Re-Use Intention of the Logistics Service Quality Model in Multiple Vendor-Retailers Based-On Multidimension Criteria

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ABSTRACT

This study contributes to the problem of logistics service quality in fast-moving consumer goods (FMCGs) products. This study aims to design a disaggregate model of logistics service quality on multi-retailer satisfaction using multiple linear regression models. This study also fills the gap in previous studies on logistics satisfaction models but is still limited to one retailer with multiple criteria. Multiple linear regression is the method used to solve this problem with the relationship between the dependent variable and the independent variable. The independent variables consist of service reliability, delivery speed, product quality, price, and response to complaints, while the study object uses three vendors and 50 retailers. Vendors are companies that supply products, while retailers are grocery stores and mini markets that determine demand. The findings reveal that the variables that influence the two logistics satisfaction models are (1) aggregate (price, product quality and service reliability) and, (2). disaggregate, (service reliability, product quality and price). Meanwhile, validation of logistics service satisfaction by interviewing vendors in the field directly. This model will help provide insight for decision makers of fast-moving consumer goods companies about the variables that affect logistics service satisfaction. The direction for future work focuses on the re-use intention model by integrating the vendor managementend Inventory by developing several dimensions that cause satisfaction.
Key Words: Logistics, Linear Multiple Regressions, Retailer, Service Quality, Vendor.

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1. INTRODUCTION

Logistics and transportation processes in terms of delivering goods with the best products, at the right location, at the right price, and with the best quality are challenges in last-mile delivery [1]. Complex challenges in economic growth, especially in the trade sector, related to the volume of ups and downs in market share require significant problem solving. Retail sector trade is a place to compete to win consumers. Retail is part of the supply chain logistics that connects distributors and consumers. Supply chain is a new theory in logistics that now includes the delivery of goods from the company to the end customer. Likewise, the role of distributors on stock availability (logistics), this is because to maintain market stability and support the welfare of retailers. Both factors are important to ensure meeting and evaluating demand [2]. In trading activities, distributors are the first party to receive products from the producers. These distributors can be individuals or companies that buy goods in large quantities. Due to large-scale purchases, they get a lower price, so they can resell the product at a higher price to make a profit [3].

The number of retailers (grocery stores) in Indonesia will increase by 16% in 2023. Likewise, the retail sales index in 2024 was 214.1 and decreased significantly in 2020-2021 because of the COVID-19 pandemic [4].

In existing studies, researchers measure customer satisfaction. Customer satisfaction encourages consumers and re-use intention is significantly the goal of retailers. Research [5] discusses, a comprehensive model of the relationship between service quality dimensions (direct and indirect) on customer satisfaction and logistics service reuse intention. The results can improve the overall performance of logistics service providers (LSPs). The Researchers used a partial least squares structural equation applied to 810 respondents in China. The dimensions used consist of personal contact

quality (PQ), resource quality (RQ), operation quality (OQ), information quality (IQ), customer satisfaction (CS), customization quality (CQ), re-use intention (RI). CS is the emotional response of customers when there is a difference between expectations and desires for the services provided. CS will affect RI. RI is a way to measure customer loyalty for buying behavior, reuse of previously used products, and prevent customer loss. For this reason, increasing the retention ratio is essential for all companies.

To address this gap, this study aims to (RQ_1) design aggregate and disaggregate models of re-use intention, and (RQ_2) explore the relationship between five dimensions such as service reability [5], speed delivery [6], Product quality [7], price [3], and response to complaints [8], especially on the aspect of stock availability as part of logistics service quality is a major concern (gap). The significance of this study lies in how the model contributes to the logistics literature that has an impact on retailer satisfaction of reuse intentions and this study also suggests exploring more dimensions based on previous research results to make the model more comprehensive. Meanwhile, the policy implications of this study for logistics service providers are that it can help improve customer satisfaction, increase intention to reuse services, and build a loyal customer base, which ultimately leads to competitiveness in the market. Figure 1 shows the study object used to design a logistics satisfaction model for multi-channel (distributors-retailers) marked with orange boxes and green color shows the supply chain flow from upstream to downstream.

Figure 1. Model supply chain on last mile delivery

The rest of this study is organized as follows: Section 1 reviews the background and the many gaps in previous research, as well as the relevant literature. Section 2 discusses the state-of-the-art retailer logistics satisfaction model extended to the problem in detail. Section 3 analyzes the results thoroughly and finally, Section 4 concludes the further research contained in this section.

2. MATERIALS AND METHOD

2.1 Materials

To find gaps in this study, the researcher created a mapping based on a literature review of previous studies using VOSviewer version 1.6.20 on the topic of customer satisfaction and re-use intention. The gap is known as the state of the art (SOTA) which is illustrated in Table 1. Research [7] deals with the impact of product and service quality, and customer satisfaction on customer loyalty. To collect data using questionnaires and interviews with 100 respondents in a restaurant. The results show that the probability of 76.8% customer loyalty is based on product quality and customer satisfaction, service quality. In contrast to [9], which measures customer satisfaction and logistics efficiency using the SERVQUAL method. The model is used to measure the gap between the level of superior consumer service and the service in general. The main finding produced is to confirm that there is a relationship between logistics efficiency and logistics performance (perceived customer quality and, customer satisfaction level), as well as the relationship between customer satisfaction, profitability and customer loyalty.

Table 1. State-of-the-art pada model logistics service quality retailer

Key performance indicators	(Uvet, 2020) [10]	(Lim et al., 2021) [11]	(Burity, 2021a) [9]	(Naini et al., [7]	(Lin et al., [5]	(Cui et al., 2023) [6]	(Karmila & Barlia, 2023) [3]	(El Moussaoui et al., 2023) [12]	This study
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dimensions									
Service reability	-	-	■	■	■	-	-	-	■
Speed delivery	-	-	-	-	-	■	-	-	■
Product quality	-	-	-	-	-	-	-	-	■
Price	-	-	-	-	-	-	■	-	■
Response to complaints	-	-	-	-	-	-	-	-	■
2. Attributes	-	-	3	3	2	3	3	-	15
3. Method									
PCA	-	-	-	-	-	-	-	■	-
CPA	-	-	-	-	-	-	-	-	-
SEM	-	-	-	-	-	-	-	-	-
MRL	-	-	-	-	-	-	-	■	■
CSI	-	-	-	-	-	-	-	-	-
4. Coverage topics									
Logistic Service Quality	-	-	-	■	-	-	■	-	
Reuse intention	-	-	-	-	■	-	-	-	
5. Product type									
FMCG	-	-	-	-	-	-	-	-	■
Groceries	-	-	-	-	-	-	-	-	-
General	■	■	■	■	■	-	-	■	-

Abrevations:

PCA=Principle-Component Analysis; CPA; SEM; MLR=Multiple Linear Regression linear; CSI=Customer Service Index; FMCG=Fast Moving Consumer Goods

2.2 Method

In this study, the multiple linear regression method of [13] is used to solve the problem of logistics service satisfaction with the stages of survey instruments and, data collections with a target respondent of 50 sample retailers. Respondents are retailers in one of the districts in Indonesia. Data collection was done using a Google form platform with a Likert scale of 1-3. The retailer category comprises of grocery stores and minimarkets. While minimarkets dominate over grocery stores by as much as 66%. Based on the results of the survey that has been conducted, it is found that (1) delays in delivery from two-day time windows as much as 28%, (2) stock shortages of 24%, (3)

mismatches of goods ordered and the frequency of stock outs at distributor warehouses are, indicators of weak inventory management and logistics coordination. Therefore, the aspect of stock availability as part of the quality of logistics services is a major concern (gap). This is because it can have a significant impact on the level of satisfaction and re-use intention as well as the sustainability of business relationships between distributors and retailers.

The multiple linear regression model equation is illustrated below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \varepsilon \tag{1}$$

Where:

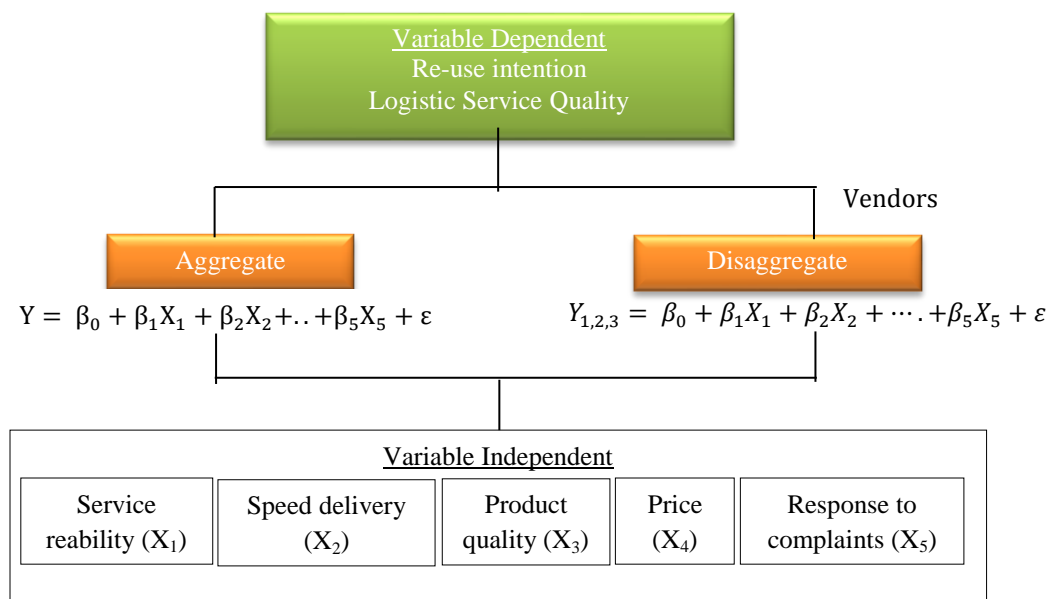|	
Y	= Independent variable
β_0	= Intercept
$\beta_n X_{n,}$	= Slope (Beta standard coefficient)
ε	= Error

Figure 2. Model of re-use intention logistic service quality based on multidimensions

Based on Figure and Table 2, Y is the dependent variable, re-use intention logistic service quality with dimensions Service reliability (X1), speed delivery (X2), Product quality (X3), price (X4), and response to complaints (X5) as independent variables. Meanwhile, the dimensions used refer to previous studies including ([5]; [6], [7], [3] and [8]. The first dimension with the stock availability attribute is the initial finding of this study obtained during initial interviews with retailers.

Table 2. Operational definitions of dimensions and attributes of logistics retailers' service satisfaction model

Dimensions		Attributes	Definition operational	References
Service reability (X_1)	K_{L1}	Quality of the Information	Distributor sales and delivery roles based on information quality attributes, Stock availability and order accuracy.	(Lin et al., 2023) [5]
	K_{L2}	Stock Availability		
	K_{L3}	Order Accuracy		
Speed delivery (X_2)	K_{CP1}	Delivery Timeliness	Duedate sales during the delivery process with attention to product information and safety	(Cui et al., 2023) [6]
	K_{CP2}	Product Safety		

	K_{CP3}	Clear Shipping Information		
Product quality (X_3)	K_{P1}	Products not expired	Relates to worth products that are worth selling and get a quick response from consumers.	(Naini et al., 2022) [7]
	K_{P2}	Products are known to the public		
	K_{P3}	Products on the Market		
Price (X_4)	H_1	Prices according to the market	Refers to price suitability such as providing discounts and product price suitability	(Karmila & Barlia, 2023) [3]
	H_2	Provision of discounts		
	H_3	Price Transparency		
Response to complaints (X_5)	R_{TK1}	Feedback System	Openness to receiving suggestions and criticism from customers and quick response.	(Burity, 2021a) [9]
	R_{TK2}	Follow-Up		
	R_{TK3}	Speed of the follow-Up		

3. RESULT AND DISCUSSION

Respondent data validation using the data sufficiency test with 95% confidence level and 5% accuracy. There are 3 vendors (V_1, V_2 dan V_3) with 50 retailers (R_1, R_2, … R_{50}). The data sufficiency test on 50 retailer respondents against 3 vendors is sufficient with values of 33, 44 and 36, respectively. In addition, the validity test was used to measure the correlation between the questions, dimensions, and attributes. The results of the test show that all are valid because the calculated R value exceeds 0.297. Likewise, the reliability of the instrument was tested using the reliability test with a value exceeding 0.60.

In addition, to test the dependent variable (Yv) using the coefficient of determination (R-squared or R^2). R-squared is the square of the multiple correlation coefficient (R^2) to measure the proportion of variability in the dependent variable (Yv) that can be explained by the linear regression model by all the overall factors. In hypothesis testing, R^2 is used to evaluate the goodness of fit of the regression model as a whole. If the R^2 value is high, it indicates that the model fits the data well and has good overall predictive ability. R^2 is also related to the F test in the analysis of variance (ANOVA) for regression. The F test tests the null hypothesis that all regression coefficients (other than the constant) are zero. The coefficient of determination is the proportion of total variation in y explained by all x variables together.

Table 3. Correlation coefficient and determination

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
Y_{V_1}	.837[a]	.701	.667	.78521
Y_{V_2}	.726[a]	.528	.474	.83769
Y_{V_3}	.915[a]	.837	.818	.61085

ı. Predictors: (Intercept), X_5, X_4, X_3, X_2, X_1

Based on Table 3, the R value of each vendor is 0.837; 0.726 and 0.915, exceeding the significance level of 0.05. Therefore, there is a strong correlation for all dimensions, namely X_1; X_2; X_3; X_4; X_5. Conversely, the calculation of the coefficient of multiple determination R Square has a value of 0 or 70.1%. This value indicates that 70.1% of the variation in retailer satisfaction is explained by variations in the five dimensions and a strong correlation in retailer satisfaction, while the remaining value of 29.9% is not explained in this study. Referring to Table 4, there is a strong influence between the dependent variable (Y_V; Y_{V_1}; Y_{V_2}; Y_{V_3}) and independent (X_1; X_2; X_3; X_4; X_5) based on the significance level of 0.000 < 0.05. While the comparison between F_{Count} and F_{Table} is more than 2579 for the three vendors. The third vendor is a vendor that has a very close relationship with other vendors.

Table 4. F-test results for three vendors

Model		Sum of Squares	df	Mean Square	F	Sig.
Y_{V_1}	Regression	63.591	5	12.718	20.628	.000[b]
	Residual	27.129	44	.617		
	Total	90.720	49			
Y_{V_2}	Regression	34.508	5	6.902	9.835	.000[b]
	Residual	30.876	44	.702		
	Total	65.384	49			
Y_{V_3}	Regression	84.288	5	16.858	45.178	.000[b]
	Residual	16.418	44	.373		
	Total	100.706	49			

Dependent Variable: Y

Predictors: (Constant): (X_1; X_2; X_3; X_4; X_5)

To answer RQ_1 on the re-use intention-logistics service quality model is divided into two models, namely:

1st: Model Disaggregation

Equation 2-4 shows the estimation model of the relationship between re-use intention logistics logistics service quality at three vendors ($Y_{V_1}, Y_{V_2}, Y_{V_3}$) on retailer satisfaction based on the five dimensions (X_1, X_2, X_3, X_4, X_5). The estimated value of the intercept (10.396) indicates the estimated mean value of y if all Xi are not equal to 0 in the range of observed values. Retailer satisfaction with the vendor (V1) will increase on average by 0.311 units for every increase in service reliability (X_1) and 1.317 units for an increase in response to complaints (X_5). Vice versa, retailer satisfaction will decrease by 0.253; 0.337; 0.838 against speed delivery (X_2); product quality (X_3); and response to complaints (X_5).

$$Y_{V_1} = 10.396 + 0.311X_1 - 0.253X_2 - 0.337X_3 - 0.838X_4 + 1.317X_5 + \varepsilon \qquad (2)$$

In the second vendor, there is a decrease in the intercept value of 3.619 (35%) from V_1, which affects the retailer satisfaction prediction model. Retailer satisfaction only occurs in service reability (X_1); product quality (X_3); price (X_4) and will experience an average increase of 0.363; 0.447, and 0.254 units.

$$Y_{V_2} = 6.777 + 0.363X_1 - 0.267X_2 + 0.447X_3 + 0.245X_4 - 0.423X_5 + \varepsilon \qquad (3)$$

The last model also decreased the intercept value by 6.742 (65%) from V_1. Variables that support the level of retailer satisfaction are service reliability (X1); speed of delivery (X_2); price (X_4); response to complaints (X_5) with an average increase of 0.410 units. There was a decrease of 0.438 units in Product quality (X_3).

$$Y_{V_3} = 3.654 + 0.456X_1 + 0.470X_2 - 0.438X_3 + 0.513X_4 + 0.204X_5 + \varepsilon \qquad (4)$$

2nd: Model Aggregate

This model shows the satisfaction level of 150 retailers with 3 vendors with the same parameters used in the disaggregate model. The estimated retailer logistics service level has an intercept value of 16.219, which will increase the value of the satisfaction level. The satisfaction model will increase on average by 0.178; 0.306 and 0.794 units for each increase in service reliability (X_1); product quality (X_3); price (X_4). Likewise, speed delivery (X_2) and response to complaints (X_5) will reduce retailer satisfaction.

$$Y_V = 16.219 + 0.178X_1 - 0.168X_2 + 0.306X_3 + 0.794X_4 - 0.333X_5 + \varepsilon \qquad (5)$$

4. CONCLUSION

Finally, to align with RQ_1 related to the design of the logistics service satisfaction model. Of the three vendor models (disaggregated), the first vendor ((Y_{V_1}) can able to provide an estimated level of logistics service satisfaction to retailers. This is because it has the highest intercept value. The aggregate model provides a better solution than the aggregate model. This is because the intercept has increased by 56% even though the value of the dimensions Speed delivery (X_2) and response to complaints (X5) will contribute to reducing retailer satisfaction. When retailers give the highest rating related to satisfaction), the model still provides the highest satisfaction value from the aggregated model. In contrast, the dimensions used to answer RQ_2 are Price (X_4); Product quality (X_3); an average of 0.178; 0.306; 0.794 units for each increase in service reliability (X_1).

This research imitation refers to [7] and [5]. First, Naini proposed that product quality, customer satisfaction, and service quality affect consumer loyalty by 76.8% in a restaurant. Thus, consumers feel happy the third time returning to the restaurant. Factors such as response accuracy, product uniqueness, and employees' attention encouraged 100 respondents to come twice. On the other hand, Lin also proposed a logistics service quality framework that integrates six variables, namely customer satisfaction and customer satisfaction.

On the other hand, Lin also proposed a logistics service quality framework that integrates six variables, namely customer satisfaction, which is influenced by operational-customization-resource-information-personal contact quality to improve logistics service re-use intentions. With practical implications, this model will help provide insight for decision makers of fast-moving consumer goods companies about the variables that affect logistics service satisfaction. The direction for future research focuses on the re-use intention model by integrating the vendor management inventory by developing several dimensions that cause satisfaction.

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