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Increasing online consumer satisfaction with logistics service quality: A study in Riau Islands province, Indonesia

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ABSTRACT

This study's primary goal was to assess the influence of logistics service quality (LSQ) on online consumer satisfaction (CS) in the Province of Riau Islands, Indonesia. The investigation addresses the various dimensions of LSQ, consisting of the personnel contact quality (PCQ), timeliness delivery quality (TDQ), order discrepancy handling quality (ODHQ), information quality (IQ), and order condition quality (OCQ). Research questionnaires were sent to 500 consumers in the Province of Riau Island, and 344 responses were valid. The investigations employed multiple regression, reliability, and validity tests. All variables–LSQ dimension and CS showed satisfactory reliability and validity. The finding showed that the LSQ dimensions, consisting of PCQ, TDQ, ODHQ, IS, and OCQ, have a significant impact on CS. This study underscores the criticality for logistics companies to enhance their LSQ, as it significantly influences CS and boosts their competitiveness. This research's approach to exploring logistics services in the e-commerce industry is expected to make significant contributions to logistics service and CS in a more comprehensive study.

Contribution/Originality: This study was designed to examine the effect of LSQ dimensions on online CS in Riau Islands Province, Indonesia. This research contributes to the logistics service company in improving LSQ to enhance CS and increasing company competitiveness. Moreover, this study adds to the literature on logistics by offering a thorough model that incorporates LSQ characteristics and their effect on online CS in the province of Riau Islands.

1. INTRODUCTION

Literature surveys indicated that researchers have used a number of methods to measure LSQ although there is debate about the components of LSQ, how LSQ, affects CS, and how each LSQ component plays a role in the logistics chain system in relation to consumer satisfaction (Brady, Cronin Jr, & Brand, 2002; Huang, Yan, & Qiu, 2009). The direct correlation between LSQ and CS indicates that service quality is the primary factor influencing CS. Most previous studies have examined the relationship between LSQ and CS using the satisfaction model developed by Cronin Jr, Brady, and Hult (2000). Further research has shown that satisfaction is directly influenced by service quality. This is especially true in the field of business-to-consumer (B2C) service marketing (Brady et al., 2002; Cronin Jr et al., 2000). Most previous studies have assessed an integrative model of logistics service performance evaluation, which has an impact on customer service (CS) in B2B supply chains. Since this study focuses on end users, the authors propose and evaluate the LSQ and CS frameworks in a B2C scenario.

Logistics is an essential component that can assist in building a successful online business. By facilitating the efficient movement of goods from suppliers to manufacturers, sellers, or distributors, and eventually to consumers, logistics services play a critical role in the supply chain. According to studies by Bowersox, Mentzer, and Speh (2008) offering top-notch logistics services has a big impact on boosting client loyalty and satisfaction. However, there is relatively little research available on the Riau Islands. Thus, further study in this field is required. This study aims to examine whether LSQ dimensions affect online CS in Riau Islands Province, Indonesia. This study found that LSQ dimensions, including PCQ, TDQ, ODHQ, IS, and OCQ have a positive and significant impact on CS.

This study contributes to the development of literature on logistics management and its relationship with CS improvement. To meet overall consumer expectations in using logistics services, logistics companies should focus on business aspects that can offer flexible, timely, and accurate delivery options, efficient problem-solving quality, clear and comprehensive information, and polite and friendly communication. In addition, logistics companies can offer reliable and up-to-date information, and improve communication channels. Logistics companies can increase their consumer base and improve their competitiveness in the internet market. This study is structured as follows: (a) The introduction briefly discusses previous research related to LSQ and its impact on CS. Most of the previous studies focus on the B2B perspective. However, this research is different because this research focuses on end consumers or B2C perspective. (b) The next section includes literature review and hypothesis formulation. (c) research methodology, (d) discussing the results, (e) conclusions, and (g) recommendations.

2. LITERATURE REVIEW AND HYPOTESES BUILDING

2.1. Logistics Service

Service quality has become a major topic in logistics research due to the increasing attention to satisfaction since the mid-1980s (Richey, Daugherty, & Roath, 2007). Millen, Sohal, and Moss (1999) revealed that LSQ significantly improves CS. In addition, Argüelles, Casielles, Martín, and del Río Lanza (2002) asserted that logistics service quality has the greatest influence on CS. The advent of e-commerce has changed the way we shop. However, a network of logistics services is essential to ensure timely and reliable delivery. Logistics, acting as a support system and critical element, can drive the success of online businesses. With its ability to facilitate the movement of goods from suppliers to manufacturers and ultimately buyers, logistics services play a vital role in the supply chain. The supply chain will be disrupted and transactions will end if logistics are poor. Common problem in online company logistics include issues with personnel contact quality, on-time delivery quality, management quality, order discrepancies, information quality and order condition quality (Mentzer, Flint, & Hult, 2001).

Some studies have proven the importance of LSQ in achieving client happiness. Many previous researchers, including Rafiq and Jaafar (2007) have studied the impact of LSQ on customer satisfaction. However, most studies have confirmed that, in business-to-business (B2B) settings, LSQ and CS are positively correlated (Bienstock, Mentzer, & Bird, 1997; Mentzer et al., 2001). The relationship between LSQ dimensions—including PCQ, TDQ, ODHQ, IS, OCQ and satisfaction in the business-to-consumer (B2C) context is the main focus of current research.

However, previous researchers have defined LSQ in limited dimensions. Zeithaml, Berry, and Parasuraman (1996) showed the importance of factors influencing LSQ that impact customer satisfaction. In the US logistics sector, Mentzer, Flint, and Kent (1999) extended the SERVQUAL framework to identify important dimensions in evaluating LSQ, such as information quality, order quantity, accuracy, timeliness, procedures, order conditions, order discrepancy handling, quality personnel contact, and order quality. Sorkun, Yumurtacı Hüseyinoğlu, and Börühan (2020) investigated LSQ and customer satisfaction based on one dimension of operational service quality. Similarly, using LSQ dimensions such as operational information sharing, order discrepancy handling, personal contact quality, and order conditions, Uvet (2020) investigated the relationship between LSQ and customer satisfaction. The study conducted by Gupta, Singh, Mathiyazhagan, Suri, and Dwivedi (2023); Revindran, Ragen, and Mahmud (2020) and

Choi, Chung, and Young (2019) examined multiple aspects of LSQ in relation to consumer satisfaction and loyalties. The LSQ dimensions have been the subject of previous research, as Table 1 illustrates.

However, the LSQ dimensions previously utilized by researchers remain limited to business-to-business clients. The author of this study looks at the impact of LSQ on B2C CS in the province of the Riau Islands. This study investigates the relationship between LSQ dimensions and online CS. This study begins with the Indonesian market and looks at the relationship between LSQ and CS in the KEPRI province, which has significant theoretical and practical implications given the cultural and environmental variances in different nations and areas. This study is important because it adds to the literature on logistics by offering a thorough model that incorporates LSQ characteristics and their effect on online consumer satisfaction in the province of Riau Islands.

Figure 1 shows the research model that the researchers proposed for the current investigation. This model was created using the Parasuraman, Zeithaml, and Berry (1985) and Mentzer et al. (2001) models, as well as the service quality literature (SERVQUAL). CS is the fundamental concept in evaluating the quality of logistics services, as the study concentrates on online and repeat consumers. For this reason, it is critical for logistics companies to acquire a competitive edge and establish enduring relationships with clients (Innis & La Londe, 1994). Thus, the study's hypothesis is that the factors that are determined to have the biggest effects on consumer satisfaction are human contact quality, timeliness quality, handling of order discrepancies quality, information quality, and order condition quality. This study considers these parameters as LSQ determinants.

2.2. Hypotheses Construction

2.2.1. The Personnel Contact Quality and CS

Contact staff in logistics services aim to understand the needs and expectations of clients, enabling logistics service providers to meet consumer demands (Bitner, Booms, & Mohr, 1994). Therefore, important skills for logistics service professionals include experience, empathy for consumer circumstances, customer contact or personnel contact readiness to help consumers during the delivery process, and building strong relationships with consumers. These skills influence consumer perceptions of the quality of service they receive. Improving the quality of employee interaction in logistics service will increase online CS in the Riau Islands Province.

Communication between clients and contact consumers is crucial during the logistics service delivery process to enhance consumers' perceptions of services (Parasuraman et al., 1985). Clients assess logistics service quality based on three factors: corporate quality, interactive quality, and physical quality. The main component of service quality is the interactive element, which is defined as the interaction between clients, contact staff, and other clients. Therefore, logistics companies need to pay attention to these three factors in order to improve CS. According to Bitner et al. (1994) frontline employees who work as part of the contact staff have a proper understanding of their clients, which helps them adjust consumer expectations and demands. CS with service quality is influenced by the core characteristics of the service provider, including experience, empathy for consumer needs, readiness to solve problems during the service delivery process, and consumer interaction, the assistance they receive (Bitner et al., 1994; Mentzer et al., 2001).

Table 1. LSQ dimension summary.

Logistics service quality (LSQ) dimension	Bienstock, Royne, Sherrell, and Stafford (2008)	Birdogan, Basfirnci, Ar, and Cilingir (2009)	Gotzamani, Longinidis, and Vouzas (2010)	Miloradić. Kilibarda and Andrejić (2012)	Thai (2013)	Bouzaabia (2013)	Politis, Giovanis, and Binioris (2014)	Roslan, Wahab, and Abdullah (2015)	Vural and Tuna (2016)	Limburg, Giang, and Cools (2016)	Milorad Kilibarda, Nikolicic, and Andrejic (2016)	Yu, Wang, Zhong, and Huang (2016)	Sohn, Woo, and Kim (2017)	Murfield, Boone, Rutner, and Thomas (2017)	Zailani, Jafarzadeh, Iranmanesh, Nikbin, and Selim (2018)	Yumurtacı Hüseyinoğlu, Sorkun, and Börühan (2018)	Knop (2019)	Lee, Chan, Chong, and Thadani (2019)	Chen, Pan, Chen, and Liu (2020)	Iqbal (2020)	Shaban and Salih (2020)	Lin, Mamun, Yang, and Masukujjaman (2023)
Timeliness	√	-	√	√	√	√	√	-	-	-	-	√	-	√	√	√	-	-	-	-	√	
On-time delivery	√	-	√	√	√	√	√	-	-	-	-	√	-	√	√	√	-	-	-	-	-	
Order processing time	√	-	√	√	√	√	√	-	-	-	-	√	-	√	√	√	-	-	-	-	-	
Operational quality	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√
lead-time	√	-	√	√	√	√	√	-	-	-	-	√	-	√	√	√	-	-	-	-	-	
Order release quantity	√	-	√	√	√	√	√	-	-	-	-	√	-	-	√	√	-	-	-	-	√	
Order accuracy	√	-	√	√	√	√	√	-	-	-	-	√	-	-	√	√	-	-	-	-	√	
Order discrepancy handling	√	-	√	√	√	√	√	-	-	-	-	√	-	-	√	√	-	-	-	-	√	
Oder procedure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Order quality and correctness	√	-	√	√	√	√	√	-	-	-	-	√	-	-	√	√	-	-	-	-	-	
Personal contact quality	-	√	-	-	√	√	√	√	√	√	√	-	√	-	√	√	√	√	√	√	√	
Responsiveness	-	√	-	-	√	√	√	√	√	√	√	-	√	-	√	√	√	√	√	√	-	
Customer focus	-	√	-	-	√	√	√	√	√	√	√	-	√	-	√	√	√	√	√	√	-	
Information quality	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	√

Given the importance of staff-consumer contact in the perception of logistics service quality, the following hypothesis regarding the effect of human contact quality on CS is proposed.

H_1: The quality of personnel contact in logistics service significantly influences the online CS in Riau Islands Province.

2.2.2. The Quality Timeliness and CS

Timeliness of delivery is very important in logistics services, because it plays an important role in increasing CS. Therefore, logistics companies must improve the accuracy and speed of delivery. The length of time required between the time of ordering by the consumer and the delivery of the product to the consumer is called delivery time. For consumers who use logistics services, the estimated time of arrival of the ordered goods is usually a benchmark for assessing the quality of delivery services. The faster and more accurate the goods are sent to the consumer, the better the consumer's perception of logistics services. Cycle time is a competitive measuring tool that covers the period from ordering to receiving the goods by the consumer. The most important metric that shows the effectiveness of the delivery system is cycle time, which includes the time spent on transportation and reordering for non-conforming products (Mentzer et al., 2001; Mentzer et al., 1999). The most important aspect of logistics service quality is time utility, which affects the perception of logistics service quality. Likewise, the creation of place utility greatly affects consumer perceptions of logistics service quality. Online consumers are more satisfied with logistics service providers if deliveries are made according to the promised schedule.

Thus, the hypothesis proposed is The Quality Timeliness delivery in logistics service positively affects CS in Riau Islands Province.

H_2: The Quality Timeliness delivery in logistics service positively affects CS in Riau Islands Province.

2.2.3. Order Discrepancy Handling Quality and Online CS

Logistics companies handle ordering discrepancies by addressing variations in orders once they receive them (Mentzer et al., 2001). Consumer opinions of LSQ are greatly impacted by the ability of logistics service providers to resolve errors, like incorrect items and subpar quality (Mentzer, Myers, & Cheung, 2004; Uvet, 2020). The ability of logistics providers to resolve discrepancies, including misdelivery and poor quality, has a significant impact on consumers' purchase opinions of LSQ. Novack (1995) defined corrective action as "how well the 3PL service provider resolves any discrepancies in the logistics service." Improving order discrepancy management for logistics service providers has the potential to improve CS.

H_3: Order Discrepancy Handling Quality in logistics service significantly influences the online CS in Riau Islands Province.

2.2.4. Information Quality in Logistics Service and Online CS

Logistics services in Riau Islands Province can now be considered to be of higher quality because logistics companies use logistics information systems. Information shared between internal and external stakeholders forms a logistics information system. The timeliness and accuracy of orders placed in logistics services can be improved, but external information exchange—including providing real-time access to information to clients—can also reduce service quality. The end product and the delivery methods of logistics companies greatly influence expectations (Parasuraman et al., 1985).

The following hypothesis regarding the impact of information quality on CS is proposed: The information quality in logistics service significantly influences the online CS in Riau Islands Province.

H_4: The information quality in logistics service significantly influences the online CS in Riau Islands Province.

2.2.5. Order Condition Quality in Logistic Service and Online CS

Whether or not the order arrives in good shape depends on its condition (Mentzer et al., 2001; Uvet, 2020). For consumers, the state of the products they receive and the promptness of delivery are crucial considerations. Inadequate

safeguarding could cause product damage while in transportation. Consumers desire flawless delivery of the items they order. Consumers may select a different vendor for upcoming transactions if that isn't the case. As a result, it's critical to determine the factors that may affect order conditions (Zlatkovic, 2013).

One of the most crucial components of the quality of physical logistics services is order condition, which gauges the extent of damage an order sustains during delivery (Bienstock et al., 1997; Mentzer et al., 2001). Because the research has focused on the effect of order circumstances on satisfaction perceptions, we anticipate a direct association between order conditions and CS in this study.

H_5: Order Condition quality in logistics service significantly influences the online CS in Riau Islands Province.

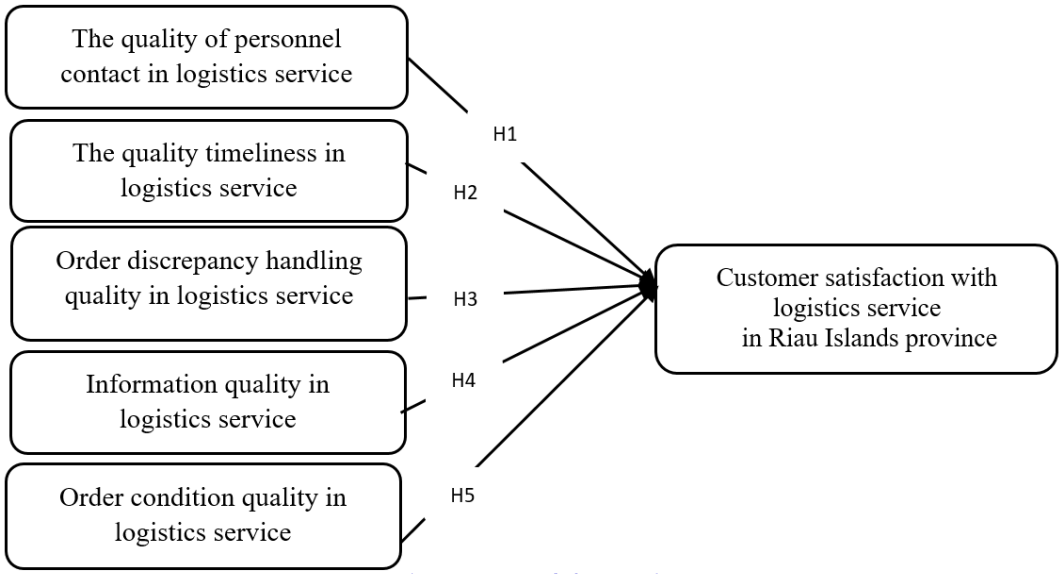

Figure 1. Research framework.

3. RESEARCH METHODOLOGY

3.1. Population and Sample

According to Hair (1998) the sample size of the study should be at least five times larger than the total number of variables in the factor analysis. Tabachnick and Fidell (1989) stated that a sample size of 300 is considered good, 500 is considered very good, and 1000 is considered excellent. The study sample consisted of 500 individuals.

We conducted a survey of clients who have utilized logistics services in the Riau Islands Province. After compiling a comprehensive scale and questionnaire, focusing on the online CS aspect and the LSQ dimension. Online data collection was carried out using Google Forms by distributing the Google Form link in WhatsApp groups and Facebook groups. After collecting the data sample, the researcher retested the scale and research model to confirm the adequacy of the sample size. In this study, SPSS, Amos, was used to process the data obtained. In the Riau Islands Province, the relationship between the LSQ and CS dimensions was studied through the use of the Cronbach Alpha reliability coefficient, confirmatory component analysis, exploratory factor analysis, and structural equation model analysis.

3.2. Questionnaire Design

Likert scale from Strongly Disagree to Strongly Agree is employed for the LSQ dimension. The scales taken from Mentzer et al. (2001) were used to measure the LSQ dimension. Mentzer et al. (2001) created the scales to measure the satisfaction. Table 2 displays every specific measurement item.

Table 2. Construct and measurement items of LSQ dimension, consumer satisfaction.

Construct	Items	Measure	Supporting reference
Personnel contact quality	PCQ-01	Employee conduct and attitude toward satisfying consumers.	Bienstock et al. (2008)
	PCQ-02	Ability to adapt to the demands and specifications of consumers.	
	PCQ-03	Awareness and understanding of consumer demands and requirements.	
	PCQ-04	Employee ability to serve consumers.	
	PCQ-05	The experience and knowledge of the contact staff regarding the service is adequate.	
Timeliness quality	TLQ-01	There is not much time between submitting a request and getting the item delivered.	Mentzer et al. (2001)
	TLQ-02	Delivery time was met at the scheduled time.	
	TLQ-03	There is little time spent with a request being back ordered.	
Order discrepancy handling quality	ODHQ-01	The quality inconsistencies provided have been satisfactorily corrected.	Mentzer et al. (2001)
	ODHQ-02	The procedure for reporting discrepancies is sufficient.	
	ODHQ-03	Order inconsistencies are satisfactorily addressed.	
Information quality	IQ-01	The accuracy of the order data.	Mentzer et al. (2001)
	IQ-02	Information technology application for consumer service.	
	IQ-03	The capacity to track shipments.	
	IQ-04	Order information is accessible.	
	IQ-05	The data is up to date, precise, and easily comprehensible.	
	IQ-06	Shipping-related real-time information is always available.	
	IQ-07	Services are sufficiently able to communicate with consumers externally by sharing both standardized and customized information.	
	IQ-08	Effective consumer exchange of operational information is achieved.	
Order condition quality	OCQ-01	Order from logistics services received in perfect condition.	Mentzer et al. (2001)
	OCQ-02	The transit mode is rarely the cause of order damage.	
	OCQ-03	Rarely does order damage emerge from handling by the transit carrier.	
	OCQ-04	Order arrived undamaged.	
	OCQ-05	Order is shipped with good protection.	
Online consumer satisfaction	OCSAT-01	The way that my logistics service provider has performed has me thrilled.	Mentzer et al. (2001)
	OSAT-02	My expectations were met by the logistics service offering	
	OSAT-03	You are getting good services from the logistics service provider	
	OSAT-04	I have only good things to say about the logistics service provider.	

4. RESULT

Data was collected using offline and online surveys. Data collection obtained 344 valid responses.

Table 3 displayed the response rate of 69%. Consumers received a total of 500 sets of questionnaires. Out of 500 questionnaires distributed, only 390 responses. However, only 344 responses were completed because 46 responses were incomplete and could not be processed in the next stages.

Table 3. The of distribution questionnaire (n-344).

Questionnaire distribution	Response	Incomplete questionnaire	Complete questionnaire	Response rate
500	390	46	344	69%

4.1. Statistic Descriptive

Table 4 concludes the demographic section covering gender, age, frequency of use of logistics services in the last 3 month, monthly income, place of domicile, and occupation.

Table 4. Demographic profile (n=344).

Category	Frequency	%
Gender:		
Female	213	62%
Male	132	38%
Total	344	100%
Age:		
< 20 years	0	0%
20-30 year	90	26.02%
31-40 year	144	41.87%
41-50 year	94	27.24%
> 50 year	17	4.88%
Total	344	100.00%
Frequency of use of logistics services in the last 3 months:		
1-3 times	251	72.76%
4-6 times	71	20.73%
7-10 times	13	3.66%
>10 times	10	2.85%
Total	344	100.00%
Monthly income (Rp):		
<= 5,000,000	143	41.46%
6,000,000 to 7,000,000	45	13.01%
8,000,000 to 9,000,000	84	24.39%
>= 10,000,000	73	21.14%
Total	344	100.00%
Place of domicile:		
Bintan regency	21	6.10%
Karimun regency	34	9.76%
Anambas Islands regency	48	13.82%
Lingga regency	24	6.91%
Natuna regency	39	11.38%
Batam city	150	43.50%
Tanjung Pinang city	29	8.54%
Total	344	100.00%
Occupation:		
Private employee	111	32.11%
Civil servant	20	5.69%
Self-employed	73	21.14%
College student	116	33.74%
Housewife	25	7.32%
Total	344	100.00%

4.2. Reliability and Validity Result

The concepts of validity and reliability are two distinct characteristics of a measuring device. A measurement tool can be valid and reliable, but being valid usually means being reliable. But validity cannot be guaranteed by reliability alone. Even if deemed reliable, a test may not accurately reflect the anticipated behavior or quality. Therefore, before using a measurement tool, researchers must ensure that it is valid and reliable (Sürücü & Maslakci, 2020).

Validity indicates whether the data collected has covered the actual area of investigation (Ghauri & Grønhaug, 2005). Validity means assessing what you want to assess (Field, 2005). According to Drost (2011) reliability looks at whether the assessment can be repeated when someone else performs the assessment at a different time, under different conditions, perhaps with an alternative instrument that assesses the construct or skill. In reliability analysis, Cronbach's Alpha is used to determine whether it is reliable or not (Sürücü & Maslakci, 2020). (see Table 5).

Table 5. The value of Cronbach's alpha.

Reliability	Cronbach's alpha values			
	0.5 or <	0.6	0.7	0.8-0.9
	Unsatisfactory	Poor	Good	Excellent

In addition, the higher the α value, the more reliable the internal consistency (Ghauri & Grønhaug, 2005). Table 6 shows the α values obtained SPSS from 0.886 to 0.959. α for all logistics service quality variables, including PCQ, TDQ, ODHQ, IS, and OCQ > 0.70, indicating high internal consistency.

Table 6. The results of reliability analysis (n=344).

Construct	α	Items total	Reliable
PCQ	0.886	5	Yes
TDQ	0.804	3	Yes
ODHQ	0.859	3	Yes
IQ	0.819	8	Yes
OCQ	0.804	5	Yes
CS	0.850	4	Yes

To assess the data and questionnaire items of factor analysis and samples for each variable and the overall model, Bartlett and Kaiser-Meyer-Olkin (KMO) Sphericity Tests were used. The KMO value must be 0.6 or higher for the results to be accepted. KMO assesses the strength of the correlation and factorability of the variables.

The KMO sample adequacy measure for CS in logistics services in the Riau Islands Province is 0.898, meaning that the sample size is sufficient for analysis. In addition, the Bartlett's Sphericity test shows a chi-square value of 647.770 and 6 df, and a Sig. of 0.000, which means that the variables examined are significantly related to each other. The KMO measure of sample adequacy for the LSQ was significantly higher, at 0.898, indicating a very high sample size. The finding showed Bartlett's test of sphericity produces a chi-square value of 4030.686 with 68 df, and Sig. at 0.000, confirming a significant relationship between LSQ and CS in Riau Islands Province (see Tables 7 and 8).

Table 7. KMO and Bartlett's test (Customer satisfaction in Riau Islands province).

KMO and Bartlett's test		
Kaiser-Meyer-Olkin measure of sampling adequacy.		**0.898**
Bartlett's test of sphericity	Approx. chi-square	647.770
	Df	8
	Sig.	0.000

Table 8. KMO and Bartlett's test (Logistics service quality).

KMO and Bartlett's test		
Kaiser-Meyer-Olkin measure of sampling adequacy.		0.936
Bartlett's test of sphericity	Approx. chi-square	3.040.586
	Df	68
	Sig.	0.000

Tables 9a and 9b indicated that the factor loading value starts from 0.632 for CS in Riau Islands Province and 0.864 for LSQ. Table 9a, similarity and factor loading, meet the criteria because all items are > 0.6, which exceeds the minimum requirements. Table 9b, similarity and factor loading for all components of LSQ dimension, including PCQ, TLQ, ODHQ, IQ, OC, and CS in Riau Islands Province, are > 0.6. Thus, this indicates LSQ and CS in Riau Islands Province are sufficient to continue with additional analysis because all outcomes match the minimum requirement.

Table 9a. Factor loading for the preliminary test (Online customer satisfaction in logistic service in Riau Islands province).

Questionnaire items	Initial	Extraction
OCSAT-01	1.000	0.864
OCSAT-02	1.000	0.805
OCSAT-03	1.000	0.755
OCSAT-04	1.000	0.632

Table 9b. Factor loading for LSQ (Independent variable).

Items	Initial	Extraction
PCQ-01	1.000	0.831
PCQ-02	1.000	0.842
PCQ-03	1.000	0.828
PCQ-04	1.000	0.778
PCQ-05	1.000	0.792
TLQ-01	1.000	0.796
TLQ-02	1.000	0.863
TLQ-03	1.000	0.854
ODHQ-01	1.000	0.872
ODHQ-02	1.000	0.765
ODHQ-03	1.000	0.828
IQ-01	1.000	0.862
IQ-02	1.000	0.838
IQ-03	1.000	0.872
IQ-04	1.000	0.852
IQ-05	1.000	0.838
IQ-06	1.000	0.798
IQ-07	1.000	0.792
IQ-08	1.000	0.786
OC-01	1.000	0.843
OC-02	1.000	0.834
OC-03	1.000	0.776
OC-04	1.000	0.873
OC-05	1.000	0.864

4.3. Multiple Regression

Because adjusted R^2 is easily modified based on the number of independent variables—in this study, the independent variable is the LSQ—it is a more reliable measure of model fit because it protects against over-parameterization of the model. The model fit in a regression model is measured by the adjusted R^2 and R^2. While multiple linear regression places more emphasis on the adjusted R^2, basic linear regression often concentrates on R^2. When both the adjusted R^2 and R^2 surpass 0.5, which indicates that the model accounts for 50% of the variation, the model is said to be in fit. R-squared measures the total variation in the LSQ that influences the CS. As Table 10

illustrates, CS accounts for 62.5% of the variance. In the Table, b indicates the predictor, meaning that customer satisfaction was influenced by the predictor (PCQ, TLDQ, ODHQ, IQ, OCQ).

Table 10. Summary of multiple regression.

Model summary				
Model	R	R^2	Adjusted R^2	Std. error of the estimate
1	0.828a	0.631	0.625	3.943

Note: a. DV: Customer satisfaction.
Predictors: (Constant) PCQ, TLDQ, ODHQ, IQ, OCQ.

4.4. ß Coefficient

Table 11 displayed the LSQ β, t, and significance values. The p-value must < 0.05 and the t-test statistic must be > one in order to assess the significance of the beta coefficient. As indicated by Table 11, the results demonstrated that the LSQ dimension, which included ODHQ (β =0.344, t = 2.367, p = 0.000), PCQ (β =0.427, t = 4.063, p = 0.000), TDQ (β =0.341, t = 2.498, p = 0.000), IQ (β =0.414, t = 3.872, p = 0.000), and OCQ (β =0.311, t = 2.427, p = 0.000), were statistically significant at < 1% significance level.

Consequently, the independent components significantly improve CS. Consequently, all hypotheses were acknowledged. Table 11's beta coefficients show how much each variable contributes to the model. The significant influence of the LSQ on CS was explained by a high ß coefficient value.

Table 11. Coefficients.

Coefficients							
Model		Unstandardized coefficients		Standardized coefficients	T	Sig.	Decision
		B	Std. error	Beta			
1	(Constant)	2.958	0.578	2.958	5.119	0.000	
	PCQ	0.500	0.123	0.427	4.063	0.000	H_1: Accepted
	TLDQ	0.346	0.138	0.341	2.498	0.000	H_2: Accepted
	ODHQ	0.550	0.232	0.344	2.367	0.000	H_3: Accepted
	IQ	0.535	0.138	0.414	3.872	0.000	H_4: Accepted
	OCQ	0.525	0.124	0.311	2.427	0.000	H_5: Accepted

Note: Dependent variable: CS.

The β coefficient of the regression model, PCQ (0.427), is the strongest factor influencing online CS in the Riau Islands Province, followed by IQ (0.414), ODHQ (0.344), TLDQ (0.341), and OCQ (0.311). Therefore, equation is:

$$Y = a + b_1x_1(PCQ) + b_2x_2(TLDQ) + b_3x_3(ODHQ) + b_4x_4x(IQ + b_5x_5(OCQ) + e.$$

Y: Online Customer Satisfaction in Riau Islands Province.

The results of testing five hypotheses are presented in Table 12. Hypothesis 1 found that the PCQ in logistics service significantly influences online CS in Riau Islands province. Hypothesis 2 assesses the relationship between quality, timely delivery, and CS, finding that there are positive effects of quality, timely delivery on CS. Hypothesis 3 considers the relationship between order discrepancy handling quality and online CS, and testing found that order discrepancy handling quality significantly influence the online CS. Hypothesis 4 evaluates the linkage between information quality and online CS, and the findings show that the information quality significantly influences online CS. Hypothesis 5 assesses the relationship between order condition quality and online CS, finding that the significant influence of order condition quality on online CS.

Table 12. The hypotheses summary.

Hypotheses	Hypothesis	Decision
H_1	The PCQ in logistics service significantly influence the online CS in Riau Islands province	Accepted
H_2	The quality timeliness delivery in logistics service positively affects CS in Riau Islands province	Accepted
H_3	Order discrepancy handling quality in logistics service significantly influence the online CS in Riau Islands province	Accepted
H_4	The information quality in logistics service significantly influence the online CS in Riau Islands province	Accepted
H_5	Order condition quality in logistics service significantly influence the online CS in Riau Islands province	Accepted

5. CONCLUSION AND DISCUSSION

The first hypothesis—that the level of employee contact in logistics services has a substantial impact on online CS in the province of Riau Islands—was accepted, and it has been demonstrated that there is a substantial correlation between employee contact and CS. The results of the study showed that there was a strong positive correlation between CS in the Riau Islands Province and the quality of staff interaction in logistics service (β=0.427, p <.001, t=4.063). If consumers' wants and expectations are understood by the workers in the logistics service, then the consumer will be more satisfied with the logistics company's ability to meet their demands (Bitner et al., 1994). Thus, attributes crucial for logistics service providers, such as experience, empathy, problem-solving ability, and the ability to forge close bonds with clients, influence consumer opinions of the quality of the logistics services. Online CS in the Province of the Riau Islands will enhance with better employee involvement in logistical services.

The second hypothesis, which states that the provision of quality, timely logistical services has a favorable impact on CS in the province of Riau Islands, is accepted because there is a noteworthy correlation between these two variables. The findings of the regression analysis showed that in the Riau Islands Province, quality timeliness delivery had a significant positive impact on CS (β =0.341, p <.001, t=2.498), punctuality in service delivery. Efficiency in receiving, sorting, and shipping—particularly in the choice of means of transportation—is intimately tied to logistics workflow. Consumers in the logistics industry can obtain the services they require more readily because of technological advancements and globalization. Consumers expect prompt fulfillment of their orders due to their inability to tolerate waiting (Zailani et al., 2018). Delivery timeliness is crucial for logistics services since it increases consumer satisfaction. As a result, logistics firms need to increase delivery accuracy and speed.

According to Hypothesis 3, there is a substantial correlation between CS in the Province of the Riau Islands and order discrepancy handling in logistic services. The results demonstrated that the beta coefficient for order discrepancy handling in logistics services is (β =0.344, p <.001, t=2.367), suggesting a strong positive correlation between online CS and order discrepancy handling quality in the province of Riau Islands. Resolving order inconsistencies in service logistics can be costly and time-consuming for logistics providers. Logistics firms, however, must recognize that product returns are unavoidable in the fiercely competitive climate of today. More significantly, though, returns management can help reduce expenses, spot opportunities for improvement, forge closer bonds with clients, and support the long-term expansion of the business (Chen et al., 2017). Online merchants need to control the flow of merchandise that consumers return in a way that doesn't compromise their level of happiness.

The fourth hypothesis, which stated that the quality of the information provided by logistics services has a major influence on online consumer service in the province of Riau Islands, was accepted and demonstrated to be true. The beta coefficient, which is (β =0.414, p <.001, t=3.872), suggests that there was a significant positive correlation between online CS and information quality in logistics services in the province of the Riau Islands. According to Ellitan (2023) and Gaudenzi, Confente, and Russo (2020) as well as other research findings, better information quality translates into higher levels of consumer satisfaction. This result is in line with the theoretical framework, which states that since relevant and correct information reduces decision-making uncertainty, it is essential to enhancing

consumer happiness. When the dimension satisfies the criteria, it does not significantly increase consumer satisfaction, and failure to fulfill the information quality may lead to dissatisfaction (Zhang, Yuan, & Su, 2024).

The fifth and final hypothesis, which stated that order condition quality in logistics services has a substantial impact on online consumer service in Riau Islands Province, was likewise accepted. A substantial correlation was found between order condition quality in logistics services and online consumer service in Riau Islands Province. Based on the results, there was a significant positive correlation between the order and the beta coefficient value, which is (β =0.311, p <.001, t=2.427). The quality of logistical services in the Province of Riau Islands significantly influences the online CS. For internet buyers, the state of the merchandise when shipped, as well as prompt and thorough delivery, are critical factors. Inadequate protection of the order condition may result in product damage during delivery. Clients anticipate receiving their requested goods undamaged. If not, consumers might select a different supplier for the subsequent purchase. Thus, in order to ensure that the order is sent in good condition, it is necessary to identify the elements that may have an impact on its condition (Akıl & Mustafa, 2022; Zlatkovic, 2013). Logistics providers must handle orders safely and correctly to prevent product damage during transit. Numerous factors, including packaging and mode of shipping (Akıl & Mustafa, 2022; Mentzer et al., 2001), might have a detrimental impact on an order's condition.

6. RECOMMENDATION

6.1. Practical Recommendation

The purpose of logistics services is to increase client happiness and loyalty; therefore, the results of this study recommend the following: (1) To please clients and improve the quality of logistics services, logistics companies must strengthen service components and integrate them into their business operations. (2) The implementation of CRM systems needs to be a top priority for logistics companies in the Riau Islands Province. Employees can provide services to manage client relationships more skillfully with the use of technology. Staff members in direct contact with consumers can receive training in effective interpersonal and communication skills to better understand consumer requirements and preferences and provide more personalized service. When workers receive praise and recognition for their superior consumer service, they can be inspired to provide even better service. Improved interpersonal communication skills can increase consumer satisfaction with logistics services. (3) To meet consumer expectations regarding logistics services in the Riau Islands Province, one must focus on business aspects that can offer flexible delivery options, timely and accurate delivery, and efficient problem solving, clear and comprehensive quality information, and polite and friendly communication. In addition, logistics companies in the Riau Islands Province need to improve the quality of information, which can include creating an easy-to-use platform, offering reliable and up-to-date information, and improving communication channels. Logistics companies in the Riau Islands Province can increase their consumer base and improve their competitiveness in the internet market. (4) Service companies are encouraged to improve satisfaction in order to increase business client loyalty. This is due to the fact that methods that focus on improving one element while ignoring the implications of other elements are inadequate (Cronin Jr et al., 2000). Suppliers need to realize that simply completing orders will not be enough to gain consumer loyalty. They must pay attention to how consumers interact with them and receive orders. Business clients expect suppliers to deliver goods according to their specifications and facilitate efficient connections with the provider's available contact points when they place orders. If one or both of the LSQ qualities do not meet client expectations, it will affect service evaluation, consumer happiness, and, ultimately, future behavioural intentions.

6.2. Recommendation for Future Research

The current research examines PCQ, TDQ, ODHQ, IS, and OCQ. As a result, we propose that future studies examine the impact of a more thorough logistical service quality component on client loyalty and satisfaction. *Second*, the extent to which the study's conclusions are applicable to a larger population may be impacted by the study sample's

inclusion of online merchants or online shopping centres on the online consumer in Riau Islands. Other relationship quality constructs, including trust and commitment, which have been demonstrated to have a substantial explanatory power for loyalty, could be incorporated into the suggested model to improve its fit. By doing this, future researchers would be able to better understand how business consumers make decisions, and the model's predictive performance would be enhanced.

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