

## OCEAN TRANSPORT SERVICE QUALITY ASSESSMENT

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### Abstract

Ocean transportation is certainly a service activity that is one of the key logistics functions. The level of customer service relies very much upon the quality of transport operators. However, quality of service is difficult to identify. This study provides directions for measuring service quality performance. It provides methodological guidelines as well as suggestions on predictor variables which can be used for monitoring performance. The analysis of the selected cases reveal the "Service Quality Gap Model" is useful to assess service quality but it ought to be used with care. Service quality is perceived differently by the frontline staff and customer in each country. Tangibility features of service quality do not have much importance to the customer in determining service quality for B2B, especially shipping company. To lift the level of quality, service customization for the customer in each country is necessary. Customer know-how and strong commitment from management of all levels is the prerequisite for firms.

**Keywords:** Service Quality Assessment; SERVQUAL; Shipping; Business-to-Business; Transport and Logistics

### 1. Introduction

Transportation plays a very important role in providing a desired level of customer service at the lowest possible total cost because transportation creates value or place utility. Meanwhile, transportation also creates time utility because it determines how fast and how consistently products move from one point to another [1]. Transportation becomes more complex when trade is not done in the domestic market. It plays a vital role in the international market where there is constantly increasing pressure to make products more quickly, with more variety, at the lowest possible cost and the winner in the global arena will be the one who can meet and exceed customer's requirements. [2]

There is no exception for Thailand in the global competition arena. As a result of globalization, we can see the dramatic growth in external trade (both import and export) of Thailand in recent years; this growth has driven higher demand on ocean transportation services. According to Banomyong et al (2005) [3], in Thailand, it was found that ocean transport is the most preferred

transportation mode. Because service possess the intangible characteristics which is difficult to measure, therefore, service quality tend not to be measured and organization tend to measure what is easy to measure and quantify and are reluctant to use soft qualitative measures. [4] Thailand is in the early stage of logistics development and lacking of understanding in logistics and supply chain development, but most firms tend to focus on technology in leading to supply chain [5]. Therefore, there is no recorded empirical research on the service quality of ocean transport operator in Thailand has appeared in the literature.

The objective is to introduce methodological guidelines as well as proposed predictor variables which can be used for measuring service quality for ocean transport service. Additionally, it intends to seek a greater understanding of problem and current status of the selected carrier in providing services, and meantime explore the opportunity to improve service quality.

Because services are delivered under different environment, conditions, and culture, service quality is involving human behavior and therefore it is not possible to produce totally accurate conclusion of quality under aggregate basis. Thus, we would set the hypothesis for this research as:

$H_0: \mu_{kh} = \mu_{th} = \mu_{vn}$  Service quality perceived in each country is not different

$H_1: \text{at least one pair of } \mu_{kh}, \mu_{th}, \mu_{vn} \text{ is not equal.}$  At least Service quality perceived between two countries is different.

## 2. Literature Review

### 2.1. Role of Ocean Transport

On macro view, total transportation cost in Thailand contribute approximately 8.48% and 8.86% of GDP in year 1995 and 1998 respectively while ocean transport are the highest growth in all transportation sector. Ocean transportation sector itself contributes approximately 0.36% and 0.45% of GDP in year 1995 and 1998 respectively. [6]

On micro level, ocean transportation is also one of important functions in logistics and marketing. Logistics involves the movement of products from point-of-origin to point-of-consumption. A product produced at one point has very little value to the prospective customer unless it is moved to the point where it will be consumed. Transportation achieves this movement and creates place utility. Time utility is primarily added by the warehousing and storage of products until they are needed by customers. Transportation is also a factor in creation of time utility because it determines how fast and how consistently products move from one point to another. These factors are referred to as time-in-transit and consistency of service. Transportation is often the single largest cost in the logistics process.[1]

When transportation and inventory costs are substantial on the input and output sides of the production process, the evaluation of distribution means is necessary and ocean transport is important when shipping cost is more important than speed. [7] According to the study of Lin and

Hinson (1998) [8], shipping of products is an essential element of the total export process and ocean transport is the second most preferred mode of transport by shipper.

## 2.2. Nature of services in general

Services are deeds, process and performance. [9] Processes are the fundamental activities that organizations use to do work and achieve their goal. Process is consisting of any activity or group of activities that takes one or more inputs transforms and adds value to them and provides one or more outputs for the customers.[10]

For Service, the process is the product. Service process is different from manufacturing process because it possesses some distinctive characteristics of service operations:

- a) Customer participation in the service process
- b) Simultaneity
- c) Perishability
- d) Intangibility
- e) Heterogeneity [11]

Regardless of services category, the service provider share similar challenge. Services with capital intensive, such as shipping line or airlines, require close monitoring of technological advances to remain competitive. This high capital investment also requires managers to schedule demand to maintain utilization of the equipment. Alternatively, managers of highly labor intensive services must concentrate on personnel matters. The degree of customization affects the ability to control the quality of service being delivered and the perception of the service by the customer. [12]

Challenges are not just service managing nature, but also the way of measuring its quality. Measuring service quality is challenge because customer satisfaction is determined by many intangible factors and service quality contains many psychological features. Service quality often extends beyond the immediate encounter because it has an impact on a person's future quality of life. [11]

Service quality is a complex construct and, as such, generates many debates regarding its conceptualization and measurement, causing confusion among researcher and practitioner alike. [13]

## 2.3. Specific Nature of Ocean Transport service

It is important to understand the some special characteristics of ocean transport service in depth when service quality is measured

### *2.4.1. Multi-Parties involvement*

The current Incoterms, devised and published by the International Chamber of Commerce, consisting of 13 terms and each term shall determine the function of bank, carrier, shipper, and consignee differently [14] and it influent the way of shipping lines delivery service.

Shipping lines often divide their organizations into specialized departments, each department, directly or indirectly, having an interface with the customers. The customer's perception of the

shipping line's service quality should be determined considerably by his/her experience with these contacts or support persons in the service provider organization. [15]

#### 2.4.2. *Ocean transport is Business-to-Business Service (B2B) [15] [16]*

Role of shipping service is growing in world trade and it is also a service widely used by business organizations around the world. Service quality is a critical concern in business-to-business marketing of services because of its impact on the organizational customers' own service to their customers. Poor shipping services can have drastic consequences on the exports business of the organizations that may face loss of orders, increased claims, lower prices, delayed payments and generally lower supplier rating. Service quality in business-to-business industry has the additional dimension of the corporate interaction applying to the customer not just the supplier. [15]

#### 2.4.3 *Ocean Transportation is information rich activities*

In principle, apart from place utility, transportation also generate time utility because it determines how fast and how consistently products move from one point to another. Since transportation creates common value as warehouse, information transfer is also vital function of transportation which occurs simultaneously with movement and storage functions (inventory in-transit). Today's shipping line relying increasingly on computerized information transfer using electronic data interchange (EDI) and internet to improve both the speed and accuracy of information transfer. [1] Surprisingly EDI facility becomes one of most important factors in selecting shipping line and logistics provider as case of Thailand's exporter an example. [3]

### 2.5. Models used in Measuring Service Quality

Service is usually the result of the interaction between the customer and the service system, including the contact staff, equipment, service environment and facilities. It is this interaction that results in the characteristics of service which make the provision, measurement and control of quality so difficult. [4] There are three areas of difficulty in measuring service quality which consist of:

- a) methodological problems relating to the service quality dimensions;
- b) variations in customer expectations; and
- c) the nature of the measurement tools [17]

Hence measurement of service can be done in either hard or soft. Hard measures are those which are quantifiable or objective. Soft measures are those which are qualitative, judgmental, and subjective and based on perceptual data. [4] Because of this difficulty, there are many debates and models of service quality measurement during past few years. Each service measurement model depends very much upon how the researcher view and define service quality which causes different in handling service quality issues. [13] [18] [19]

Parasuraman et al., [20] defined service quality stems from a comparison of expectation with performance perception (disconfirmation). Teas [21] view service quality derives from a comparison of performance with ideal standards. Cronin and Taylor [22] view service quality derive from

perception of performance alone. Although there are several debates over service quality definition, but all researcher share common ground that:

- a) service quality is an attitude and it is distinct from customer satisfaction
- b) perceptions of performance need to be measured
- c) the number and definition of dimensions depends on the service context and
- d) negatively worded statement should be avoid unless the survey is 'short' [19]

Since the subject of service quality is very rich in context of definitions, models and measurement issue. Several researchers explored the subjects with varying perspectives and using different methodologies [23] and examples are as follows:

- a) Technical and functional quality model [13] [23] [24]
- b) Gap Model [25][20]
- c) Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) [26],[27][28]
- d) Attribute Service Quality Model [29]
- e) Synthesized model of service quality [30]
- f) Performance Only Model [31] [32]
- g) Ideal value model of service quality [33]
- h) Evaluated performance and normed quality model [34]
- i) Model of perceived service quality and satisfaction [35]
- j) PCP attribute model [36]
- k) Retail Service quality and perceived value model [37]
- l) Service Quality, Customer Value and customer Satisfaction Model [38]

It is noticeably that even though there are several service quality measurement models, but all of them are rooted from the three definitions of service quality and same common area. Among service quality measurement model, SERVQUAL are more mature and gain popular among services research.

### 3. Methodology

The case study was selected from a Thai shipping line. This study is limited to Indochina region only which is consisting of Cambodia, Thailand and Vietnam. Sample represents the respondents from managerial level, frontline staff and customers of the selected company in three countries. The data was collected through questionnaires with 350 respondents and 334 questionnaires were returned (95.4%). On customer side, the sample was randomly drawn from a listing of customers during past 12 months. The type of companies includes manufacturing, trading, freight forwarder and shipping line.

The former literature provides many service quality assessment models which depend on how the researcher defines service quality. On this study, service quality gap model (SERVQUAL) is utilized. SERVQUAL is not perfect, but useful because it can help service manager to identify and

focus on service process issues. The model has been developed to measure service quality across various environments. The method is based on the calculation of the differences between expectations and perceptions on a number of pre-specified criteria [39].

There is a concern regarding the reliability of comparing service expectations from a general industry sector with the actual service quality perception of a particular company. Expectation and perception may not be correlated and can cause varying result from different respondents. A possible solution to the problem is to tailor each SERVQUAL study to the particular company or industry under investigation. [39] To tailor SERVQUAL, measurement indices are collected from various sources, including SERVQUAL's universal indices and the former literatures. Finally the indices are validated by the panel of expert which consisting of expert from shipping and logistics industry, and importer and exporter to find the suitability for shipping industry in constructing of questionnaire.

Service quality assessment is measured in accordance with SERVQUAL, the model intend to measure Gap in five parts;

Gap-1, not knowing what customer expects

Gap-2, the wrong service quality standard

Gap-3, the service performance gap

Gap-4, when promises do not match delivery

Gap-5, customer's perceived service quality shortfall

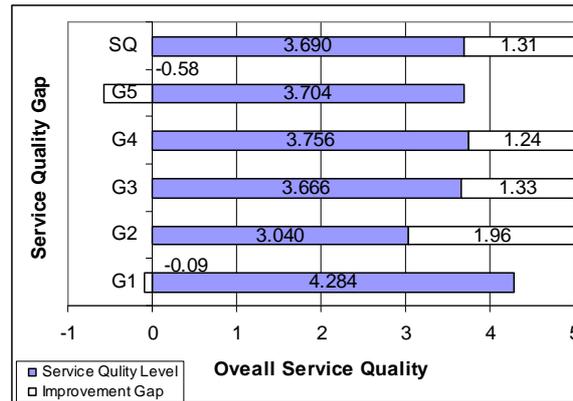
ANOVA is used for testing the hypothesis of customer's perception in each country toward service quality. However, its drawback is that ANOVA cannot tell us which pair of dependent variable generates differences between means. To identify the difference between the pair of dependent variable, we use Scheffe's test for mean comparison. In the final stage, multiple regressions are used to identify the factors which influent the perception of customer in each country.

## 4. Result

### 4.1. Overall Service Quality of the selected carrier

The overall picture service quality (as shown in Figure 2) is rated as fair. Management of the firm understand customer's requirement very well as reflect in the score of G1, but the problem happen during transition of customer know-how to service specification (G2).

The shortfall in quality of service specification is the result of senior management put too little commitment to service quality, especially resources commitment in delivering service quality to customer as it was low scored by manager. This SERVQUAL score is also corresponding with statistics testing. The formal process for setting service quality goal of company is another factor which causes a large gap in service specification.



**Figure 2** Overall service quality

When the standard operating procedure are channel down the line to frontline staff, additional service gap incur. Carrier's service performance and service delivery is fair quality. Among frontline office, Thailand contribute the biggest discrepancies and follow by Vietnam and Cambodia respectively. The reason behind service performance (G3) shortfall in quality is lacking perceived control when staff is keeping on to (1) solve the uncontrollable problem, (2) lacking of freedom to perform job, (3) service too much customer (4) dependent on other people to perform job.

Role conflict account considerable amount of discrepancies in services performance. It has been fed-back by frontline staff that the amount of paper work and selling focus of company keep them away from providing quality service as evidence by the service performance score.

Considering service delivery quality (G4), their quality is acceptable. Employee perceives company under-perform because they cannot keep promise given to customer at all time – as revealed by SERVQUAL score. The largest discrepancy is in Thailand while there is lesser in Cambodia and Vietnam.

Customer assess service quality gap (G5), the overall quality is good, especially assurance dimension. The major quality shortfall is on responsiveness dimension which generate the biggest gap among all service quality dimension.

From figure 3, the result of study confirmed that customer in different market perceive service quality of the carrier differently. To take action from aggregate information is not enough because standard action cannot meet the expectation of customer in all market.

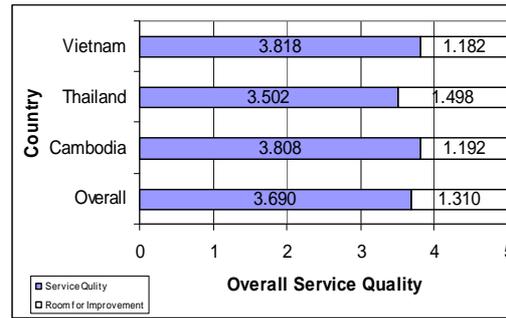


Figure 3 Comparison of service quality in each country

To confirm this service perception of customer in three countries, thus, we set the hypothesis for this testing as:

$H_0: \mu_{kh} = \mu_{th} = \mu_{vn}$  Service quality perceived in each country is not different

$H_1: \text{at least one pair of } \mu_{kh}, \mu_{th}, \mu_{vn} \text{ is not equal.}$  At least Service quality perceived between two countries is different.

By using ANOVA to test the relationship of customers' perception against services provided by the selected carrier in each country, the result reveal that there is a significant difference between customers' perception and country operated,  $F_{(2,260)} = 4.127, p < 0.05$ . Then the  $H_1$  is accepted.

From ANOVA testing, it has proven that there is no panacea for service quality if firm is operating in multi-national market because customer perceives service quality differently

#### 4.2 Service quality in Cambodia

The overall service quality in Cambodia is rated good as evidence in figure-4. The largest quality gap is on the tangibility dimension, standard of appearance of equipment, particularly container condition. On the assurance dimension of service performance is the second largest gap, fair quality. The employees feel alright with the knowledge and courtesy in delivering service to customer that they can perform to meet company's desire. Empathy aspect is fair; employees feel alright with the individualized service paid to their customer. There is reliability and responsiveness of service performance is rated on good quality.

Service delivery gap (G4), office in Cambodia can deliver good service quality. The employee perceived they can deliver service to customer as per what company promised it to be. Tangibility, assurance and empathy aspect is fair, and it is corresponding with G3. Trace back to managerial gap, G1 & G2, it was happening the same while service quality always fall short on tangibility, assurance and empathy. Therefore, we can conclude that from G-1 through G4, service quality shortfall heavily occur on tangibility, assurance and empathy aspect.

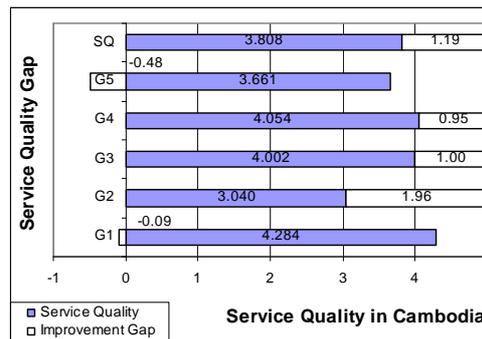


Figure 4 Service quality in Cambodia

Customers assess service quality (G5), customers perceive good service quality. Service quality shortfall is on reliability, responsiveness, tangibility, empathy and assurance respectively. Multiple regressions are used to identify the relationship between gap-5 and customers' perception towards service and result is as follows:

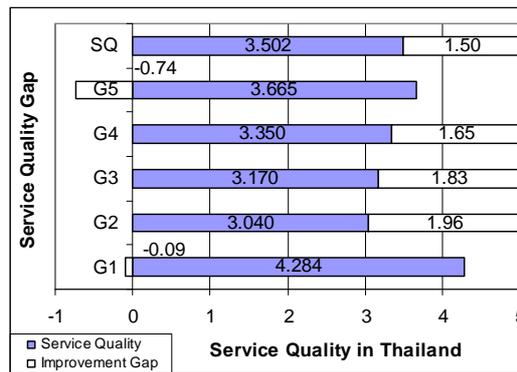
By using stepwise method, a significant model emerged (Adjusted R square = .567;  $F_{(5,78)} = 22.770$ ,  $p < 0.05$ ). Significant variable as shown below:

<u>Predictor Variable</u>	<u>Beta</u>	<u>p</u>
P5410 Knowledge to answer question	-.275	.005
P557 Accommodation of special needs.	-.331	.001
P554 Keep customer informed on vessel delay.	-.269	.004
P546 Global Service	.206	.015
P534 The willingness of service personnel to help customer	-.216	.028

Other variables are not a significant predictor in this model.

#### 4.3. Service Quality in Thailand

From Figure 5, the selected carrier provides fair service quality in Thailand where is its home-ground. Service quality shortfall is mainly on G2-G3-G4 which is internal quality. Service performance quality (G3) in Thailand is moderate. This is the quality of employee when they are unable or unwilling to perform job at the desired level. The tangibility aspects are poorly rated. Staff perceives company poorly maintain standard of the appearance of transportation equipment, physical facility and other equipment. This is corresponding to customer's experience in using company's container (P513) with considerable gap of improvement.



**Figure 5** Overall picture of service quality in Thailand

Staff perceives poorly in delivery the promised service, particularly, the appearance and condition of transportation equipment which is a big area of improvement for service quality in Thailand. The problem of the selected carrier's service quality in Thailand stem from following factors:

- Role conflict – There are too much paper work which take away their time to concentrate on their customer properly. Company policy is also focusing on selling rather than servicing.
- Supervisory control system – There is no clear rewards, incentive or motivation for staff who initiate quality service to customer. The effort in improving service quality is frequently not go along with remuneration.
- Lacking of perceived control – Resources is drained in solving uncontrollable problem, no freedom to perform job, number of customer to be serviced is not related to number of resources, and resources is wasted on the job which is depend on other people. It's unfortunate that the perceived control is low because there are a lot of rules and regulation to be follows. Too much working process becomes a red tape and cause deteriorates the responsive quality to customer.
- Technology-job-fit – this reveal the technology used in Thailand is just enough for undertaking job and the situation is badly perceived when the technology does not match with number of resources and number of customers to be services.

Importantly, Thai customer perceives good service quality from all angles, but the biggest improvement gap is on responsiveness. The study reveals the quality shortfall on the area of prompt service from its service personnel, speedy in releasing shipping document, and speedy on claim. Other points which drag the quality down consist of (1) the condition of container (2) sufficient number of service personnel (3) the ability of contact personnel in keeping customer informed on vessel delay and (4) market communication through internet.

By using stepwise method, a significant model emerged (Adjusted R square = .531;  $F_{(6,121)} = 24.953, p < 0.05$ ). Significant variable as shown below:

<u>Predictor Variable</u>	<u>Beta</u>	<u>p</u>
P523 Sincerity in solving problem for customer	-.258	.003
P545 Container demand fulfillment	-.245	.001
P554 Market communication through internet	-.190	.006
P553 Shipping document releasing flexibility	-.197	.008
P534 The willingness of service personnel to help customer	-.199	.016
P546 Global Service	.145	.036

Other variables are not a significant predictor in this model.

#### 4.4. Service quality in Vietnam

The overall service quality in Vietnam is good. Service performance quality (G3) in Vietnam is fairly evaluated. The largest gap of service performance is the responsiveness quality and reliability quality.

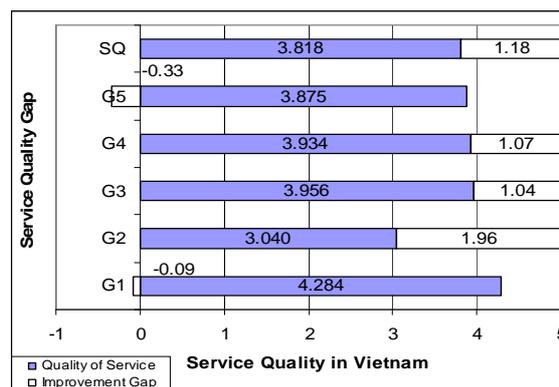


Figure 6 Service quality in Vietnam.

After tracing this problem back inside deeper, we found the antecedent to service performance quality majority stem from following root causes:

- a) Lacking of perceived control - Frontline staff spends a lot of time to resolve problems over which they have little control. Frontline staffs feel a lack of control over their job because too many customers demand service at the same time. On these two issues, the quality is rather poor and need management attention to improve this situation and correct staff perception at the same time.
- b) Role Conflict - Vietnamese staffs encountering the problem of flooding by paper work instead of focusing on quality deliver to their customer. Staff perceives company focus heavily on selling rather than focusing on the quality delivered to customer.

- c) Supervisory Control System - The staff perceives that management does not respond to staff who pay more effort in improving service quality in term of remuneration or recognition.
- d) Employee-job-fit - This issue is not obvious, but it contribute considerable gap in Vietnam.

The quality of service delivery is moderate and the quality problem originated from internal, (1) the pressure from company to generate new business, (2) the contact staff is exposed to the over-promise, particularly personal selling. This circumstance stems from the company policy which focusing on selling rather than quality giving to customer.

Customers' assessed service quality (G5), Vietnam office can perform well to meet customer expectation with a small gap. Company can fulfill customers' requirements on (1) providing sufficient service personnel (2) providing service safety policy (3) providing right type and size of container upon their need.

SERVQUAL score reveals service quality drawbacks are on (1) internet cargo tracking system and (2) the condition of container provided to its customer.

The multiple regression analysis revealed three major factors have a significant relationship between Vietnamese customer's perception and service quality factors.

By using stepwise method, a significant model emerged (Adjusted R square = .352;  $F_{(3,47)} = 10.034$ ,  $p < 0.05$ ). Significant variable as shown below:

<b><u>Predictor Variable</u></b>	<b><u>Beta</u></b>	<b><u>p</u></b>
P513 Good Container Condition	-0.462	.000
P533 Speedy on Claim Process	-0.308	.014
P544 Ability to obtain assistance from port operator	.258	.032

Other variables are not a significant predictor in this model.

## 5. Conclusion & Discussions

Through statistical testing, the study reveals the difference in quality perception of frontline staff and customer in each country as well as factors determines service quality. Additionally, some interesting issues are found:

- (a) According to Banomyong et al (2005) [3], having said that 'accuracy of documents' and 'updated freight rate' are the most statistically significant for shipper decision making in choosing logistics service provider while transit time is not included. From our study, there is a significant relationship between Thai customers' expectation and transit time. If transit time implies service quality, then it should be a critical factor influent the customer expectation in buying freight. There is a statistically significant difference between the perceptions of quality among the customer in each country which reveals transit-time is a critical factor for Thailand alone, but not

Cambodia and Vietnam. Accuracy of documents and updated freight rate are likewise. Although both factors may be critical in Thailand, it is very questionable for other country. Hence, the accuracy of documents and updated freight rate are possibly not the universal answer for the customer, particularly when freight was purchased outside Thailand.

(b) Comparison of service quality perception between Indochina countries and Singapore.

**Table 1** Comparison of customers' perception towards service quality in each country

Singapore [15]	Cambodia	Thailand	Vietnam
Assurance	Assurance	Reliability	Reliability
Responsiveness	Empathy	Assurance	Responsiveness
Reliability	Reliability	Empathy	Assurance
Empathy	Responsiveness	Responsiveness	Empathy
Tangibility	Tangibility	Tangibility	Tangibility

*(by descending order)*

According to Metha and Durvasula [15], as regards perception, the preferred shipping line were rated tops on assurance and responsiveness, followed by reliability and empathy while perception towards tangibility was on the lowest. From table 1, there are some differences and similarity from our study. The similarity is tangibility dimension that is rated on the lowest. This implies tangibility aspect for shipping line is on the lowest important. Customers perceive service quality on other aspects differently and it is vary from country to country.

For any shipping lines want to implement service quality policy for the multi-branch, it cannot be done by using single approach. Standard operating procedure laid down by head quarter may be able to use in one country, but it may be a different story in another country. Service quality is dynamic and customized because it involves human expectation which is changing over the time. This situation can be evidence by the result of customer's assessing service quality between Cambodia and Thailand. Although the service quality in Thailand is scored slightly higher than Cambodia, but improvement gap in Thailand is bigger. This is because customers' expectation in Thailand is higher than Cambodia. Under this circumstance, it implies that good service quality perception from customer in Cambodia is not probably good. The reason behind this circumstance is that the company is providing service in the oligopoly market where there is a few players and many entry barriers for new competitor. When service is providing in the oligopoly market, the enthusiastic and willingness to service of frontline staff tend to be deficient comparing with Thailand where the perfect competition market is. This situation can be evidence by comparative SERVQUAL score on customer's expectation. Certainly, customer's expectation in Thailand for service quality is higher. In

the oligopoly market, the alternative measurement model should be considered such as SERVPERF [32] because this model takes only performance into consideration.

For shipping lines interested in upgrading their services on an ongoing basis, the study provides directions for measuring service quality performance. It provides methodological guidelines as well as suggestions on predictor variables which can be used for monitoring performance. However, to apply this methodological guideline for multi branch operation, it should be used with caution because the expectation of customer in each country is dominated by different determinants. It also depends upon the shipping lines on which aspect of service quality they are interested. If the shipping lines interested in overall evaluation of service, perception score is enough because it provides a better ability to predict overall evaluation of service than the gap scores. [16] Through marketing research on customers and prospects, shipping lines can simply measure performance perceptions to cover all frontline's activities. They can also use a simplified version of service quality measurement without including customer expectations or even relative importance of service quality determinants. A parsimonious approach appears adequate to monitor the service quality changes and explain customer performance perception. [15] In contrary, if shipping line is interested in other aspects of service quality, gap score were found more useful role to play in identifying the areas of weakness for an organization wherever the gaps in service quality are high and the relative strengths wherever the gap scores are small [16].

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