping atmosphere.	2.916**	0.358**	0.563
8. Has a cash machine inside.	4.866**	0.431**	0.584
9. Provides free locker service.	4.314**	0.497**	0.684
10. Provides free shopping cart (Del).	3.678**	0.394**	0.469
11. Has initiative in caring for customers.	4.480**	0.454**	0.758
12. Checkout are effective and efficient(Del).	0.112	0.013	0.711
13. The staff members are humble in service.	4.404**	0.477**	0.577
14. The supermarket is air-conditioned.	3.308**	0.411**	0.627
15. Indoor design is comfortable and flowing.	2.698**	0.385**	0.645
16. Provides fresh goods daily.	15.198**	0.779**	0.750
17. Signboards are definite and clear.	10.502**	0.690**	0.712
18. Guarantees food freshness.	2.485*	0.394**	0.728
19. Staff members wear neat uniforms (Del).	2.303*	-0.169	0.417
20. Gives discount to its members.	4.220**	0.298**	0.789
21. Staff correctly check out the goods.	6.311**	0.620**	0.677
22. Has a bonus award system for members.	3.021**	0.378**	0.767
23. Provides fresh trail food to customers.	3.627**	0.387**	0.794
24. Sells a variety of goods.	2.386*	0.273**	0.695
25. Gives birthday discount to customers.	3.664**	0.231*	0.665
26. Sets everything in order (Del).	1.602	0.087	0.708
27. Tags safety labels onto the goods.	2.404*	0.285**	0.648
28. Quick response to customer's question.	4.063**	0.319**	0.788
29. Guarantees product reliability.	4.123**	0.280**	0.756
30. Has customer phone service.	3.209**	0.320**	0.660
31. Provides Internet shopping service (Del).	0.961	-0.054	0.724
32. Packages fresh goods properly (Del).	2.781**	0.173	0.684
33. The supermarket is brilliantly lit (Del).	1.888	0.212*	0.770
34. Publishes DM regularly.	5.122**	0.444**	0.597
35. Show good service attitude to customers.	4.400**	0.360**	0.849
36. Keeps good sanitation.	5.201**	0.540**	0.699

(1, 5, 8, 13, 16, and 24) were removed while 23 items were retained in the scale. The remaining items were classified into five constructs: thoughtful convenience, reliable safety, reward system, surrounding facility, and customer service. As each item's factor loading is greater than 0.5, the cumulative variance attains the level of 65.43%, and each Cronbach α is greater than 0.7, the result of exploratory factor analysis is adjudged reliable.

4.2 First-order factor analysis of key service quality factors

A total of 250 questionnaires were distributed for CFA of service quality; 181 valid responses were received. After item analysis, a total of three items—the communality of which is smaller than 0.5—were dropped. The remaining 20 items were analyzed by structural equation models (SEM) using AMOS 6.0 software for testing validity and reliability.

To evaluate the measurement model, individual item reliability was tested with measurement coefficient. These measurement coefficients range between 0.72 and 0.87, which are higher than 0.5 as suggested by Hair *et al.* (2006), and 0.71 as suggested by Bagozzi (1981).

Composite reliability (CR) and variance extracted (VE) of five constructs were tested as well for evaluating measurement model. The test result demonstrates that five constructs' CR and VE values are higher than the suggested values of 0.6 and 0.5, respectively (Hair *et al.*, 2006; Fornell and Larcker, 1981). By comparing CR* and VE* of the original 23 items, the five constructs of 20 items obtained even higher CR and VE values. The findings reveal that after deleting three items, the service quality model not only has internal consistency in measurement model but high reliability and convergent validity in each construct as well.

4.3 Second-order factor analysismodel of key service quality factors:

Second-order analysis model of CFA was tested by SEM (see Figure 2). Under a degree of freedom of 165, the model's overall goodness-of-fit is first tested by the ratio of χ2/df (1.166), which is smaller than the suggested value of three; it is under acceptable range. Additionally, five indices likewise show the model's goodness-of-fit as acceptable. These are as follows: GFI (0.908 > 0.9); CFI (0.985 > 0.9); NFI (0.907 > 0.9); RMR (0.037 < 0.05); and RMSEA (0.030 < 0.05). In

turn, the proposed service quality model
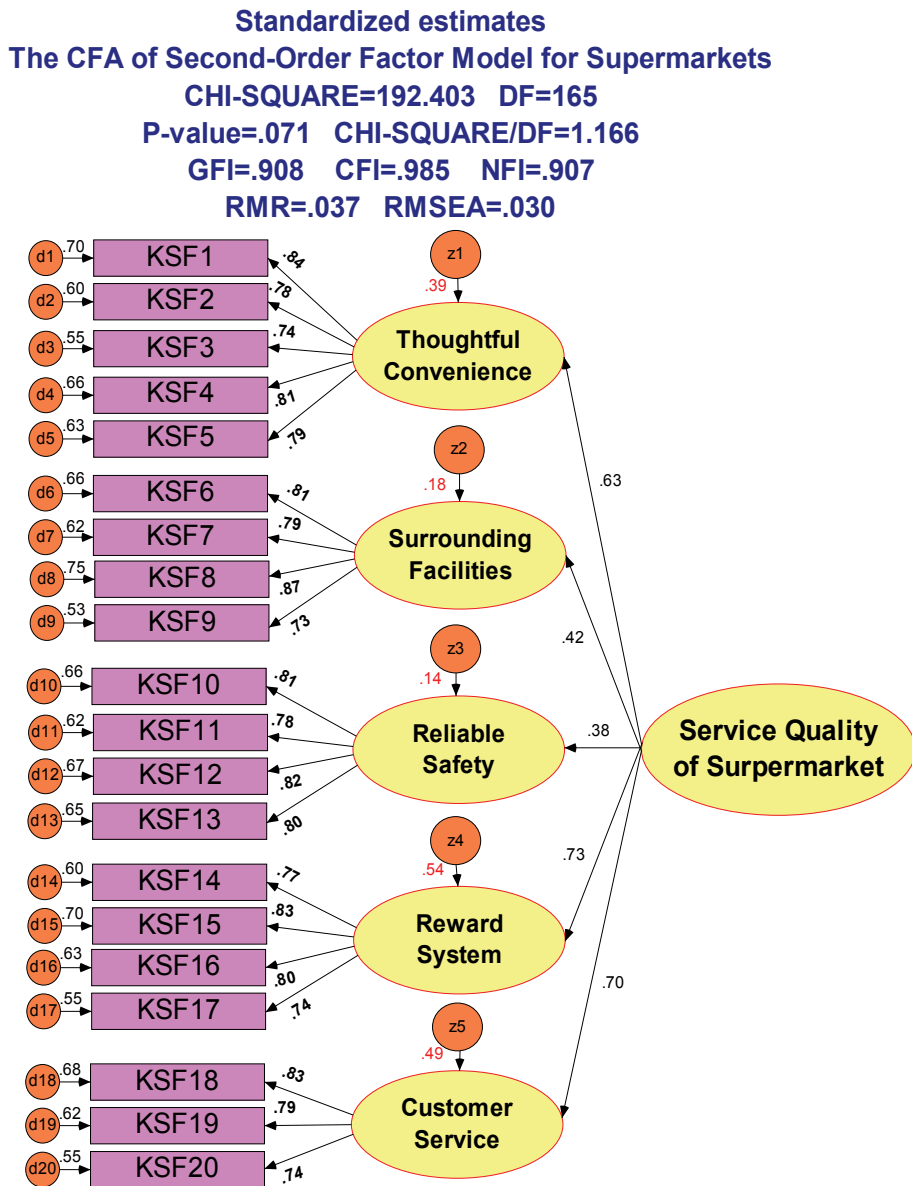exhibits good fitness of factors and
constructs as questionnaires.

Fig.2. Second-order factor analysis model.

4.4 Analysis of service quality gap

Based on the framework of the proposed service quality diagnosis model for supermarkets, a questionnaire was developed under the five constructs of twenty key service quality factors. This allowed for further exploring service quality gap in the second stage. A total of 300 questionnaires were distributed and 223 valid questionnaires were received. Under the significance level of 5%, the gap between the expected and perceived service of the customer was tested by a pairwise t-test. Findings are presented in Table 2. Subsequently, key service quality factors were classified into one of three types of service quality based on the definitions of service quality gap. A service quality matrix (Table 3) was further developed to demonstrate the weaknesses and strengths of service quality construct as well as individual key service quality factor.

Table2. Pairwiset-test of customer's expectation and perception of service quality

Construct (Codes)	Key service quality factors	Expectation		Perception		Gap	t-test	p-value
		mean	St.Dev.	mean	St.Dev.			
Thoughtful Convenience (C1)	KSF1	3.67	0.94	3.61	0.71	-0.07	-0.90	0.367
	KSF2	3.59	0.79	3.77	0.94	0.18	2.47	0.014**
	KSF3	3.70	0.77	3.86	0.90	0.16	2.24	0.026*
	KSF4	3.87	0.82	3.62	0.96	-0.25	-2.90	0.004**
	KSF5	3.82	0.94	3.58	0.99	-0.24	-2.60	0.010**
Surrounding Facilities (C2)	KSF6	3.85	0.84	3.61	1.03	-0.25	-3.18	0.002**
	KSF7	3.72	0.88	3.67	0.75	-0.05	-0.74	0.458
	KSF8	3.83	0.89	3.62	0.68	-0.21	-3.11	0.002**
	KSF9	3.62	0.90	3.78	0.78	0.16	2.16	0.032*
Reliable Safety (C3)	KSF10	3.77	1.03	3.73	2.12	-0.04	-0.25	0.807
	KSF11	3.91	0.95	3.74	0.78	-0.17	-2.09	0.038*
	KSF12	3.95	0.85	3.72	0.66	-0.23	-3.28	0.001**
	KSF13	3.75	0.98	3.80	0.49	0.05	0.75	0.454
Reward System (C4)	KSF14	3.83	0.95	3.87	0.68	0.04	0.52	0.604
	KSF15	3.87	0.85	3.52	0.75	-0.35	-5.18	0.000**
	KSF16	3.89	1.09	3.59	1.17	-0.30	-2.52	0.012**
	KSF17	3.45	1.25	3.52	1.23	0.07	0.57	0.572
Customer Service (C5)	KSF18	3.73	1.01	3.63	0.80	-0.09	-1.11	0.267
	KSF19	3.80	0.86	3.60	0.73	-0.20	-2.45	0.015*
	KSF20	3.78	0.98	3.55	0.75	-0.24	-2.87	0.005**

*:significant level = .05; **: significant level = .01

Ideal service quality is recognized when a customer's perceived service level is greater than expected service level and the p-value of t-test is statistically significant. Table 3 demonstrates that a total of three factors are included in this sector: KSF2, KSF3, and KSF9. Within this context, supermarket managers should maintain the status quo to maintain high service quality level. Unacceptable service quality is defined as a customer's expected service level exceeding perceived service level; here, the p-value of t-test is statistically significant. A total of ten factors are included in this sector: KSF3, KSF5, KSF6, KSF8, KSF11, KSF12, KSF15, KSF16, KSF19, and KSF20. For these factors, managers should identify the causes of unacceptable service quality and introduce corresponding measures to address the weakness.

Dynamic service quality is the factor with a gap value of zero; herein, the p-value of t-test value is not statistically significant. Dynamic service quality factors include KSF1, KSF7, KSF10, KSF13, KSF17, KSF14, and KSF18. As these factors are under unstable status, they have a greater chance of becoming unacceptable service quality factors. However, satisfaction level of these factors is easier to improve with a little more effort while comparing with unacceptable factors.

Table 3. Service quality gap matrix

Constructs	Service Quality Gap		
	Ideal Service Quality（PS＞ES）	Unacceptable Service Quality(PS＜ES)	Dynamic Service Quality（PS = ES）
Thoughtful Convenience	(KSF3) Free parking (KSF2) Regular DM publication	(KSF4) Fine shopping atmosphere (KSF5) Great initiative in caring customers	(KSF1) Free locker service
Surrounding Facilities	(KSF9) Definite and clear signboards	(KSF8) Air conditioned shopping. (KSF6) Good sanitation	(KSF7) Comfortable and flowing interior space designs
Reliable Safety		(KSF12) Food freshness guarantees (KSF11) Product reliability guarantees	(KSF10) Correctly check out the goods at counter (KSF13) Safety label on goods
Reward System		(KSF15) Memberbonus award system (KSF16) Customer birthday discount	(KSF17) Fresh trail food available (KSF14) Members discount
Customer Service		(KSF19) Customer complaint hotline (KSF20) Good customer service attitude	(KSF18)Effective process of customer suggestion

Dynamic service qualityis the factor with a gap value of zero; herein, the p-value of t-test value is not statistically significant. Dynamic service quality factors includeKSF1, KSF7, KSF10, KSF13, KSF17, KSF14, and KSF18. As these factors are under unstable status, they have a greater chance of becoming unacceptable service quality factors. However, satisfaction level of these factorsis easier to improve with a little more effort while comparing with unacceptable factors.

5. Conclusion

Through the years, the PZB model of service quality gap (Parasuraman *et al.* 1985) has served as an essential base for developing various service quality models. The model provides managers with a tool for measuring the gap between customers' expected and perceived service, thus allowing the organization to focus on and improve weak service areas. However, a number of studies (Carman 1990; Cronin and Taylor 1992) have acknowledged that the act of asking respondents to express expectation and perception of a delivered service in one instrument will result in less desirable results. In fact, without taking the survey process into consideration, respondents were often confused when simultaneously assessing their expectations and perceptions of a received service. Perceptions of service quality can be influenced by pair comparison of expectation owing to a contrast effect. Thus, a service quality gap cannot be effectively distinguished.

Another issue concerning the construct consistency of SERVQUAL scale is addressed in this study as well. Although the five constructs of SERVQUAL is frequently employed by scholars and practitioners as a tool for measuring service quality, a number of studies (Finn and Lamb 1991; Babakus and Boller 1992) demonstrate that the consistency of five constructs is not attained. To overcome these issues, this study developed a service quality diagnosis model based on previous service quality research. This explored the service quality issue in supermarkets in two stages. In the first stage, key service quality factors and scale by EFA were developed. The measurement and structure models of scale were further tested by CFA for reliability and validity. Further, the model's goodness-of-fit was tested by first-order and second-order factor analyses.

In the second stage, a questionnaire was developed under the five constructs

of 20 key service quality factors. The survey process was conducted separately from the SERVQUAL method, which was designed to obtain respondents' expectation and perception of service quality at the same time. Instead, the survey was designed to ask respondents to express their expectations of a supermarket's service quality before shopping and their perception of the received service after shopping. Gaps between expectation and perception of service quality of each key service factors were tested by pairwise t-test. These were subsequently classified into three types: ideal quality, dynamic satisfactory quality, and unacceptable quality. As suggested by Parasuraman *et al.* (1994), the reason for organizations to evaluate "service quality" is not only to understand how their service "satisfies" customers, but to identify the gap between their provided services and customers' expected services as well. Based on these identified gaps, managers will be able to explore existing service problems and apply improvements.

6. Suggestions

Findings of the proposed service quality diagnosis model can be illustrated by selected supermarkets. For ideal service quality items, managers may merely maintain the status quo to preserve existing service quality level; customer satisfaction level will remain constant as well. For unacceptable service quality items, on the other hand, managers should immediately take action to improve service quality. Among these unacceptable service quality factors, KSF8 entails high cost for improving hardware facility and it is not easily attained within the short term. However, it must be considered in long-term strategic planning.

An additional six factors (KSF4, KSF5, KSF6, KSF19, and KSF20) are related to internal managerial issues and thus can be improved through regulating managerial institution. For example, enforcing a cleanliness process or a standard operating procedure for responding to customer's complaints will help managers in training staff members to ensure better service. To improve service quality of KSF11 and KSF12, developing a supplier management system will be beneficial to ensure product safety and reliability. Lastly, KSF15 and KSF16 are related to promotional activities. To attract increased consumer attention and encourage purchasing, companies can

launch different campaigns such as national festivals or seasonal food or product promotions. Moreover, supermarkets may serve as a destination for field trips for kindergarten or elementary school pupils who will eventually become potential customers in the near future.

For the dynamic satisfactory service quality item, managers should enforce necessary measures to improve service items so that unstable status of satisfaction will become stable. In fact, satisfaction level of these factors is easier to improve with a little more effort when compared with unacceptable factors. To address these issues, supermarkets should further identify the cause of low satisfaction level of each factor and establish an improvement plan integrated into the business strategy. For follow-up research, the authors of this study suggest implementing the service quality diagnosis model in other service industries to validate its application in various sectors.

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