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Impact of Logistics Service Quality on E-shopper Satisfaction and Loyalty in Yangon: A Quantitative Study

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Abstract

Myanmar's e-commerce has been growing rapidly despite facing many challenges related to this newly established industry. Despite the nation's enormous growth in smartphone and internet usage, the infrastructure for e-commerce logistics is still in its infancy. Since there is a limited number of studies that have been conducted on e-commerce in Myanmar, this study stands out. The purpose of this study was to determine how e-commerce logistics impact Yangon's e-shoppers' satisfaction and loyalty. A quantitative approach was used to collect data from 400 e-shoppers in Yangon. A multiple regression analysis was conducted to investigate the relationship between six dimensions of logistics service quality (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) and customer satisfaction. The findings revealed a positive correlation between e-shopper satisfaction and loyalty as well as a statistically significant relationship between each of the six logistical service quality factors and customer satisfaction. Customer satisfaction increased the most due to reverse logistics, followed by order condition, delivery service, customer service, product quality, and information quality. For greater e-shoppers' attraction and loyalty, retailers in Yangon should concentrate on improving all six factors of logistics service quality dimensions. They will improve satisfaction and loyalty among e-shoppers, boosting sales and profits for retailers while enhancing the shopping experience for e-shoppers.

Keywords: E-commerce logistics, E-shopper, Logistics service quality factors, Loyalty, Yangon

Introduction

Electronic commerce (E-commerce) is regarded as one of the most significant and dynamic economic sectors today, as well as one of the key factors driving rising competitiveness (Cho et al., 2008; Singh & Srivastava, 2019; Wakil et al., 2020). Myanmar is emerging from decades of isolation with renewed and expanding support from global communities. According to Worldometer's analysis of the latest available United Nations data, as of Friday, January 26, 2023, Myanmar's (previously Burma's) population was 54,799,153. However, due to the subpar Internet and infrastructure, internet shopping is still a relatively new idea in Myanmar.

Facebook is the primary motivation for using the Internet, and it is connected to international social media with 20,609,500 Facebook users in Myanmar in December 2023. This was 36.3% of its entire population in December 2023, according to the statistics by NapoleonCat.com. Facebook thus became a target for online retailers looking to benefit from offering goods and services related to fashion products. In addition, several local and international online retailers are joining the Myanmar e-commerce sector in search of fresh prospects in social media (e.g., Shop.com.mm, which was owned by Alibaba Group Holding Limited.). In the absence of established e-commerce websites in Yangon, social media networks like Facebook serve as a platform for online transactions.

The infrastructure of online systems in Myanmar is still being developed, so even though many people are interested in buying things online, some people still prefer to shop in person as the traditional way due to the unfamiliar systems such as payment systems, concerns about incorrectly delivered goods, privacy and other risks. Furthermore, there has been little academic research on how the quality of logistics services affects electronic shoppers′（e-shoppers）satisfaction and loyalty in Yangon, Myanmar. Due to the country′s late development and lack of information openness, there is minimal consumer data accessible（Bhati et al., 2017）.

The Myanmar Consumer Report of 2019 surveyed e-shoppers and found that they encountered three categories of problems: direct problems caused by the act of online shopping, associated problems caused by activities required to complete online shopping, and opportunity costs incurred by consumers in terms of money, time, inconvenience, etc. in addition to the direct cost of buying goods. The most common direct problems reported by respondents included service providers failing to deliver goods that matched the characteristics of goods ordered by consumers, delivering goods later than the agreed-upon date, delivering low-quality goods, and failing to fulfil promises made in advertisements. These findings strongly suggested there was a critical need for improvement in the online purchase system, particularly in consumer loyalty and satisfaction.

The 2023 Myanmar Consumer Report echoed the concerns raised in 2019, highlighting persistent challenges that continue to plague the country′s e-commerce landscape. Product quality remained a top concern, with consumers still encountering mismatched descriptions, inferior goods, and even expired items. Trust in online payment systems also remained shaky, with anxieties surrounding data security and fraudulent transactions hindering full adoption. Furthermore, delivery woes persisted, with reports of delayed shipments, sluggish turnaround times, and inconsistent service further dampening consumer confidence. Deceptive advertising added another layer of frustration, as exaggerated claims and misleading product portrayals fueled customer dissatisfaction. These ongoing challenges emphasize the urgent need for robust consumer protection measures, improved seller accountability, and enhanced transparency within Myanmar′s digital marketplace. Only through addressing these concerns can e-commerce truly thrive and unlock its full potential in the region.

The purpose of this study was to determine how e-commerce logistics impact Yangon′s e-shoppers′ satisfaction and loyalty. In the study, the impact of logistic service quality factors on e-shopper satisfaction and the impact of e-shopper satisfaction on e-shopper loyalty in Yangon were investigated. Given the current restrictions on motorcycle use in Yangon, the study focused exclusively on consumers in the city who have shopped online. To accomplish the purpose of this research, questions regarding the logistics service quality characteristics that affect E-shoppers in Yangon, and the effect of e-shopper satisfaction on e-shopper loyalty in Yangon, needed to be explored.

In this study, E-commerce refers to transactions that take place between businesses and outside parties including clients, vendors, and distributors. It mostly entails online sales of products and services, where customers can conduct transactions through the seller′s website（Norazila Mat et al., 2016）. The terms ″traditional logistics″ and ″e-commerce logistics″ are often used interchangeably, but they represent distinct systems with unique characteristics and challenges. Traditional logistics is the management of the physical flow of goods from manufacturers to consumers through a network of warehouses, distribution centers, transportation providers, and retailers, focusing on cost-effectiveness and efficiency for bulk shipments. E-commerce logistics include everything from placing an order to receiving the final goods（Choi et al., 2019）. The capacity to deliver items that meet client satisfaction criteria is used to measure the logistics service quality, or LSQ（Yang

et al., 2010). E-commerce logistics focuses heavily on individual orders of varying sizes and destinations, catering to online purchases, whereas traditional logistics focuses on cost-effectiveness and efficiency, aiming for economies of scale over speed. The lines between traditional and e-commerce logistics are becoming increasingly blurred as companies adopt omnichannel strategies that integrate online and offline channels.

Efficient logistics ensures client satisfaction while using fewer resources. Logistics performance affects organizational performance when the supply chain is dependable, effective, and environmentally friendly in delivering the product to the final consumer. A supply chain consists of many members, and the efficiency of a supply chain depends on each member's efficiency (Patitad & Watanabe, 2022). In addition to being crucial to organizational success, logistics performance boosts a company's competitiveness by enhancing the supply chain's reliability and timeliness while lowering transaction risks and coordination costs (Masudin et al., 2021). The number of alternative routes will influence the logistics and the supply chain channel can consider more routes (Netirith & Narthsirinth, 2021).

Based on previous studies by Yang et al. (2010) and Choi et al. (2019), which concluded that information quality, product quality, delivery service, customer service, order condition, and reverse logistics have the strongest effect on customer satisfaction, this study investigated these six factors as determinants of logistics service quality, making them the independent variables in the study, and the two dependent variables were customer satisfaction and customer loyalty. These six logistics service quality factors were also stated in Hafez et al. (2021). However, in the current study, with "product condition" factor in that model was modified to be "order condition". These logistics service quality factors are defined in Table 1; the electronic survey questionnaires were designed using the definitions.

While previous studies have identified links between logistics service quality and e-shopper satisfaction and loyalty, several gaps remain unexplored in the context of Yangon. Existing research might not translate directly due to Yangon's unique socio-economic landscape and cultural expectations. Furthermore, delving deeper into specific aspects of service quality, incorporating moderating variables like product type or demographics, and analyzing the impact of reverse logistics practices offer opportunities for nuanced understanding. By addressing these gaps, this study aims to shed light on the specific factors influencing e-shopper satisfaction and loyalty in Yangon's evolving e-commerce environment, ultimately contributing to improved customer experiences and industry growth.

Table 1 Independent and Dependent Variables in online shopping

| Independent Variables	
Information quality	This factor encompasses the accuracy, reliability, and accessibility of product information. This includes product price, specifications, search functionality, and location information. High-quality information leads to increased customer satisfaction and loyalty.
Product Quality	Refers to the ability of a product to meet customer needs and expectations. It is a fundamental factor in creating customer satisfaction and is known to encourage more people to shop online. Assessments of product quality include measures such as product similarity to in-store purchases as well as authentic product feedback.
Delivery Service	Refers to the ability of a supplier to deliver the ordered product to the customer's desired location within the promised timeframe and at a reasonable cost. It encompasses factors such as adherence to delivery schedules, accurate delivery location identification, and cost-effectiveness. Efficient

Table 1 (Cont).

Independent Variables	
	delivery service plays a significant role in enhancing customer satisfaction, loyalty, and overall business success.
Customer Service	Refers to the responsiveness of an online retailer to customer inquiries and the quality of after-sales support. It encompasses aspects such as ease of contact, staff training, and problem-solving capabilities. Effective customer service positively impacts customer satisfaction, loyalty, and overall business success.
Order Condition	Refers to the state of the products delivered to customers. It encompasses the absence of damage or defects caused by poor handling or transportation. Ensuring good order condition is crucial for ensuring customer satisfaction, reducing returns, and minimizing negative customer reviews.
Reverse Logistics	Refers to the process of managing the return of goods from customers to the retailer or manufacturer. It encompasses factors such as ease of return, transparent return policies, and refund charges. Efficient reverse logistics practices can enhance customer satisfaction, improve customer service, and reduce costs associated with returns.
Dependent	
Customer Satisfaction	Refers to a customer's overall impression of their online shopping experience. It is influenced by factors such as the perceived quality of the product, the ease of the shopping process, and the level of customer service. Satisfied customers are more likely to make repeat purchases, recommend the business to others, and leave positive reviews. Understanding and improving customer satisfaction is crucial for the success of online businesses.
Customer Loyalty	Refers to a customer's inclination to make repeat purchases from a particular online retailer. It is strongly influenced by customer satisfaction and is characterized by behaviors such as repeat purchasing, positive reviews, and recommendations. Understanding and improving customer loyalty is crucial for the long-term success of online businesses.

Definitions summarized from Pan Wit Yee's independent study (Pan Wit Yee, 2023).

Methods and Materials

Conceptual Framework

This study proposes hypotheses based on the research model as shown in Fig. 1. To investigate the impact of logistics service quality factors of online shopping services in Yangon on e-shopper satisfaction and e-shopper loyalty, identifying and assessing the independent variables as listed and defined in Table 1, which also lists the dependent variables of customer satisfaction and customer loyalty.
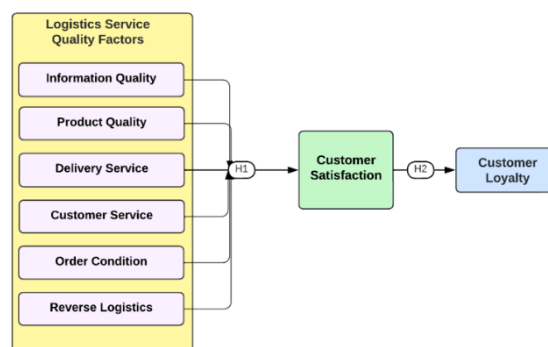
Figure 1 Conceptual framework

Research Hypotheses

Based on the conceptual framework and existing literature, the following hypotheses are proposed:

H1: There is a significant relationship between the logistics service quality factors, which are information quality, product quality, delivery service, customer service, order condition and reverse logistics, and customer satisfaction.

H2: There is a significant relationship between customer satisfaction and customer loyalty.

Research Design

This study employed a quantitative approach to the investigation. A structured questionnaire was used to collect data from a sample of e-shoppers in Yangon. A deductive research approach was chosen to test the applicability of an existing logistics service quality model in the context of Yangon.

Sample Size

A sample size of 385 was calculated using a 95% confidence level and a margin of error of 5%. A total of 400 responses were collected, and 397 were analyzed. A sample of 30 e-shoppers in Yangon was selected to participate in the pilot test.

Data Collection

The data for this study was collected from an electronic survey of online shoppers in Yangon. The electronic survey was administered via Facebook online shop pages using a QR Code that linked to the electronic survey from Google Forms. The online shops included an online retail store, a floor tiles store, and a bakery. The data was collected from August 5th to August 12th, 2023, for a total of 8 days.

Designing the questionnaire

The questionnaire was created in English and Burmese languages online on Google Forms. It included an introductory section that described the study's goal and substance. There were 33 questions across the three sections of the questionnaire. To gain a comprehensive understanding of customer experiences with logistics services in online shopping, this survey explored three key areas: (1) online shopping habits and preferences, uncovering participants' general e-commerce behavior; (2) logistics service quality, delving into six key dimensions (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) and their impact on customer loyalty and satisfaction; and (3) personal data, which helped characterize the demographic makeup of the sample. The second part of the electronic survey asked respondents to rate several statements about how satisfied they were with the transportation systems in Yangon and online purchasing on a Likert scale of 1 to 5, with 5 denoting " Strongly agree " and 1 denoting " Strongly disagree ". The terms customer and e-shopper were used interchangeably in the questionnaire.

Methods of Analysis

SPSS statistical software was used to analyze the data. Frequency analysis was used to analyze the demographic profile of the respondents. Pearson's correlation was used to determine the relationships between logistics service quality factors (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) and customer satisfaction and was also used to determine the relationship between customer satisfaction and customer loyalty. Linear multiple regression analysis was used to determine the logistics service quality factors that had the greatest impact on customer satisfaction. Linear regression was used to determine the impact of customer satisfaction on customer loyalty.

Results and Discussion

Pilot Testing Using Cronbach's Alpha

A sample of 30 e-shoppers in Yangon was selected to participate in the pilot test. Cronbach's alpha was used to measure the internal consistency reliability of the questionnaire. The overall Cronbach's alpha value was 0.989, indicating a high level of reliability, as shown in Table 2. The Cronbach's alpha values for each dimension of the questionnaire were also found to be acceptable, ranging from 0.783 to 0.981. These results suggest that the questionnaire is a reliable instrument for measuring e-shopper satisfaction with logistics services in Yangon.

**Table 2** Cronbach's Coefficient Alpha of Each Variable

Number	Variables	Cronbach's Coefficient Alpha
1	Information Quality (IQ)	0.911
2	Product Quality (PQ)	0.931
3	Delivery Service (DS)	0.948
4	Customer Service (CS)	0.962
5	Order Condition (OC)	0.783
6	Reverse Logistics (RL)	0.981
7	Customer Satisfaction (CST)	0.964
8	Customer Loyalty (CL)	0.960
Overall Cronbach Alpha for the entire Scale		0.989

Data Analysis

The data was analyzed using descriptive statistics, correlation analysis, and regression analysis. The original data set consisted of 400 observations. However, three observations (0.7%) answered "No" the screening question of "Have you ever bought something online in Yangon?" and were omitted from the data analysis. Therefore, 397 observations were used in the analysis.

Respondent's Social Demographic Profile

Respondents' demographics are shown in Fig. 2. Of the 372 respondents who participated in the electronic survey, 154 were men (38.8%) and 218 were women (54.9%) with 25 respondents not indicating gender (6.3%). The age distribution was 56 respondents below 20 years (14.1%), 244 respondents from 20 to 30 years (61.5%), 83 respondents from 31 to 40 years (20.9%), 12 respondents from 41 to 50 years (3.0%) and 2 respondents older than 50 (0.5%).

Gender

Age
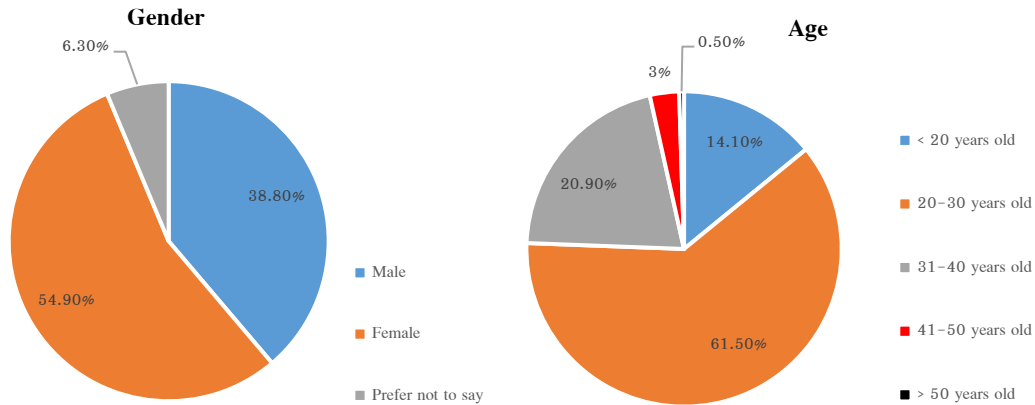
Figure 2 Graphs of Gender and Age

For the nationality distribution, 393 Myanmar nationals (99.0%) participated in the electronic survey while only 4 Non-Myanmar nationals (1.0%) participated. Respondents' education distribution is shown in Fig. 3. The educational background of the respondents included 72 (18.1%) who were high school graduates, 122 respondents (30.7%) had a diploma, 172 respondents (43.3%) had a bachelor's degree, and 19 (4.8%) had a master's degree. Twelve respondents (3.1%) were either still studying or did not share that information.
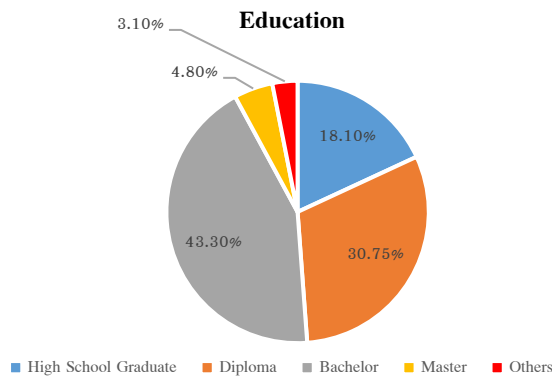
**Figure 3** Graph of Education

Income distribution, as shown in Fig. 4, included 58 respondents (14.6%) earning less than 200,000 Myanmar Kyat (MMK), approximately US$95 (Exchange Rate approx. 2,100 MMK to the US$), 188 respondents (47.4%) earning between 200,000 and 500,000 MMK (US$95 - US$237), 86 respondents (21.7%) earn from 500,001 to 700,000 MMK (US$237 - US$333). 22 respondents (5.5%) earn from 700,001 to 1,000,000 MMK (US$333 - US$476), and 25 respondents (6.3%) earn more than 1,000,000 MMK (US$476). Among the 18 respondents (4.5%), some were housewives, a few were business owners, and others were not willing to share the information.
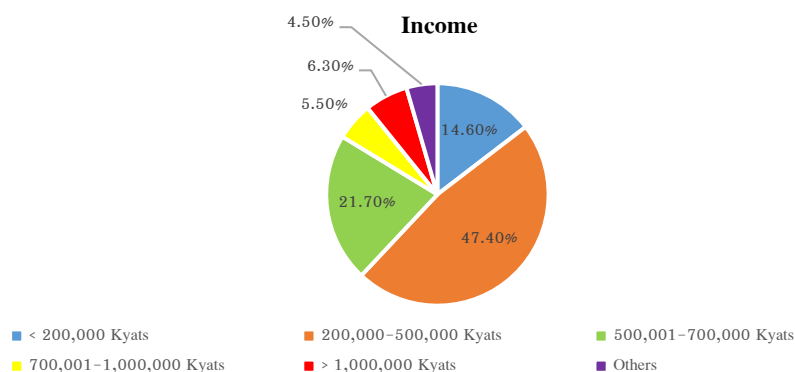
Figure 4 Graph of Income

Respondent's Purchasing Preferences

Of the 397 respondents used in the analysis, as shown in Fig. 5, only 185 respondents (46.6%) shopped online from 4 to 7 times per month, 91 respondents (22.9%) shopped 3 times or less, 78 respondents (19.65%) shopped from 8 to 10 times per month, while only 43 respondents (10.85%) shopped online for more than 10 times per month. The low percentage of respondents who have shopped online more than 10 times indicates that Myanmar customers are still hesitant to adopt online shopping. From the data, 192 respondents (48.4%) have shopped online for 3 to 5 years while 170 respondents (42.8%) have shopped 2 years of less and 35 respondents (8.6%) have shopped for 6 to 10 years. Only a few respondents have shopped for more than 6 years. Online shopping is still in its early stages of development in Yangon, as evidenced by the fact that only a small percentage of respondents have been shopping online for more than 6 years.
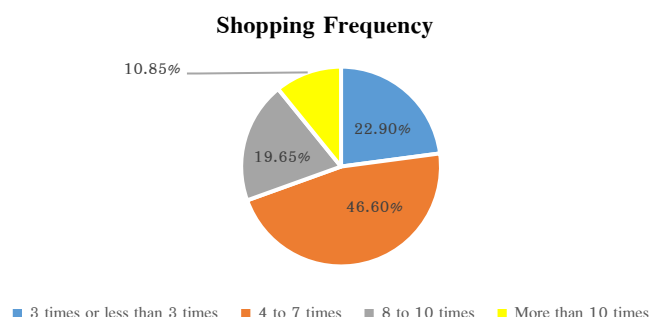
Figure 5 Graph of Shopping Frequency

The following are the most popular items purchased online in Yangon, in order of popularity: food and beverages, apparel and accessories, furniture and décor items, consumer electronics, auto and parts, books, movies, music and games, and health, personal care and beauty items. Online shopping is the clear preference for most consumers in Yangon, with 86.6% of respondents saying they prefer to shop online. Only 13.4% of respondents prefer shopping in stores. Most respondents prefer online shopping for its online discounts, variety of products, easy shopping experience, modern convenience, crowd avoidance, and shopping secrecy.

The most popular retailers among respondents are Facebook Live Sales, Food Panda, Shop.com, and BarLoLo.com. The most common modes of transportation for receiving parcels are cars, trucks, vans, and bicycles. A few respondents have received their products by walking. The most popular logistics providers in Yangon are Ninja Van and PSL. However, many respondents were not sure of the name of the logistics provider,

as the seller often delivers the products directly. 243 respondents (61.2%) prefer their online retailer to use their own fleet while 62 respondents (15.6%) prefer them to use a third-party logistics provider. This is due to customers valuing the convenience and reliability of having their orders delivered directly from the retailer. This also suggests that customers are more price-conscious, or they have had negative experiences with retailers using their own fleets in the past. On the other hand, 92 respondents (23.2%) do not think it matters. This may be because they are new to online shopping, or they are not as concerned about the delivery process as other customers.

The above statements are supported by the data, which shows that the majority of respondents consider the delivery fees to be very important while making a purchase online. The delivery speed and the information quality are also important after delivery fees. Positive reviews of products are equally important for e-shoppers in Yangon. Word-of-mouth recommendations and clear return policies are also important but to a lesser extent.

Respondent's Logistics Preferences

When asked how much they are willing to pay for delivery fees, 51.4% of respondents said they would pay a higher price for a better delivery service, as shown in Fig. 6. This suggests that a majority of online shoppers in Yangon are willing to pay for convenience and reliability when it comes to shipping. However, 24.2% of respondents said they prefer not to spend so much on delivery fees, and 23.9% said they do not want to pay for delivery fees at all, 0.5% of respondents said they would prefer either getting a discount on the delivery fees. This suggests that there is a significant minority of shoppers who are price-sensitive and would prefer to avoid delivery fees altogether.
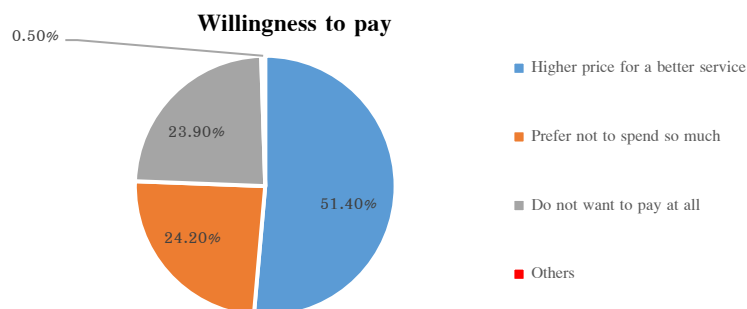
Figure 6 Graph of Payment Preferences

According to the electronic survey, 33% of respondents are not willing to pay more than 2,000 MMK (US 95c) for delivery fees, as shown in Fig. 7. 25.4% of respondents are willing to pay 1,500 MMK, 21.7% prefer not to pay, and 16.4% are willing to pay more than 2,000 MMK. Only 3.5% of the respondents did not specify the amount.

Preferred Amount
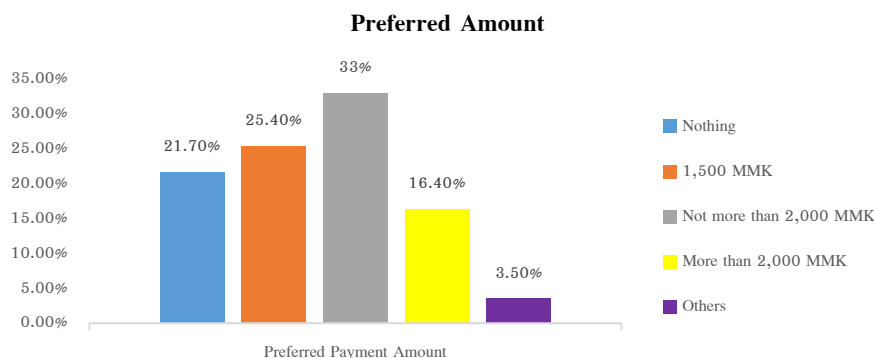
Figure 7 Graph of Payment Amount Preferences

The electronic survey found that 362 respondents (91.2%) would prefer to be notified of the exact time of their delivery. This suggests that online shoppers in Yangon value convenience and want to be able to plan their time accordingly. The remaining 8.8% of respondents were divided between those who did not want to be notified at all (23 respondents) and those who were unsure (12 respondents). This suggests that there is a small minority of shoppers who are not as concerned about the exact timing of their deliveries.

In terms of preferred delivery speed, 83.9% of the respondents expressed a preference for same-day shipping, 9.1% of the respondents did not prefer same-day shipping and 7.0% of the respondents were not sure. The small percentage of respondents who do not prefer same-day shipping may be concerned about the cost or the environmental impact of expedited shipping. The unsure respondents may be open to either same-day shipping or a slower delivery option, depending on the circumstances.

Pearson's Correlation Analysis

Pearson's correlation analysis has been used to test the relationship between the independent variables and the dependent variables. Correlation analysis was used to determine whether logistics service quality factors (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) and customer satisfaction are correlated.

Relationship between Logistics Service Quality Factors and Customer Satisfaction

The correlation results shown in Table 3 showed that there is a positive medium correlation between all the logistics service quality dimensions and customer satisfaction. This means that as the value of one logistics service quality dimension increases, the value of customer satisfaction also increases. However, the relationship is not strongly correlated. The Pearson correlation coefficient values between logistics service quality dimensions and customer satisfaction are as follows: information quality (IQ) with a value of 0.486, product quality (PQ) with a value of 0.478, delivery service (DS) with a value of 0.481, customer service (CS) with a value of 0.441, order condition (OC) with a value of 0.439, and reverse logistics (RL) with a value of 0.498. The results of this study suggest that all of the logistics service quality dimensions are important to customer satisfaction. However, information quality, delivery service and product quality appear to be the most important dimensions. This is because they have the highest correlation values with customer satisfaction.

The correlation coefficient value for reverse logistics (RL) is 0.498, which is the highest value among the other dimensions, and is not considered the most important dimension. The correlation values are only a measure of the strength of the relationship between two variables. They do not consider the practical significance of the

relationship. In this case, the practical significance of the relationship between reverse logistics and customer satisfaction may not be as great as the practical significance of the relationship between information quality, delivery service, product quality and customer satisfaction. This is because reverse logistics is a relatively rare event. Most customers will never need to use reverse logistics services. Therefore, even though the correlation value for reverse logistics is the highest, it may not be the most important logistics service quality dimension for improving customer satisfaction.

Table 3 Correlation results between LSQ and CST

		IQ	PQ	DS	CS	OC	RL	CST
IQ	**Pearson Correlation**	1	.510 **	.391 **	.312 **	.344 **	.370 **	.486 **
	Sig. (2 tailed)		<.001	<.001	<.001	<.001	<.001	<.001
PQ	**Pearson Correlation**	.510 **	1	.169 **	.418 **	.428 **	.343 **	.478 **
	Sig. (2 tailed)	<.001		<.001	<.001	<.001	<.001	<.001
DS	**Pearson Correlation**	.391 **	.169 **	1	.362 **	.228 **	.543 **	.481 **
	Sig. (2 tailed)	<.001	<.001		<.001	<.001	<.001	<.001
CS	**Pearson Correlation**	.312 **	.418 **	.362 **	1	.312 **	.209 **	.441 **
	Sig. (2 tailed)	<.001	<.001	<.001		<.001	<.001	<.001
OC	**Pearson Correlation**	.344 **	.428 **	.228 **	.312 **	1	.221 **	.439 **
	Sig. (2 tailed)	<.001	<.001	<.001	<.001		<.001	<.001
RL	**Pearson Correlation**	.370 **	.343 **	.543 **	.209 **	.221 **	1	.498 **
	Sig. (2 tailed)	<.001	<.001	<.001	<.001	<.001		<.001
CST	**Pearson Correlation**	.486 **	.478 **	.481 **	.441 **	.439 **	.498 **	1

Table 3 (Cont.)

	Sig.	<.001	<.001	<.001	<.001	<.001	<.001
	(2 tailed)						

**Correlation is significant at the 0.01 level (2-tailed)

N = 397

Relationship between Customer Satisfaction and Customer Loyalty

As shown in Table 4, there is a positive strong correlation between customer satisfaction (CST) and customer loyalty (CL) with a correlation coefficient of 0.745. Results show that all factors are correlated at 0.01 significance level. The correlation results in Table 4 showed that there is a positive strong correlation between customer satisfaction and customer loyalty. This means that as the value of customer satisfaction increases the value of customer loyalty also increases.

Table 4 Correlation results between LSQ and CST

		CST	CL
CST	**Pearson Correlation**	1	.745**
	Sig. (2 tailed)		<.001
CL	**Pearson Correlation**	.745**	1
	Sig. (2 tailed)	<.001	

**Correlation is significant at the 0.01 level (2-tailed)

N = 397

Regression Analysis

It is used to determine the logistics service quality factors that had the greatest impact on customer satisfaction.

Regression Analysis between Logistics Service Quality Factors and Customer Satisfaction

Six independent variables have significant values less than 0.05, which means that the respondents believe that these variables can affect their satisfaction. The significant level of information quality (IQ) has a p-value of 0.002, product quality (PQ) has a p-value of 0.002, delivery service (DS) has a $p<0.001$, customer service (CS) has $p<0.001$ 0.001, order condition (OC) has $p<0.001$ and reverse logistics (RL) has $p<0.001$. A p-value less than 0.05 indicates that there is a statistically significant relationship between the independent variable and the dependent variable. In this case, the independent variables (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) are all statistically significantly related to the dependent variable (customer satisfaction). Therefore, it can be concluded that these six variables affect customer satisfaction. Retailers who want to improve customer satisfaction should focus on improving these six dimensions of logistics service quality.

The beta coefficient (β) explained the relative importance of the factors in terms of their contribution to the variance. A higher beta coefficient indicates a greater contribution to the variance. Information quality (IQ) has a β value of 0.142, product quality (PQ) has β value of 0.151, delivery service (DS) has β value of 0.178, customer service (CS) has β value of 0.165, order condition (OC) has β value of 0.184 and reverse logistics (RL) has β value of 0.222, as shown in Table 5. This means that reverse logistics (RL) has the greatest

contribution to the variance in customer satisfaction, followed by order condition (OC), delivery service (DS), customer service (CS), product quality (PQ) and information quality (IQ).

Therefore, reverse logistics is the most important dimension of logistics service quality for improving customer satisfaction. It is important to note that the beta coefficients only measure the relative importance of the variables. They do not consider the practical significance of the relationship between the variables. In this case, it is possible that a variable with a lower beta coefficient could have a more significant impact on customer satisfaction than a variable with a higher beta coefficient.

Table 5 Regression analysis results between LSQ and CST

		Coefficients [a]				
	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig. (p value)
		B	Std. Error	Beta		
1	(Constant)	.540	.173		.3114	.002
	IQ	.130	.041	.142	3.135	.002
	PQ	.135	.043	.151	3.157	.002
	DS	.138	.037	.178	3.747	<.001
	CS	.141	.036	.165	3.870	<.001
	OC	.173	.039	.184	4.482	<.001
	RL	.159	.033	.222	4.874	<.001
		a. Dependent Variable: CST				

The F-statistic is a measure of the overall significance of the model. In Table 6, a $p<0.001$ indicates that there is a statistically significant relationship between the independent variables and the dependent variable. This means that the six logistics service quality dimensions (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) have a significant influence on customer satisfaction.

Table 6 F-test results between LSQ and CST

		ANOVA [a]				
	Model	Sum of Squares	Df	Mean Squares	F	Sig. (p value)
1	Regression	153.763	6	25.627	62.765	<.001 [b]
	Residual	159.238	390	.408		
	Total	313.001	396			
		a. Dependent Variable: CST				
		b. Predictors: (Constant), RL, CS, OC, IQ, DS, PQ				

As shown in Table 7, the R-squared value is a measure of how much of the variance in the dependent variable can be explained by the independent variables. An R-squared value of 0.483 indicates that 48.3% of the variance in customer satisfaction can be explained by the six logistics service quality dimensions. This means that the model can explain a significant amount of the variance in customer satisfaction, but there is still some unexplained variance. The results of this study suggest that the six logistics service quality dimensions are

important for improving customer satisfaction. However, there are still some other factors that can affect customer satisfaction that are not included in this model.

Table 7 Coefficient of determination examination results (LSQ and CST)

Model Summary [b]					
Model	R	R square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.701[a]	.491	.483	.63898	1.572
a. Predictors: (Constant), RL, CS, OC, IQ, DS, PQ					
b. Dependent Variable: CST					

Regression Analysis between Customer Satisfaction and Customer Loyalty

Customer satisfaction (CST) was found to have a positive significant effect on customer's loyalty ($p<0.001$) as shown in Table 8. A $p<0.05$ indicates that there is a statistically significant relationship between the independent variable and the dependent variable. As shown in Table 9, the R square of 0.554 (55.4%) shows the ability of customer satisfaction to contribute to customer loyalty with a percentage of 55.4%. This means that the model can explain a significant amount of the variance in customer loyalty, but there is still some unexplained variance.

Table 8 Regression analysis results between CST and CL

Coefficients [a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig. (p value)
1	(Constant)	.767	.130		5.889	<.001
	CST	.762	.034	.745	22.217	<.001
a. Dependent Variable: CL						

Table 9 Coefficient of determination examination results (CST and CL)

Model Summary [b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.745[a]	.555	.554	.60655	1.937
a. Predictors: (Constant), CST					
b. Dependent Variable: CL					

Hypothesis

Regression analysis was used to test two hypothesis models. The results showed that there is a significant positive relationship between all of the logistics service quality factors and customer satisfaction (Table 10). The results also showed that there is a significant positive relationship between customer satisfaction and customer loyalty.

Table 10 Hypothesis testing

Hypothesis	Results
H1: There is a significant relationship between logistics service quality factors which are information quality, product quality, delivery service, customer service, order condition and reverse logistics, and customer satisfaction.	Significant
H2: There is a significant relationship between customer satisfaction and customer loyalty.	Significant

Discussion

Analysis of the Results in Comparison to Previous Research

Based on a literature review by Yang et al. (2010) and Choi et al. (2019), several factors were identified as having the strongest impact on customer satisfaction: information quality, product quality, delivery service, customer service, and order condition, followed by reverse logistics. This aligns with the findings of Hafez et al. (2021), upon whose research model this study was based. Their results demonstrated that information quality, product quality, product condition, and reverse logistics are the most significant variables influencing customer satisfaction. Furthermore, their findings also revealed a strong positive relationship between customer satisfaction and customer loyalty. This study investigated the relationship between logistics service quality (LSQ), customer satisfaction (CST) and loyalty (CL) in the context of online shopping in Yangon, Myanmar. Our findings align with existing research by Hafez et al. (2021) in several key ways. This study also found that reverse logistics has the greatest contribution to the variance in CST, followed by order condition, delivery service, customer service, product quality, and information quality. This means that reverse logistics is the most important dimension of LSQ for improving CST in the context of Yangon.

Similarities with Existing Research

Positive Relationships: We, like Hafez et al. (2021), established strong positive relationships between all six LSQ factors (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) and customer satisfaction. Furthermore, both studies demonstrate a significant positive influence of customer satisfaction on customer loyalty. This consistent pattern underscores the crucial role of LSQ in fostering positive customer experiences that drive loyalty in the online shopping environment.

Importance of LSQ Improvement: Our findings, similar to Hafez et al. (2021), suggest that retailers seeking to enhance customer satisfaction and loyalty should prioritize optimizing LSQ across all dimensions. This encompasses providing accurate and timely information, ensuring deliveries are prompt and products arrive in good condition, offering excellent customer service, and facilitating efficient return and exchange processes. In essence, high‑quality logistics services are central to building customer trust and satisfaction, ultimately leading to increased loyalty.

Contextualizing New Insights

Beyond these clear similarities, our study also offers distinct insights relevant to the specific context of online shopping in Yangon.

Emphasis on Reverse Logistics: Our findings place a stronger emphasis on reverse logistics as the factor with the greatest contribution to customer satisfaction, exceeding information quality and product quality. This suggests that in the Yangon context, efficient return and exchange processes hold particular importance for customers.

This could be due to various factors, such as concerns about product quality upon arrival, sizing issues, or the need for easy post-purchase adjustments. This finding emphasizes the need for retailers operating in similar contexts to invest in robust reverse logistics infrastructure and policies to cater to customer expectations.

Order of Importance Variations: The results according to Hafez et al. (2021) showed that information quality, product quality, product condition and reverse logistics are the most significant variables related to customer satisfaction. While both studies identify the significance of all six LSQ factors, the relative order of their influence on customer satisfaction may differ between contexts. For instance, our study suggests that order condition plays a more significant role than delivery service in Yangon, potentially due to concerns about package damage during delivery. This highlights the importance of considering context-specific nuances when prioritizing LSQ improvement efforts.

Summary of Findings

The findings of this study, both aligning with and building upon existing research, shed light on the critical role of LSQ in shaping customer satisfaction and loyalty in online shopping. While the emphasis on reverse logistics and variations in factor prioritization offer valuable context-specific insights, the overall message remains clear: investing in a high-quality and comprehensive LSQ system is crucial for online retailers seeking to attract, retain, and delight their customers. Future research could further explore the influence of LSQ on customer loyalty in diverse geographic and cultural contexts, offering even more granular insights for retailers to tailor their strategies effectively.

Strengths and Weaknesses of the Research

The study has several limitations. First, the study was conducted in Yangon, Myanmar, and the findings may not be generalizable to other cities, countries or contexts. Secondly, the study used self-reported data, which is subject to bias. Lastly, the study was conducted in the context of three industries: bakery, floor tiles, and retail. The findings may not be generalizable to other industries. For example, the importance of reverse logistics may be different for different industries. Despite these limitations, the study provides valuable insights into the relationship between LSQ, CST, and CL in the context of online shopping. The findings of the study can be used by retailers to improve their logistics services and create a more satisfying and loyal customer experience. This study found that there is a positive relationship between LSQ and CST in online shopping in Yangon. Online retailers in Yangon can improve customer satisfaction by focusing on improving LSQ dimensions, such as information quality, product quality, delivery service, and customer service. This can lead to increased sales and profitability. Improving LSQ is important for online retailers in Yangon because online shoppers are demanding high-quality logistics services, the competition is fierce, and improving LSQ can help reduce costs.

Conclusion and Suggestions

Conclusion

This study investigated the relationship between logistics service quality (LSQ) and customer satisfaction (CST) and loyalty (CL) in the context of online shopping in Yangon. The study found that there is a significant positive relationship between all of the LSQ factors (information quality, product quality, delivery service, customer service, order condition, and reverse logistics) and CST. This means that as the quality of the logistics service increases, customer satisfaction also increases.

The study also found that there is a significant positive relationship between CST and CL. This means that as customer satisfaction increases, customer loyalty also increases. These findings suggest that retailers who want to improve customer satisfaction and loyalty should focus on improving the LSQ dimensions. This can be done by providing accurate and timely information about products and services, delivering products on time and in good condition, providing excellent customer service, and handling returns and exchanges efficiently. In other words, retailers can improve customer satisfaction and loyalty by ensuring that their logistics services are of high quality. The study also found that reverse logistics has the greatest contribution to the variance in CST, followed by order condition, delivery service, customer service, product quality, and information quality. This means that reverse logistics is the most important dimension of LSQ for improving CST.

General Recommendations and Implications

Beta coefficients only measure the relative importance of the variables, and they do not consider the practical significance of the relationship between the variables. In this case, it is possible that a variable with a lower beta coefficient could have a more significant impact on customer satisfaction than a variable with a higher beta coefficient. For example, even though reverse logistics (RL) has the highest beta coefficient, it is possible that product quality (PQ) has a more significant impact on customer satisfaction in practice. This is because product quality is often the first interaction that customers have with a retailer, and it can set the tone for the entire shopping experience. Ultimately, the best way to determine which logistics service quality dimensions are most important for improving customer satisfaction is to conduct a study that specifically measures the impact of each dimension on customer satisfaction.

However, given the fact that reverse logistics is a rare event, retailers should focus on improving the other logistics service quality dimensions that are more likely to affect customer satisfaction. By focusing on these dimensions, retailers can improve customer satisfaction and loyalty, even if reverse logistics is a rare event.

Logistics Providers: Focus on improving the dimensions of logistics service quality (LSQ) that are most important to customers. Collect survey data to measure customer satisfaction with logistics services. Use statistical analysis to identify the factors that most significantly impact customer satisfaction and loyalty. Prioritize improvement efforts on the factors with the highest sensitivity.

Retailers: Focus on improving the reverse logistics dimension of LSQ. Provide accurate and timely information about products and services. Deliver products on time and in good condition. Provide excellent customer service. Handle returns and exchanges efficiently. Educate employees about the importance of LSQ. Develop training programs for employees on how to improve LSQ. Set standards for LSQ.

Recommendations for online retailers in Yangon

(i) Understand your customers' preferences: Conduct surveys, analyze customer feedback, and gather customer data to understand what your customers want and need from your logistics services. Tailored logistics strategies can be implemented based on customer preferences, such as offering free shipping or fast delivery for customers who prefer your own fleet or providing discounts on shipping or a wider selection of products for those who prefer third-party logistics providers.

(ii) Set clear expectations: Provide accurate and timely information about delivery times, tracking information, and return policies to set realistic expectations for your logistics services. This transparency is crucial for building customer trust and satisfaction.

（iii）Partner with a reliable third-party logistics（3PL）provider：If you lack the resources to manage your own logistics operations, consider partnering with a reputable 3PL provider like Ninja Van or PSL in Yangon. These providers can help you optimize your logistics processes, improve efficiency, and enhance the overall delivery experience for your customers.

（iv）Invest in technology：Leverage technology advancements to enhance your logistics services. Implement tracking software to provide real-time shipment updates and utilize chatbots to address customer inquiries promptly and efficiently.

Recommendations for Future Research

Conduct the study in a different country or region to determine the generalizability of the findings. Utilize different data collection methods, such as interviews or focus groups, to gain a deeper understanding of the relationship. Include a wider range of variables, such as price and brand reputation, to provide a more comprehensive understanding of the factors affecting customer satisfaction. Employ a longitudinal design to track the same customers over time and establish causal relationships between the variables.

Author Contributions

Author 1（Pan Wit Yee）：Conceptualization of the research, development of methodology, collection of data and review of the manuscript.

Author 2（Piyawan Puttibarncharoensri）：Formulated the topic of the research, interpreted the analysed data, and reviewed and edited the manuscript.

Conflict of Interests

All authors declare that they have no conflicts of interest.

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