

A GAP ANALYSIS IN SERVICE QUALITY OF THAI LOGISTICS SERVICE PROVIDERS

Chatwadee Tansakul[†] and Jirachai Buddhakulsomsiri

School of Manufacturing Systems and Mechanical Engineering,
Sirindhorn International Institute of Technology, Thammasat University,
Pathum Thani, 12121, THAILAND

+662-501-3505, Email: chatwadee.tansakul@gmail.com and jirachai@siit.tu.ac.th

Thananya Wasusri, Pappusson Chaiwat and Taweesak Kritjaroen

Graduate School of Management and Innovation,
King Mongkut's University of Technology Thonburi
Bangkok, 10140, THAILAND

+662-470-8000, Email: thananya.was@kmutt.ac.th, pappusson.cha@kmutt.ac.th
and taweesak@kmutt.ac.th

Abstract

Logistics service industry is one of the important flows that have been freed among AEC member countries since 2013. The market for logistics service providers (LSPs) will become more competitive due to its ease in entering the business. Thus, service quality of Thai LSPs should be evaluated to see whether their performance could meet the users' expectation. This paper involves an analysis on the current state of Thai LSPs service quality. The focus is on road transportation. Service quality is modeled using SERVQUAL for measuring five different aspects of quality both from the users' expectation and LSPs' performance. A field survey is conducted to collect data using personal in-depth interviews. Then, a gap analysis is performed using statistical analyses to identify the service quality aspects that need to be improved. Comparison results between users' expectation and LSPs' perception of user expectation show that Thai LSPs has a reasonable understanding of the customer needs in all service quality aspects. Comparisons between LSPs' performance and users' expectation reveal that there are two significant and most important gaps that both users and LSPs agree on, which include information technology (IT) system capability and reliability in basic services such as delivery order fulfillment. Improving IT capability will require a significant investment, while basic services can be improved through training and better logistics management. In addition, the comparison results indicate other service quality aspects that users see significant gaps, while LSPs do not. These gaps may due to insufficient or ineffective communication or perhaps, the gaps really exist, which mean that LSPs overestimate their performance on these aspects.

Keywords: Logistics service providers, Service quality, SERVQUAL, gap analysis

1. INTRODUCTION

The ASEAN Economic Community (AEC), which will be effective in 2015, has ten member countries, including Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar and Cambodia. The concept of this collaboration is "Single market and Production base." Five free flows that have been or will be shared among AEC countries are goods, services, skilled labors, capital, and investment. The AEC population is approximately 590 million (about 9% of world population) with \$149 billion in GDP. AEC's free market will increase regional economic prosperity and stability and reduce development

gaps among member countries. It also creates easy market access and more trading partners, and attracting foreign investors to ASEAN.

Logistics service is one of the industries that have already been liberalized among AEC members since 2013. This has increased the competitiveness in the logistics service market. To survive, logistics service providers (LSPs) must concentrate on the quality of logistics service provided to customers. Performance of logistics business among different countries has been well studied and reported. The World Bank first distributed the Logistics Performance Index (LPI) in 2007. LPI is created as a comprehensive index to help countries identify challenges and opportunities they face in trade logistics performance by conducting the survey every two years. The trade logistics profiles of up to 155 countries are compared using LPI. Logistics performance are rated on a scale of 1 (worst) to 5 (best) by more than 1,000 international freight forwarders, who rated eight foreign countries that their companies serve most frequently. Six components of LPI include:

1. Effective processes of Customs, including speed, simplicity, and predictability of formalities.
2. Quality of infrastructure, i.e. ports, railroads, roads, information technology.
3. Ease of International shipments
4. Competency of logistics services, such as transport operators and customs brokers.
5. Ability to track and trace consignments.
6. Timeliness of shipping to the consignees within the expected delivery time.

Singapore is the leader in logistics performance in the world and AEC members with an LPI score at 4.13. Malaysia ranks second in AEC with LPI score at 3.49, while Thailand is third, as shown in Table 1. Thailand is ranked at 38th out of 155 countries with score at 3.18 of 5. Brunei has no data record for LPI in World Bank. In Table 2, the performance of Thai logistics performance has dropped from rank 31st in 2007 to 35th in 2010, before ended up at rank 38th in 2012. Logistics competence, tracking and tracing and timeliness indices are the ones that contribute to decline in performance.

Table 1: Ranking of AEC countries in Logistics Performance Index*

Country	LPI World Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Singapore	1	4.13	4.10	4.15	3.99	4.07	4.07	4.39
Malaysia	29	3.49	3.28	3.43	3.40	3.45	3.54	3.86
Thailand	38	3.18	2.96	3.08	3.21	2.98	3.18	3.63
Philippines	52	3.02	2.62	2.80	2.97	3.14	3.30	3.30
Vietnam	53	3.00	2.65	2.68	3.14	2.68	3.16	3.64
Indonesia	59	2.94	2.53	2.54	2.97	2.85	3.12	3.61
Cambodia	101	2.56	2.30	2.20	2.61	2.50	2.77	2.95
Lao PDR	109	2.50	2.38	2.40	2.40	2.49	2.49	2.82
Myanmar	129	2.37	2.24	2.10	2.47	2.42	2.34	2.59

Table 2: Thailand in Logistics Performance Index in different years*

Year	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
2007	31.00	3.31	3.03	3.16	3.24	3.31	3.25	3.91
2010	35.00	3.29	3.02	3.16	3.27	3.16	3.41	3.73
2012	38.00	3.18	2.96	3.08	3.21	2.98	3.18	3.63

* Source: Logistics Performance Index, World Bank (2012)

With the upcoming AEC, Thai LSPs need to consider both as threat and opportunity. As threat, foreign investors who have high technology, excellent management skills, and overwhelming investment fund can enter market easily. Especially, Singapore LSPs and investors have much knowledge, variety of service, staff professionalism, and fund. Additionally, the AEC's new restriction for foreign investment share can be 70% in 2013. As opportunity, Thai LSPs can expand their market and become the logistics center as most of AEC countries are connected by land. Thus, road transportation would become the essential transport mode (Banomyong et al., 2008). Therefore, Thailand can use the advantage of its location that connects with half of AEC countries. In addition, majority of transportation mode used in Thailand is road, which estimates about 80% (NESDB, 2012). Moreover, local knowledge of road transportation network, local operation and activities will remain an important role in logistics business in Thailand.

The number of LSPs registered with the Department of Business Development in Thailand was 18,399 in 2011 and 80% of them are small and medium enterprises (SME) with capital investment less than five million THB (NESDB, 2012). To survive in this market in AEC, LSPs not only have to be able to satisfy the customer requirement, but LSPs also have to improve their service quality and competitive advantage. The focus of the paper is to evaluate the current service quality performance of Thai LSPs. Specifically, the objective is to perform gap analysis between LSPs perspective and industrial enterprises user perspective toward LSPs service quality so as to identify important rooms for improvement.

The next section contains literature reviews of previous research studies involving logistics performance measurement, logistics service quality, and SERVQUAL. Section 3 describes research methodology. Survey results are provided in Section 4, and finally, conclusions are discussed in Section 5.

2. REVIEWS OF LITERATURE

2.1 SERVQUAL

SERVQUAL was developed as an instrument for measuring service quality by Parasuraman et al. (1985). It was first used in marketing, and later used in other fields. Initially, SERVQUAL has ten dimensions. It has then been further developed into five generic dimensions (Udo et al. 2011) as follows:

- Tangible: appearance of physical facilities, equipment and personnel before using service
- Reliability: ability to perform promised services dependably and accurately
- Responsiveness: willingness to help customers and prompt in providing services
- Assurance: knowledge and courtesy of employees and their abilities to convey trust and confidence
- Empathy: caring, individualized attention that a service provider gives to its customers.

SERVQUAL dimensions should be used only as a basic framework. Hence, the dimensions could be modified to suit specific requirements of the services being evaluated (Gilbert and Wong, 2003). Thus, SERVQUAL is sometimes needed to be revised and refined to fit with the contexts. Below, Figure 1 illustrates a standard SERVQUAL model of perceived service quality. SERVQUAL evaluates the company performance through satisfaction of customer in each dimension by looking at the different between actual service performance that customer receive and expected service performance from words of mouth, personal needs and past experience.

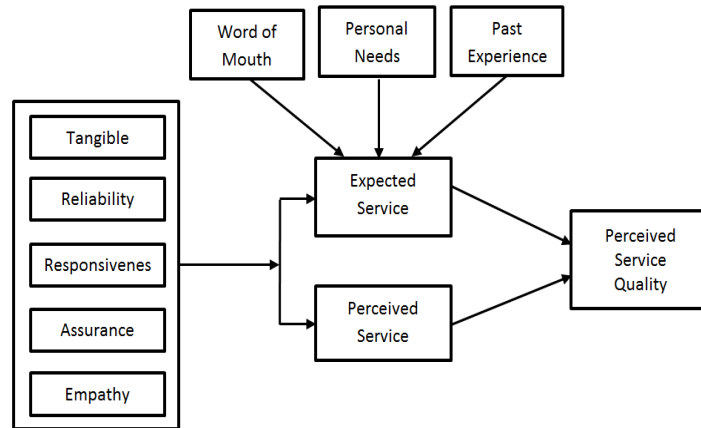


Figure 1: SERVQUAL Model

(adapted from Parasuraman et al. 1985, and Aydemir and Gerni 2011)

Parasuraman et al. (1985) defined five potential gaps in SERVQUAL model. Gap 1 measures difference between customer’s service expectation and service provider understanding of those expectations. Gaps 2-4 measure on the service provider side regarding management perception of customer’s expectation, specification of service quality, service delivery, and external communication to customers. Together, these gaps affect the actual service quality provided. Finally, Gap 5 measures between expected and perceive service quality on the customer side.

2.2 SERVQUAL in LSP Business

Banomyong et al. (2005) identified significant factors that could have influences on the process of selecting LSPs for shipping service. The results, which are “accuracy of documents” and “updated freight rates,” are regarded as the most significant factors in choosing providers.

Pakdil and Aydin (2007) developed eight service quality dimensions for SERVQUAL and demonstrated that “responsiveness” dimension is the most important one, whereas “availability” is the least important elements of service quality by studying the Turkish airline. The study also reported that the gap scores are obviously differed by the respondents’ educational levels, frequency of flight, and flight purposes, as these important variables affect their expectations and perceptions. Thantongpaiboon et al. (2008) utilized the SERVQUAL gap model and showed that the “transit time” significantly impacted on selecting ocean transport companies in Indochina market. Randheer et al. (2011), however, used the SERVQUAL as an instrument for highlighting the points that are needed to be improved and efficient in public transport services. The study reveals that the expectations of users drive the public transport to focus on services as the competitive global business environment. While the customers’ expectations are gradually increased, the service providers could meet those expectations if they are sensitive to customers’ issues enough. Therefore, public transport services have to understand the core responsibility of providing services consistently, which would yield better results in term of service quality. In the same year, Goh et al. (2011) studied on shipping sector and suggesting that the “insufficient commitment standards” and the “ambiguity in processes” are issues related to unsatisfied customers’ expectation.

3. RESEARCH METHODOLOGY

The major research instrument includes personal interview using questionnaire forms during the data collection phase. Then, statistical analyses are used to analyze the data.

3.1 Questionnaires

Two semi-construct questionnaire forms, LSPs and user forms, are developed. During development process, the questionnaires are pretested by in-depth interviews with experts from academic institute and five experts from several industrial organizations. After adjustment and revisions, a pilot test on the questionnaires is conducted with a focus group for the final tune-up and preliminary data analysis (i.e. reliability test). Then, the final forms of questionnaires are used to collect data from the perspective respondents (LSPs and users) via personal interviews, phone interviews, postal mail, and e-mail.

Each of the two questionnaire forms contain two main parts that are used in this study. The first part is general demographic information and the second part is about service quality (SERVQUAL) evaluation. In the SERVQUAL part, LSPs' service quality is evaluated in terms of expected performance (E) and perceived performance (P), by the LSP respondents (self-evaluation) and by their users. Five-point likert scale is used to rate the service quality ranking from the value of 1 (poor performance) to 5 (excellent performance). Cronbach's alpha is used for reliability test in this study. The values are greater than 0.8 for both forms indicating the questionnaires are reliable.

3.1.1 LSP questionnaire form

The first part contains 15 questions for collecting general information about LSP companies, including:

- Demographic information of the organization and respondent, authorized capital, nationality of the company, annual income, number of employees and their education level
- Criteria for choosing other LSPs as subcontractor
- Assets of the company and outsource company which are classified into two types: (1) physical facilities, and (2) information technology and software system, equipment, and devices that facilitate the services e.g. RFID, GPS tracking, barcode, e-customs, etc.
- Types of services offerings, i.e. customs, warehousing, road transport, rail transport, air transport, in-land waterway transport, coastal and ocean transport, consulting services, value-added services, such as labeling, packaging, and others.
- Competitive advantages provided to customers, and key performance indicator (KPI) included in the service agreements.
- Method for receiving and handling customers' complaints
- Logistics strategies of the company in the short term, intermediate, and long term.

The second part of LSP form is for SERVQUAL. There are 26 items, each of which measures a service quality aspect from the five SERVQUAL dimensions: five items each for Tangibles, Reliability, Responsiveness, and Empathy, and six items for Assurance.

3.1.2 User questionnaire form

Similar to the LSP form, the first part contains general information of the industrial enterprise user, including:

- Demographic information, industrial sectors, market proportion of revenue, authorized capital, annual revenue and current number of employees.
- Reasons for outsourcing logistics activity, channels for finding LSP, and factors in choosing LPS.
- Types and proportion of logistics services used.
- Estimated percentage of logistics cost per revenue.

The SERVQUAL part of the user form is the same as that of the LSP form.

3.2 Data Collection

Data collection was performed from December 2012 to March 2013 at on-site interviews, related seminar and exhibitions, organized workshop, and focus group. The total number of responses is 190 respondents. After screening, there are 162 responses with complete information, 72 of which are from LSPs and 90 from users.

3.3 Gaps in Service Quality

Gap analysis is suitable for company applying and distinguishing which processes need to be improved. SERVQUAL gap model was introduced by Parasuraman et al. (1985) which consist of five gaps. For this study, only Gaps 1, 3, and 5 are of interested, and are rearranged into new order as shown in Figure 3.

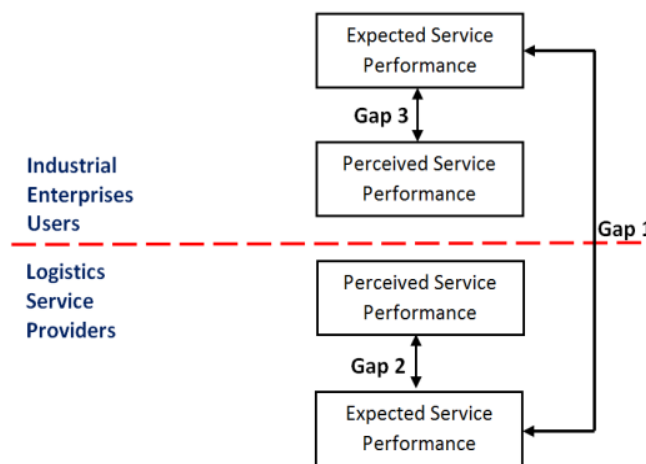


Figure 3: The measured gaps in SERVQUAL model

Gap 1 involves the communication between LSPs and users regarding the service quality expectation. That is, this gap compares the expectation score from the LSP form and the expectation score from the user form. Gap 2 is for measuring service performance before service (expected performance) and actual service (perceived performance) from LSPs perspective, i.e. comparing performance and expectation score from LSP form. Finally, Gap 3 measures service quality from user perspective. It is similar to Gap 2, but the data are taken from the user form.

3.5 Data analysis

Two statistical analyses including ANOVA and Chi-square test were conducted. ANOVA is conducted by using the expectation and performance scores from both questionnaire forms as the response. The factors include the following:

- (1) P-E: a factor indicating whether a score is from performance score or expectation score.
- (2) LSP-User: a factor indicating whether a score is from LSP form or user form.
- (3) ServQual: a factor indicating the five dimensions of SERVQUAL
- (4) Item(ServQual): a factor indicating 26 questions in the SERVQUAL section. This factor is nested within ServQual factor, i.e. Questions 1-5, 6-10, 11-15, and 22-26 are for Tangibles, Reliability, Responsiveness, and Empathy, respectively; and Questions 16-21 are for Assurance.

- (5) Respondent(LSP-User): A block effect indicating the respondent that the score come from. This is also a factor nested within LSP-user factor, i.e. respondent No. 1-72 are LSPs, and respondent No. 73-162 are users.

A small p-value from an F-statistic in ANOVA would indicate that a factor is significant. The three Gaps are evaluated using a Tukey’s multiple comparisons on the average score grouped by the interaction term between E-P and LSP-user. With Tukey’s comparisons, there are six possible pairwise comparisons, three of them that capture the three Gaps are of interest. That is, for each item of the SERVQUAL dimensions, the hypotheses tested are as given below:

$$\text{Gap 1: } H_0: \mu_{E,LSP} = \mu_{E,user} \text{ vs. } H_1: \mu_{E,LSP} \neq \mu_{E,user}$$

$$\text{Gap 2: } H_0: \mu_{P,LSP} = \mu_{E,LSP} \text{ vs. } H_1: \mu_{P,LSP} \neq \mu_{E,LSP}$$

$$\text{Gap 3: } H_0: \mu_{P,user} = \mu_{E,user} \text{ vs. } H_1: \mu_{P,user} \neq \mu_{E,user}$$

Where $\mu_{E,LSP}$ denote the average expectation score of an item from LSP form, and so on.

The 2nd analysis, Chi-square test, is an alternative to ANOVA. One major condition for using ANOVA is that the response (evaluation score), which is 5-point Likert scale, is treated as if they are numerical and continuous response. Although this condition may not be completely satisfied because the response is discrete (i.e. ordinal), ANOVA is still a popular choice for data analysis. Nevertheless, a Chi-square test, which is appropriate for discrete data, is also performed in addition. Based on the Chi-square tests, the three Gaps are evaluated by comparing the *percentage* distribution of the 5-point Likert scale vs. the factor of interest in a Gap. For example, for Gap 1, the comparison will be made in the form as shown in Table 3.

Table 3: Example of a gap analysis for Gap 1 using Chi-square test

An item in SERVQUAL dimension	Performance score (1 = poor, 5 = excellent)				
	1	2	3	4	5
Expectation score from LSP form	$p_{1,LSP}$	$p_{2,LSP}$	$p_{3,LSP}$	$p_{4,LSP}$	$p_{5,LSP}$
Expectation score from user form	$p_{1,user}$	$p_{2,user}$	$p_{3,user}$	$p_{4,user}$	$p_{5,user}$

From Table 3, let $p_{1,LSP}$ denote the percentage of LSP who rate the item with a score of 1, and so on. With the Chi-square test, Gap 1 is significant, if the distribution of $p_{1,LSP}, p_{2,LSP}, \dots, p_{5,LSP}$ is significantly different from the distribution of $p_{1,user}, p_{2,user}, \dots, p_{5,user}$.

An advantage of Chi-square is that it can capture the true nature of the response, which is discrete. However, ANOVA has an advantage that it can evaluated all 26 items for all three Gaps all at once, so there is one type I error from ANOVA test, whereas Chi-square needs 26 tests for each Gap, i.e. a total of 78 p-values. Thus, there is more probability of type I error. In this paper, both analyses are performed complementarily and the results are used together to evaluate whether a gap in each item is significant.

4. RESULTS

4.1 Respondent Profile

Demographics of respondents participating in the survey (LSPs and users) are summarized in Tables 4-6. General demographic information of both groups is in Table 4. More than half of the respondents are located in the Central region and are small size companies, which are good representatives of the overall LSP industry and their users in

Thailand. Table 5 summarizes the types of service provided by LSPs by percentage. The top three logistics services are road transport, followed by customs, and warehousing.

Table 4: Respondent demographics

Characteristics	Percentage		Characteristics	Percentage	
	LSPs	Users		LSPs	Users
Region			Position		
Northern	8%	2%	Owner/CEO/Vice President	34%	9%
Northeast	14%	3%	Manager	23%	21%
Central	51%	71%	Assistant manger	6%	3%
East	6%	6%	Supervisor	13%	7%
Southern	8%	2%	Other	15%	44%
Not specified	13%	16%	Not specified	10%	16%
Capital			Revenue		
0-50 Million (Small)	63%	42%	0-50 Million (Small)	31%	23%
51-200 Million (Medium)	3%	16%	51-200 Million (Medium)	10%	12%
More than 200 million (Large)	3%	24%	More than 200 million (Large)	4%	46%
Not specified	31%	18%	Not specified	55%	19%

Table 5: Summary of LSPs’ responses

Service offering to customers	Percentage
Road transport	75%
Customs	38%
Warehouse	32%
Value-added services, e.g. labeling, packaging	17%
Air transport	15%
Costal and Ocean transport	13%
Consulting services	13%
Rail transport	4%
Inland waterway transport	1%
Others, e.g. IT, 4PL	4%

From the user side (Table 6), the respondents are from more than 15 important industrial sectors, which is a well coverage of the users. The main reasons for outsourcing logistics services to LSPs are to reduce logistics cost and to obtain professional services. For users, words of mouth and internet are the most important channels for finding LSPs. Moreover, most services hired are for transportation and customs clearance. The percentages of both services are very consistent with the LSPs data in Table 4 on most services provided.

4.2 SERVQUAL

Analysis results of the three gaps are presented in Table 7 (ANOVA) and Table 8 (Tukey’s test and Chi-square test).

From the ANOVA, some effects (main effects and 2-way interactions) are significant. However, our main research questions are to evaluate the three Gaps for each of the 26 items. Thus, the term to be evaluated further using Tukey’s multiple comparisons is the 3-way interaction among LSP-user, E-P, and Item(SERVQUAL). Tukey’s results along with p-value from the Chi-square tests are summarized in Table 8

Table 6: Summary of users' responses

Industrial sectors	Percentage
Agro-industry, food, beverages	14%
Leather products and foot ware	3%
Metal work	4%
Textile and garments	2%
Wood products and furniture	7%
Ceramics and glasses	2%
Gems and Jewelry	3%
Rubber and rubber products	4%
Plastics products	2%
Pharmaceutical and chemical	13%
Oil/petrochemical products	1%
Automotive and auto parts	12%
Appliances and electronics	9%
Paper and paper products	1%
Printing/publishing products	2%
Others, e.g. banking, construction Equipment	18%

Market proportion	Percentage
Domestic	74%
ASEAN	34%
ASIA excluding ASEAN	17%
Others	20%

Reasons for outsourcing	Percentage
Reducing logistics cost	58%
Obtaining services	51%
Concentrate on core business	24%
Expanding the market	19%

Typed of services	Percentage
Transportation	77%
Customs	40%
Warehouse	24%
Value-added service	10%
Sourcing	6%

Channels in finding LSPs	Percentage
Words of mouth	51%
Internet	50%
Exhibition/Trade fair	22%
Social network, e.g. LinkedIn	20%
Magazine	8%
Newspaper	7%
Leaflets/Brochure	6%

Factors in choosing an LSPs	Rank
Overall service quality	1
Service value	2
Company reputation	3
Types / varieties of services	4
Document accuracy	5
Potential for long term relationship	6

Table 7: ANOVA results

Source	DF	Seq SS	Adj SS	Adj MS	F	P-value
P-E	1	164.733	132.316	132.316	369.010	0.000
LSP-User	1	399.304	401.121	401.121	1118.660	0.000
ServQual	4	8.638	7.887	1.972	5.500	0.000
Item(ServQual)	21	120.834	123.301	5.871	16.370	0.000
Respondent(LSP-User)	160	2051.495	2017.325	12.608	35.160	0.000
P-E*LSP-User	1	81.539	80.884	80.884	225.570	0.000
P-E*ServQual	4	0.945	1.070	0.267	0.750	0.561
P-E*Item(ServQual)	21	11.247	11.261	0.536	1.500	0.068
P-E*Respondent(LSP-User)	160	696.338	696.101	4.351	12.130	0.000
LSP_User*ServQual	4	7.373	7.039	1.760	4.910	0.001
LSP_User*Item(ServQual)	21	15.206	14.553	0.693	1.930	0.006
ServQual*Respondent(LSP-User)	640	687.342	686.964	1.073	2.990	0.000
P-E*LSP-User*ServQual	4	2.513	2.605	0.651	1.820	0.123
P-E*LSP-User*Item(ServQual)	21	10.541	10.541	0.502	1.400	0.105
Error	7217	2587.811	2587.811	0.359		
Total	8280	6845.860				

Table 8: Summary of gap analysis results for SERVQUAL from Tukey’s comparisons and Chi-square tests

Dimensions	Gap 1				Gap 2				Gap 3			
	E-LSP	E-user	Tukey	Chi-Sq	P-LSP	E-LSP	Tukey	Chi-Sq	P-user	E-user	Tukey	Chi-Sq
Tangible												
Appearance of physical facilities	4.17	4.06		0.868	4.29	4.17		0.198	3.54	4.06	**	0.003*
Availability of resource	4.38	4.10		0.131	4.40	4.38		0.950	3.66	4.10	**	0.001*
Utilization of resources	4.03	3.97		0.745	4.12	4.03		0.683	3.58	3.97	**	0.011*
IT system and capability	4.12	3.88		0.184	3.69	4.12		0.034*	3.40	3.88	**	0.018*
Staff sufficiency	4.38	4.16		0.694	4.24	4.38		0.503	3.56	4.16	**	0.001*
Reliability												
Basic services	4.31	4.07		0.625	4.31	4.31		0.040*	3.64	4.07	**	0.006*
Value-added service	3.98	3.71		0.036*	3.77	3.98		0.490	3.36	3.71		0.068
Document	4.31	4.06		0.145	4.24	4.31		0.805	3.63	4.06	**	0.005*
Time	4.54	4.24		0.181	4.40	4.54		0.735	3.80	4.24	**	0.001*
Safety	4.58	4.69		0.138	4.48	4.58		0.872	3.79	4.69	**	0.001*
Responsiveness												
Provide enough information to customers	4.41	4.03	**	0.005*	4.14	4.41		0.026*	3.53	4.03	**	0.003*
Fast and easy ordering process	4.32	4.05		0.168	4.18	4.32		0.572	3.61	4.05	**	0.037*
Fast document processing	4.31	4.14		0.489	4.21	4.31		0.585	3.64	4.14	**	0.002*
Ability to provide short service time	4.30	3.94	**	0.018*	4.31	4.30		0.857	3.57	3.94		0.215
Quick respond to customer claims	4.29	4.02		0.198	4.22	4.29		0.861	3.45	4.02	**	0.009*
Assurance												
Reputation/credibility of LSPs	4.27	4.14		0.239	4.46	4.27		0.193	3.80	4.14		0.093
Compliance to standards	3.98	3.95		0.151	3.87	3.98		0.063	3.62	3.95		0.177
Clear policy on warranty, security	4.22	4.17		0.530	4.29	4.22		0.760	3.66	4.17	**	0.007*
Regular performance review	4.10	3.91		0.469	3.98	4.10		0.608	3.58	3.91		0.147
Staff competency	4.12	4.11		0.035*	4.06	4.12		0.475	3.45	4.11	**	0.000*
Staff professionalism	4.44	4.20		0.186	4.43	4.44		0.659	3.63	4.20	**	0.000*
Empathy												
Understanding specific customers' needs	4.40	4.12		0.164	4.44	4.40		0.504	3.45	4.12	**	0.000*
Ability to accommodate special needs	4.28	3.85		0.008*	4.19	4.28		0.649	3.43	3.85	**	0.015*
Flexibility in adapting to customer needs	4.18	4.00		0.314	4.19	4.18		0.708	3.59	4.00	**	0.079
Personal attention	4.36	3.99		0.030*	4.32	4.36		0.439	3.54	3.99	**	0.023*
Assessing customers' future needs	4.08	4.08		0.099	4.19	4.08		0.187	3.45	4.08	**	0.000*

Note: * indicate small p-value from Chi-square test, and ** indicate significant gap from Tukey’s comparisons

4.2.1 Gap 1

From the results, LSPs seem to understand their users’ expectation in Tangible dimension well because there is no gap in all items from both ANOVA and Chi-square tests. However, in the other four SERQUAL dimension, there are 1-2 items that have small p-values indicating statistical significant gaps. For example, the first item in Responsiveness, “provide enough information to customers,” is an item with significant gap from both ANOVA and Chi-square test. A closer look at the mean expectation scores from LSPs and that of the users for these items reveals that these gaps are relatively unimportant because all significant differences come from LSPs overestimating the user expectations, which should not be an issue in term of understanding service quality.

4.2.2 Gap 2

Gap 2 measures the difference between user expectation and the quality of service provided from LSP perspectives. In other words, a significant gap implies that LSPs think they perform under expectation in that item. The results from ANOVA show that none of the items has a gap. However, Chi-square tests show significant gaps in three items: IT system capability (Tangible), basic services (Reliability), and providing enough information for customers (Responsiveness). A closer look at the scores shows that there are the first two gaps are important because these items have lower performance scores than expectation scores. That is, LSPs think that they underperform both in terms of their IT system capability and the reliability of their basic services.

For the “providing enough information” item, although the p-value from Chi-square test is small, the gap is not important. This is because the gap simply comes from the differences in the percentages of responses, between performance and expectation, that give rating score of 4 and 5, which is not that much of a difference (see Table 9).

Table 9: Percentage distribution of a significant gap in a Responsiveness item

Provide enough information to customers	Performance score (1 = poor, 5 = excellent)				
	1	2	3	4	5
Performance in LSP perspective	0%	1%	6%	54%	39%
User expectation in LSP perspective	1%	0%	17%	34%	47%

4.2.3 Gap 3

This is the most important gap because it measures the expectation and perception of service quality received from user perspective towards LSPs service performance. From the results, both ANOVA and Chi-square tests indicate that all items in all dimensions are significant except five items which include value-added services (Reliability), short service time (Responsiveness), LSPs reputation, standard and certification, regular performance review (Assurance). Additionally, flexibility in customer need (Empathy) only appears significant from the Chi-square test.

4.2.4 Discussion

The results in Table 6 can be categorized into three cases according the significance of Gap 2 and Gap 3. Note that Gap 1 is not considered further because the significant gaps only come from LSPs overestimating the user expectation, which is not a concern.

Case 1 involves service quality aspects having small p-value for both Gap 2 and Gap 3, and without LPSs overestimating the user expectation. There are two service quality aspects that fall into this case: IT system capability (Tangible) and basic services (Reliability).

These are the aspects which both LSPs and user agree that they have significantly lower service quality performance than expectation. Thus, LSPs should consider them as the highest priority rooms for improvement. For IT system, LSPs should consider add capability such as Global Positioning System (GPS) for customer for tracking and tracing their products, RFID instead of barcode, and software systems for transportation management and warehouse management, etc. This will unavoidably involve significant investment. Therefore, LSPs should ensure that the added capability align with their core service that will make them serve customers better. For basic services, LSPs should focus on improving their processing service (e.g. order fulfillment process), truck efficiency (e.g. loading and unloading, pickup and delivery) and warehouse operation (e.g. storing, order picking, consolidation and sorting).

Case 2 contains 18 service quality aspects (out of a total of 26) whose Gap 2 is not significant but Gap 3 is significant. These are the ones that LSPs do not see any problem in their service quality, while the users think that LSPs cannot satisfy their expectation. Table 10 lists the service quality aspects in Case 2. LSPs should find out the causes of these different viewpoints. For example, inconsistencies may be a result of insufficient or ineffective communication between LSPs and users, LSPs inflexibility, not enough service variety, or a real low service quality from LSPs.

Table 10: Service quality aspects of SERVQUAL in Case 2

Tangible	Reliability	Responsiveness	Assurance	Empathy
<ul style="list-style-type: none"> - Appearance of physical facilities - Availability of resource - Utilization of resource - Staff sufficiency 	<ul style="list-style-type: none"> - Document - Time - Safety 	<ul style="list-style-type: none"> - Fast and easy ordering process - Provide enough information to customers - Fast document process - Quick respond to customer claims 	<ul style="list-style-type: none"> - Clear policy on warranty and security - Staff professionalism - Staff competency 	<ul style="list-style-type: none"> - Understanding specific of customers' need - Ability to assess customers' future needs - Ability to accommodate special needs - Personal attention

Case 3 are the ones that both Gap 2 and Gap 3 are not significant, which implies that both LSPs and users agree that service quality provided and received are satisfactory. There are six items in this case including value-added service (Reliability); ability to provide short service time (Responsiveness); LSP's reputation, compliance to standards and regular performance review (Assurance); and flexibility in adapting to customer needs (Empathy). All six aspects do not have a gap mainly because of lower expectation of users towards LSPs' service quality in these aspects. For example, value-added services (see Table 5) have only ten percent of this type of service, because in Thailand both LSPs and users still use the traditional logistics services. Short service time is another example that has low expectation from users due to *known* and *expected* traffic problems in Bangkok area. Although these aspects have no gaps in service quality, LSPs still need to maintain the service quality and find possible ways for improvement.

5. CONCLUSION

This paper presents results from a survey study on service quality of Thai LSPs. Two statistical analyses are used to identify gaps in service quality aspects based on SERVQUAL model. The results show that LSPs seems to understand their users' expectation well. Two service quality aspects, including IT system capability and reliability in basic services, are identified as the most important ones to improve. Other 18 service quality aspects are found to have inconsistent views between LSPs and users, i.e. LSPs perceive that there are no gaps in

these aspects, whereas users see significant gaps. These items need further investigation to find out the cause of the inconsistency.

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REFERENCES

- Aydemir, S.D., and Gerni, C. (2011) Measuring Service Quality of Export Credit Agency In Turkey By Using Servqual, *Procedia Social and Behavioral Sciences*, **24**, 1663-1670.
- Banomyong, R., Ritthirong, N., and Varadejsatitwong, P. (2005) Selecting logistics providers in Thailand: A shippers’ perspective, *Proceeding of the 10th International Symposium on Logistics 3-5 July 2005, Lisbon*, 568-573.
- Banomyong, R., Sopadang, A. and Ramingwong, S. (2009) Assessing Thailand’s Logistics Potential in the Greater Mekong Sub-Region: The Case of the North-South Economic Corridor, *APIEMS*.
- Department of Business Development (2012)
http://www.nesdb.go.th/Portals/0/tasks/dev_logis/seminar/logis54/data05.pdf
- Department of Trade Negotiations (2012)
<http://www.dtn.go.th/filesupload/aec/images/logis29-05-55.pdf>
- Ghobadian, A., Speller, S. and Jones, M. (1994) Service Quality: Concepts and Models, *International Journal of Quality and Reliability Management*, **11**, 43-66.
- Gilbert, D., and Wong, R.K.C. (2003) Passenger expectations and airline service: a Hong Kong based study, *Tourism Management*, **24**, 519–532.
- Goh, M., Desouza, R. and Garg, M. (2011) Assessing trade friendliness of logistics services in ASEAN, *Asia Pacific Journal of Marketing and Logistics*, **23**, 773-792.
- Kettinger, W.J., and Lee, C.C. (1994) Perceived service quality and user satisfaction with the information services function, *Decision Sciences*, **25**, 737-766.
- Lai, K.H., Ngai, E.W.T., and Cheng, T.C.E. (2002) Measures for evaluating supply chain performance in transport logistics, *Transportation Research Part E*, **38**, 439-456.
- Mentzer, J.T., Myers, M.B., and Cheung, M.S. (2004) Global market segmentation for logistics service, *Industrial Marketing Management*, **33**, 15-20.
- Office of the National Economic and Social Development Board (NESDB) (2012) Thailand’s Logistics Report 2011,
http://www.nesdb.go.th/Portals/0/tasks/dev_logis/report/data_1255030412.pdf.
- Pakdil, F., and Aydin, O. (2007) Expectations and perceptions in airline services: An analysis using weighted SERVQUAL scores, *Journal of Air Transport Management*, **13**, 229-237.
- Parasuraman, A., Zeithaml, V.A., and Berry, L.L. (1985) A Conceptual Model of Service Quality and Its Implications for Future Research, *Journal of Marketing*, **49**, 41-50.
- Randheer, K., AL-Motawa, A., and Vijay, P. (2011) Measuring Commuter’s Perception on Service Quality Using SERVQUAL in Public Transportation, *International Journal of Marketing Studies*, **3**, 1.
- Thantongpaiboon, C., and Wassusri, T. (2008) Ocean Transport service quality assessment, *Proceedings of the 13th International Symposium on Logistics*.
- Too, L., and Earl, G. (2009) “Public Transport Service Quality and Sustainable Development: a Community Stakeholder Perspective, *Sustainable Development*, **18**, 51-61.

- Udo, G.J., Bagchi, K.K., and Kirs, P.J. (2011) Using SERVQUAL to assess the quality of e-learning experience, *Computers in Human Behavior*, **27**, 1272-1283.
- Yee, H.L., and Daud, D. (2011) Measuring Customer Satisfaction in the Parcel Service Delivery: A Pilot Study in Malaysia, *Business and Economic Research*, **1**, 2162-4860.