



LOGISTICS SERVICE QUALITY EVALUATION USING KANO ON GAP ANALYSIS MODEL

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Abstract

In term of delivery service industry, it has various types of services. Today the trend of logistics and delivery services having dramatical shifting. In responding what consumer need of the delivery service, knowing the dimension and criteria which drive the service quality is very important. In this paper, the study is focus on the evaluation of service quality value carried by the logistic & delivery service at last-mile delivery. The observation done by retrieving the data through questionnaire with 58 valid respondents & various demographic background, and 1 logistics & delivery service company. The evaluation done by using KANO Model, there are 3 quality dimension with 20 criteria been evaluated. The analysis took after the evaluation process by adopting the SERVQUAL Gap Analysis Model, all the 20 criteria then analyse using Gap-1 analysis. The analysis result divided into 3 aspects, the Positive Gap analysis with 13 criteria grouped as positive value for the logistics company; the Negative Gap analysis with 2 criteria grouped as negative value for the logistics company; and 1 service quality dimension 'System Quality' defined as the dimension need to be improved for the logistics company to meet what customer needs.

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1. INTRODUCTION

The logistic industry is always growing with all the innovative services offered. In term of delivery service industry, it has various types of services. Package delivery or parcel delivery is the delivery of shipping containers, parcels, or high value mail as single shipments. The service is provided by most postal systems, express mail, private courier companies, and less than truckload shipping carriers (1). With all the causing factors, last-mile delivery or exactly parcel delivery has received very large market in the logistic service environment. Not only is the market large, but it's also highly dynamic, with growth rates in 2015 of between 7 and 10 percent in mature markets (such as Germany and the United States) and more than 100 percent in developing markets (2).

On the logistic industry, the term of service providers is divided into several categories defined on who is the providers. There are 1st party logistics (1PL), and it's categorized respectively until 4th party logistics (4PL). In the last mile delivery environment, 3PL is play the most important role. Third-party logistics providers (3PL) include freight forwarders, courier companies, as well as other companies integrating & offering subcontracted logistics and transportation services (3). The large market on the last-mile delivery environment has intriguing the start-ups in recent years. Some of these companies are using technology to tap into the 'sharing economy' by matching available capacity with delivery needs, while the investments by traditional LSPs in digital logistics start-ups only constitute around 6% of overall venture capital flows (4). This competition drives every player on the delivery service sectors to become more sensitive in responding what consumer needs.





In responding what consumer need of the delivery service, knowing the dimension and criteria which drive the service quality is very important. It has been widely recognized that logistic quality is the foundation of logistics enterprises and the level of logistics service provided by those enterprises determines customer's satisfaction, thus determining their competitive edge over other competitors (5). The entrants of online transportation-based logistics service provider, create more complex nature of service. It has distinct services process, involves inseparable physical services (i.e. drivers, vehicle, etc.) and the user's tendency to use the services repeatedly (6). Therefore, to know what consumer expect towards the service quality perceived by conventional and online-based logistics service provider is important, in-order-to shape better delivery service environment in current-future era.

It appears that there has been very little research done in logistics service on how its quality is defined and attributed (5). The use of proper tools and method to evaluate and analyze the quality is still researchable.

This paper aims to evaluate what consumer needs towards the quality of delivery service. Then analyze the gap of what they expect, with the quality perceived by conventional and online based transportation courier. This paper starts with a literature review and the proposed model of service quality in logistics with specific dimensions and built-in items derived from general logistics quality and online service quality. The methodology is described next, followed by analyses and discussions on research findings. Conclusion and comments are presented, and future research directions suggested to sum up this research.

2. Literature Review

2.1. Model of Delivery Services and The Transportation Mode Evolution

For centuries, the mode to deliver goods and logistics has practically by using vehicles. It applied on any kind of transportation mode which land-vehicle, water and sea transportation, and air cargo. For the recent years on the millennium era, the trends of delivery model have shifted or literally has change a lot. Lot of innovation caused by rapid technology development gives lot of impact on logistics and delivery ecosystem, especially for the mode of transporting the goods. Many researches has done to learn the effectiveness and efficiency of the model. Alison Conway et al. (7) measured the performance and impacts from the use of cargo cycles in New York, which result cargo cycles can provide environmental benefits and offer a competitive last-mile delivery option for some local operators in very congested cities.

Other trends for the last decades is the technological development on self-collection, where Piplani and Saraswat (2012) on Kum Fai Yuen (8) defines it as the involvement of provision of a network of service points where operators pool and deliver their consignees' parcels, and consignees pay, collect or return their parcels. They defines 3 perspective of benefits associated with adopting self-collection delivery services over home deliveries which operators' perspective, societal and environmental perspective, and consumers' perspective (8). For the last decade, the mode of online transportation has extremely growing. The company like Uber from US and the major player like Grab and Go-Jek has disruptively joining the market of logistics and delivery services. Where as Jenita (2012) cited on Rizky Septiani et al. (9) define online transportation as a transportation service which all transactions are done online by using smartphone, related application, and internet.

Another for the past decades is collaborative urban logistics, Lambert et al. (1999) as cited on Hyeonjun Park et al. (10) explained Logistics collaboration is understood as a tailored business relationship based on mutual trust, openness, shared risk, and shared reward yielding a competitive advantage resulting in business performance greater than firms would achieve individually. An unique model has developed for recent years which called as crowd-tasking model, where large pool of citizen workers are used to perform the last-mile delivery (11).





2.2. Logistics Service Quality

The importance of creating proper service quality on company will makes the customer satisfy towards the services. According to Saura et. al (2008) on Kamble Sachin et. al (12), logistic service quality is crucial and having major impact for customer satisfaction. Therefore, to understand what customer needed and how it perceived is could be the solution to comprehend the gap between them. Objective matrix method (OMAX) applied to measure the logistic service performance and resulting 3 criterion which are time berthing; effectiveness; and depreciation (13). While Heru Winarno (14) doing the research about service quality using Service Quality (Servqual) method and Importance Performance Analysis (IPA) with the result of some characteristics intangibility; variability; perishability; and inseparability for performance dimension and tangibles; reliability; responsiveness; assurance; and empathy for quality dimension. These characteristics applied to any logistics services and dynamically growing with trend of industries. To match what customer needs in order to improve the service offered, its required study about logistic service quality.

3. Methodology

In this research methodology, the process and materials defined how the research is conducted. Figure 1 show the process of this research.

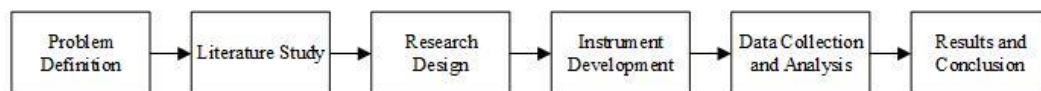


Figure 1. Research Process

The survey and observation are conducted in this research as the quantitative approach. The data collection is distributed using various platform on the internet and also using on-the-field survey, whilst the observation conducted by interviewing the head of marketing or any strategic position at the regional office of logistic service provider in Yogyakarta. The deployed questionnaire contains the information of respondent demographics, and likert scale statement of service criteria to be analysed is represents next.

In collecting the data, an online deployment done along with the on-field observation. As for the analysis, the KANO evaluation model is use in the adoption of The Gap Analysis Model. The implementation of Gap Analysis model is partial, which mean only Gap 1 will be analyse from 5 Gaps existed. This reasoning is made to focus the evaluation only between the customer's expectation and the provider's perception on the customer. The consideration to use KANO implemented at the Gap Model, because by comparing the difference between customers' perspective and service provider's perspective will give clear understanding within simpler way and more specifics -thru the dimensional carried by the KANO itself. The process result is then analysed. The comparison provides to show the different and the gap exists between what the customer expects on the provided services by the Logistic Service Provider, and what is the perception of the LSP towards the customer's expectation. The analysis will show the current condition of service quality fulfilment at the logistics market and tells which criteria of service quality should have an improvement.

4. Results and Discussion

4.1. Data Collection Results

- 4.1.1. *Respondents Demographic.* The respondents for this study is people live in Yogyakarta area and has experiences in using any of logistics services, with also have any expectation towards the service quality of the logistics offered. The number of respondents from customer perspective is 62 with 4 among them gave



4.1.2. *Criteria Assessment.* This study concern on developing the measurements model which include both the services aspect and technological aspect. The identified criteria based on several previous studies which mainly referred from Salameh and Hasan (2015), Huang et al. (2015), and the rest is from the field observation

Table 2. Logistics Service Quality Dimensions and Criteria Considering Technology Development

Dimensions	Criteria	
Service Quality	Staff Performance	Perceived Risk
	Order Placement Flexibility	Compensation
	Safety & Security	Payment Facility
	Delivery Speed Service	Low-cost Service
	Company Reputation	Service Capacity
	Responsiveness	Service Coverage
Information Quality	Information Reliability	Privacy
	Tracing Capability	Documentation Reliability
System Quality	Online Platform Availability	Accessibility
	Ease of Use	Innovative Online Platform

4.2. *KANO Evaluation*

4.2.1. *Customers' Perspective Evaluation.* The result given that between 20 criteria, fifteen of them categorized as Attractive features; three of them are Performance features; and the rest two criteria are Indifferent features. Because all of criteria categorized or plotted on the positive quadrant (figure 3) -above 0 value. Then all of the criteria are considered and placed on the categorization plane (figure 4) without any exclusion.

4.2.2. *Logistics & Parcel Delivery Service Provider's Perspective.* While from the Logistics Service Provider perspective, the evaluation found quite significant difference towards the customers perspective. The result given that between 20 criteria, four of them categorized as Attractive features; eleven of them are Performance features; two criteria are Indifferent features; and the rest three of them are must-be features. Because the data was observed from single logistics service provider, the data will not giving any error values and doesn't required standard deviation calculation. The result is absolutely plotted at the positive quadrant.

Table 3. Continuous Analysis Categorization Table of Consumer Response

Criteria	Code	Functional (Y)	Dysfunctional (X)	Importance	Std. Deviation (Y)	Std. Deviation (X)	Category
Staff Performance	C1	3.07	2.00	7.79	1.31	1.78	A
Information Reliability	C2	3.04	1.72	7.87	1.51	1.75	A
Tracing Capability	C3	3.07	2.00	8.09	1.54	2.04	A





Order Flexibility	Placement	C4	2.66	1.19	7.51	1.60	1.66	A
Safety & Security		C5	3.21	3.04	8.40	1.35	1.98	P
Documentation Reliability		C6	1.98	2.00	7.68	1.70	2.02	I
Company Reputation		C7	2.88	1.87	7.60	1.63	1.88	A
Online Availability	Platform	C8	2.96	1.12	7.37	1.63	1.59	A
Responsiveness		C9	3.18	2.00	7.82	1.51	1.83	A
Perceived Risk		C10	1.13	0.65	7.78	1.97	1.93	I
Privacy		C11	3.02	2.53	7.83	1.54	1.87	P
Compensation		C12	3.00	2.46	7.88	1.60	2.07	P
Payment Facility		C13	3.08	1.52	7.48	1.63	1.71	A
Ease of Use		C14	2.87	1.23	7.49	1.59	1.73	A
Accessibility		C15	3.08	1.44	7.68	1.55	1.60	A
Innovative Platform	Online	C16	3.04	1.16	7.24	1.59	1.65	A
Low-cost Service		C17	3.28	1.54	7.64	1.55	1.72	A
Delivery Speed Service		C18	3.31	1.90	8.10	1.59	1.84	A
Service Capacity		C19	2.94	1.02	7.39	1.77	1.57	A
Service Coverage		C20	3.22	1.47	7.92	1.50	1.65	A

Table 4. Continuous Analysis Categorization and Assessment Table of Service Provider Response

Criteria	Cod e	(Y)	(X)	(I)	Cat .	Criteria	Cod e	(Y)	(X)	(I)	Cat .
Staff Performance	C1	4	4	9	P	Privacy	C11	2	4	9	M
Information Reliability	C2	4	4	9	P	Compensation	C12	2	4	7	M
Tracing Capability	C3	4	4	9	P	Payment Facility	C13	2	4	7	M
Order Placement	C4	4	4	7	P	Ease of Use	C14	2	2	5	I
Flexibility											
Safety & Security	C5	4	4	9	P	Accessibility	C15	4	2	7	A
Documentation Reliability	C6	4	4	9	P	Innovative Online Platform	C16	4	2	7	A
Company Reputation	C7	4	2	7	A	Low-cost Service	C17	4	4	7	P
Online Platform	C8	2	2	7	I	Delivery Speed Service	C18	4	4	9	P
Availability											
Responsiveness	C9	4	4	9	P	Service Capacity	C19	4	2	7	A
Perceived Risk	C10	4	4	9	P	Service Coverage	C20	4	4	9	P

(Y) Functional; (X) Dysfunctional; (I) Importance; (Cat.) Category





by having the Online Platform and made it Easy to Use for their business would give no impact for fulfilling the customer needs. While the fact that the customer expect opposite one, it becomes the attractive values for them to use the services which also it might be more beneficial for the logistics and delivery service provider.

3. *Service Quality Dimension Analysis*. Referred to Table 5, this study focus on evaluating the logistics & delivery service based on 3-dimensional quality. From the resulted analysis, the 2 criteria from System Quality shows negative result. This means, an action of improvement on the system quality should be the logistics & delivery service provider priority for their business improvement.

Table 5. Criteria Categorization of Customer’s Perspective vs. Service Provider’s Perspective

Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Customer	A	A	A	A	P	I	A	A	A	I	P	P	A	A	A	A	A	A	A	A
Service Provider	P	P	P	P	P	P	A	I	P	P	M	M	M	I	A	A	P	P	A	P
Importance	8	8	8	8	8	8	8	7	8	8	8	8	7	7	8	7	8	8	7	8
Service Provider	9	9	9	7	9	9	7	7	9	9	9	7	7	5	7	7	7	9	7	9

5. Conclusion

This study was conducted to evaluate the gap existed in the perspective of customers (expectation) vs. the perspective of logistics and delivery service provider (perception) seeing how the service quality should implemented in the current trends of logistics and delivery service industry. This study uses quantitative approach by distributing online questionnaires to respondents who have been using the service of logistics service provider (LSP) to deliver their goods, the subject is those who ever use either the conventional LSP or Online-based Transportation LSP. Through literature study, we identified 3-dimensional logistics service quality with 20 criteria that can be used to measure the logistics and delivery service quality. The 20 criteria then used to evaluate by using the KANO evaluation model, to analyze the perspective gap then the KANO results implemented towards SERVQUAL Gap Analysis Model on Gap Number 1.

The analysis conducted from 3 different aspects. Mention the first aspects is Positive Gap Analysis, this analysis given a result where the conventional LSP has fully satisfied the needs of customers on 13 criteria of service quality. Where at the second aspects which is Negative Gap Analysis, the conventional LSP has weaker performance which lossing their customers satisfaction on 7 criteria of service quality they been provided. The last analysis aspect is the dimensional service quality analysis. From defined 3-dimensional service quality, the conventional LSP has low consideration on the dimension which contrary high on the side of costumers’ perspective. The conventional LSP perceive the System Quality as the dimension which not have to priorly be improved in order to satisfied the customer needs on logistics and delivery service quality.

From this study, its found that at the logistics and delivery service industry especially on the last-mile or final deliveries stream has shifted a lot at the perspective of what customers expects. The trends and technological advancement create the value on the logistics service quality where the millenials as the major customers were truly needs these days. This condition is beneficial for the online-based transportation as the new-disruptive player who provides the parcel & delivery service on the logistics & delivery industry. While contratry applies for the conventional LSP





where still looking the technological advancement as minor benefits for their business sustainability.

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