

Examining the Impact of the Third Party Logistics Delivery Satisfaction in Bringing Efficiency and Effectiveness

B. Latha Lavanya¹, Mohamed Abdur Raqueeb²

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Abstract

Purpose: In the past couple of decades, the manufacturing industry began to accept the necessity of analyzing third-party logistics delivery satisfaction.¹ Third-party logistics delivery satisfaction, aims to improve the overall customer experience and strengthen the relationship between 3PL providers. Additionally, the findings of the study can help 3PL providers to identify strategies to differentiate themselves in the market and attract new customers while retaining existing ones.

Methodology: The conceptual model was developed from literature sources and data collected using a structured questionnaire, the research study hypothesizes about the significant difference among the dimensions of the independent variables as predictors, predicting customer satisfaction.

Findings: The findings of the multiple regression state that significant in between 3pl delivery satisfaction and customer satisfaction. The findings of the correlation analysis state that there is a significant association between 3pl delivery satisfaction.

Keyword: Third Party Logistics; Service Quality; Cost Reduction; Information Availability; Timely Order Delivery.

INTRODUCTION

Global 3PL providers excel in managing the transportation of goods across different countries and continents. They leverage their

Author's Affiliation: ¹Associate Professor, ²MBA Second year, MEASI Institute of Management, Royapettah, Chennai 600014, Tamil Nadu, India.

Corresponding Author: Mohamed Abdur Raqueeb, MBA Second year, MEASI Institute of Management, Royapettah, Chennai 600014, Tamil Nadu, India.

E-mail: latha.lavanya@measiim.edu.in

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expertise in international freight forwarding, and coordinating various modes of transportation (air, sea, road, rail) to ensure efficient and timely delivery of shipments. At the national level in India, third-party logistics (3PL) providers play a crucial role in managing the logistics and supply chain operations for businesses across various industries. Third-party logistics (3PL) providers play a crucial role in managing and optimizing supply chains for businesses. Ackerman, K.B. (1996).² However, to ensure a successful partnership between 3PL providers and their clients, it is important to establish clear terms and conditions that define the scope of the service, expectations, and responsibilities of both parties. One key aspect of 3PL service quality is the accuracy and timeliness of

order fulfilment. The terms and conditions should specify the order cut-off times, lead times, and delivery schedules to ensure that the 3PL provider meets the customer's delivery requirements Aertsen, F. (1993).³ Additionally, the 3PL provider should be held accountable for any errors or delays in order fulfillment and provide a clear plan for resolving any issues that may arise Andersson, D. and Norman, A. (2002).⁵ Businesses can ensure that their 3PL provider is meeting their needs and delivering high quality service that ultimately leads to customer satisfaction.

Objective

To examine the impact of Third-party logistics delivery satisfaction.

Scope of the Study

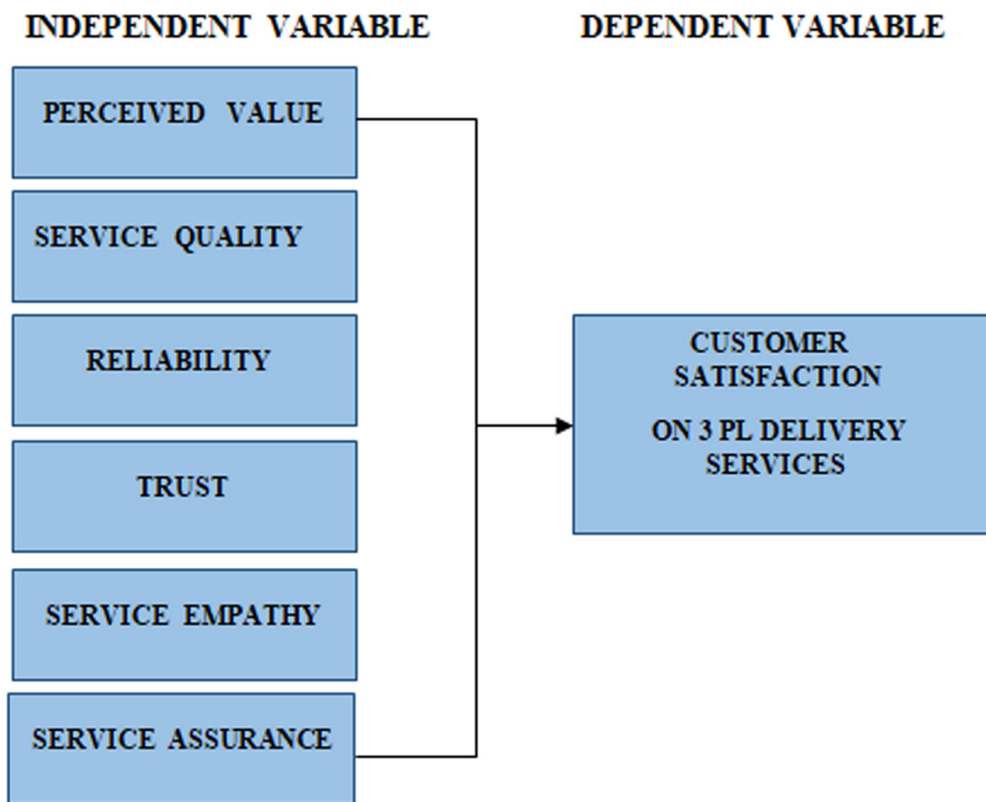
This study to understand the service quality

of third-party logistics to get an insight into the extent of customer satisfaction. The findings of the study will help the organization in measuring the influence of various dimensions of service quality on the customer level of service quality and understanding the efficiency of the third-party logistics administration frame work. The study encompassed different constructs of third-party logistics and their relative impact on customer satisfaction.

Flow Chart

Independent Variables: Perceived Value, Quality, Reliability, Trust, Service Empathy, and Service Assurance.

Dependent Variable: Customer Satisfaction on 3PL Delivery Service.



MATERIALS AND METHODS

Supportive Materials

Md. Uzir Hossain Uzir and Hussam Al Halbusi

(2021)¹⁷

Objective: The study was to investigate the effects of service quality, customer perceived value, and trust on customer satisfaction in the context of home delivery services in Dhaka, Bangladesh. The study aimed to analyse the relationships between these variables and contribute to the

development of a trust based satisfaction model for service providers. The findings provide insights for managers to enhance reliability and build trust with their delivery personnel.

Methodology: They gathered information from a sample of 259 individuals who had engaged in online shopping in Dhaka, the capital city of Bangladesh. The research was conducted using a survey method that employed a structured questionnaire. Before distributing the questionnaires, we conducted interviews with home delivery professionals to ensure the relevance and representation of the questionnaire items. Minor modifications were made to the language and descriptions based on a content validity test. Factor analysis was then conducted to identify and consolidate key variables, referred to as dimensions, related to service quality.

Findings: According to the results, customer satisfaction is influenced by service quality, customer perceived value, and trust. The impact of service quality on customer satisfaction and the effect of customer perceived value on satisfaction are both partially mediated by trust. These findings contribute to the development and validation of a satisfaction model that incorporates trust and perceived value, expanding upon the *Seroqual* model and aligning with expectation disconfirmation theory. The study offers valuable insights for managers in developing reliability and fostering trust among their service delivery personnel.

Dependent Variables: Customer Satisfaction.

Independent Variable: Customer Satisfaction, Service Quality, Customer Perceived Value, Trust: Home Delivery Service, Online purchase, PLS-SEM, Mediating effect.

Sample Size: 259

Sample: Customers

Link: <https://sci-hub.se/https://doi.org/10.1016/j.jretconser.2021.102721>.

Asyraf Afthanorhan (2019)

Objective: The objective of this research is to analyze the service quality gap between customers' perception and expectation at the University Sultan Zainal Abidin (Uni SZA) Library using Lib Qual. The specific goals are to identify the service quality dimensions that satisfy customers and to observe the impact of service quality on customer satisfaction. The research methodology involves a questionnaire survey distributed among 170 samples using simple random sampling. The data

will be analysed using covariance based structural equation modelling and importance performance analysis.³ The findings will provide insights for improving customer satisfaction and guide future research and practical implications.

Methodology: The psychometric properties of the main constructs were assessed using confirmatory factor analysis and structural analysis (AMOS 21.0; Arbuckle, 1995). Both constructs were simultaneously tested in a confirmatory factor model to evaluate reliability and validity (Afthanorhan *et al.*, 2018). CBSEM is a well known technique for handling multiple items and constructs, considering measurement errors and construct reliability (Al-Mhasnah *et al.*, 2018; McIntosh *et al.*, 2014). It benefits applied researchers interested in complex modeling, such as mediation, moderation, latent class analysis, and higher order models (Awang *et al.*, 2015; Aimran *et al.*, 2017a, 2017 b; Afthanorhan *et al.*, 2017; Aziz *et al.*, 2016). This technique helps determine measurement model quality by assessing global fitness (e.g., CFI, IFI, TLI, NFI, AGFI). Importance Performance Analysis (IPA) was performed to discuss operationalization, aiding researchers in identifying strengths and weaknesses of library service quality for improvements.

Findings: This research shows that service quality is crucial for improving customer satisfaction in university libraries. The study analyzed the gap between customer perception and expectation at UniSZA Library using Lib Qual. Six dimensions of service quality were identified: general services, materials search, library collection, staff, and environment. A questionnaire survey was distributed to 170 samples through simple random sampling and analysed using covariance-based structural equation modelling. The results indicate a significant impact of service quality on customer satisfaction, with the library environment and general service being particularly important. These findings have implications for enhancing customer satisfaction in academic library contexts.

Dependent Variables: Customer satisfaction.

Independent Variable: Service Quality Customer Satisfaction Lib Qual Covariance Based Structural Equation Modelling Importance Performance Analysis.

Sample Size: 170

Sample: Questionnaire Survey

Link: http://m.growingscience.com/msl/Vol9/msl_2019_16.pdf

Rafique Ahmed Khan¹ (2015)¹²

Objective: This study aims to assess the impact of 3PL on customer satisfaction in the pharmaceutical industry by examining various aspects and identifying weaknesses. It analyzes data from 250 respondents using 'Chi square' to propose measures for enhancing supply chain management. It evaluates employee satisfaction, monitors the competitive environment, and recommends improvements. The findings will provide insights for improving the 3PL system and enhancing understanding of logistics dynamics for companies.

Methodology: The research was descriptive in nature, utilizing quantitative data collected through a well structured questionnaire. Adopting a deductive approach, hypotheses were developed based on relevant literature. The study focused on five prominent pharmaceutical companies, namely Roche, Bosch, Bayer, Getz, and Sanofi Aventis, with a target population of approximately 1250 logistics department employees involved in 3PL operations. Convenience sampling was employed to collect primary data through the questionnaire, and interviews were conducted with select managers to explore the customer services and 3PL optimization relationship. The collected data were analyzed using the statistical tool Chi-square in SPSS, allowing for hypothesis testing.

Findings: The statistical results using chi-square are favorable. The first hypothesis indicates high satisfaction when 3PL meets expectations, with less dissatisfaction from quality decline. The second hypothesis shows high productivity leads to customer satisfaction, with reduced productivity not significantly lowering it. The third hypothesis emphasizes cost reduction's importance for satisfaction. The fourth hypothesis links access to desired information to satisfaction, while dissatisfaction arises when information is scarce. The fifth hypothesis highlights timely delivery's positive impact on satisfaction. Overall, third-party logistics (3PL) improves delivery processes and holds promising prospects for customer benefits.

Dependent Variables: Customer Satisfaction.

Independent Variable: Third Party Logistics, Service Quality, Increased Productivity, Cost Reduction, Information Availability, Timely Order Delivery and Customer Satisfaction.

Sample Size: 250 Sample: Questionnaire Survey

Lin: https://www.researchgate.net/profile/Muhammad-Khan-207/publication/344085379_75_Impact_of_Third_Party_Logistics_3PL_on_Customer_Satisfaction_in_Pharmaceutical_Industry_of_Pakistan/links/5f51bda6458515e96d2b3c54/75-Impact-of-Third-Party-Logistics-3PL-on-Customer-Satisfaction-in-Pharmaceutical-Industry-of-Pakistan.pdf

Satisfaction_in_Pharmaceutical_Industry_of_Pakistan/links/5f51bda6458515e96d2b3c54/75-Impact-of-Third-Party-Logistics-3PL-on-Customer-Satisfaction-in-Pharmaceutical-Industry-of-Pakistan.pdf

Yu Liu (2015)

Objective: A conceptual model that examines the determinants of consumers' perceived service quality and the impact of perceived service quality and customer expectations on customer satisfaction for third-party logistics services (3PLS).⁴ The objective also includes testing this model using structural equation modeling and analyzing data collected from Chinese logistics companies. The research aims to provide a theoretical foundation for academics and practical guidelines for logistics service providers in managing third-party logistics service aspects.

Methodology: The research methodology comprises three stages. Firstly, relevant literature is reviewed, and corresponding scales for measurement are identified. Secondly, sample items are generated for each construct and evaluated for reliability and content validity. Lastly, an extensive confirmatory analysis is conducted using the Customer Satisfaction Index (CSI) to test and validate the refined scales for reliability, construct validity, convergent validity, and the goodness-of-fit of the research model.

Findings: The theoretical and practical contributions to the understanding of 3PL service by developing a model of customer satisfaction. It finds that perceived service quality and customer expectations directly influence customer satisfaction in 3PL service. The five determinants of 3PL service quality have a significant impact on consumers' perceived quality. Additionally, the study emphasizes that merely introducing 3PL services is insufficient; service providers should address physical concerns and foster customer trust. Effective management should promote considerations at both objective and subjective levels to enhance customer satisfaction in 3PLS.⁵

Dependent Variables: Customer Satisfaction.

Independent Variable: Third-party Logistics service (3PLS), Perceived Service quality, and Customer expectation.

Sample Size: 152 Sample: Logistics Companies.

Link: An Empirical Study on Customers' Satisfaction of Third-Party Logistics Services (3PLS) | Atlantis Press (atlantis-press.com)

Samuel Nugroho and Sesilya Kempa (2019)¹⁸

Objectives: The impact of logistic service quality on customer retention, mediated by customer satisfaction, specifically in the context of rice producers distributing rice to rice retailers. The study aims to assess the relationship between logistic service quality and customer retention, as well as the influence of customer satisfaction on customer retention. The study intends to gather data from 36 rice retailers who have utilized logistic services at least twice and analyze the data using partial least squares (PLS). The expected outcomes of the study are to provide evidence of the effect of logistic service quality on customer retention and customer satisfaction and to demonstrate the significance of customer satisfaction in mediating the relationship between logistic service quality and customer retention.

Findings: Logistics services have a positive impact on customer satisfaction. When customers receive quality logistics services, their satisfaction levels increase, leading to a higher likelihood of repurchasing products from the company. This suggests that customer satisfaction resulting from good logistics services contributes to customer loyalty and repeat purchases. To maintain and enhance customer satisfaction, it is crucial for the management of rice-producing companies to recognize the importance of promptly addressing customer problems.⁹ It is recommended to establish a dedicated team responsible for receiving and handling customer issues effectively. By addressing customer problems promptly, companies can ensure customer satisfaction and foster loyalty.¹⁰

Methodology: The research utilizes a quantitative methodology, employing a quantitative survey approach. A purposive sampling technique is used, with a sample size of 36 rice shops that have utilized logistic services at least twice. Data is collected through a questionnaire distributed to customers in several cities in East Java. The Likert scale is employed to measure attitudes and perceptions, and the data is analyzed using Smart PLS, a software for partial least square (PLS) analysis, which is suitable for small sample sizes.

Dependent Variable: Customer Satisfaction

Independent Variable: Customer retention, logistic provider's service quality, retailer satisfaction.

Sample Size: 36

Sample: Rice Retailers Link: Sci-Hub | Logistic Service Quality and Customer Satisfaction to Customer Retention on Rice Producer Industry. SHS Web of Conferences, 76,01048 | 10.1051/

shsconf/20207601048.

Guoling Lang (2020)¹³

Objective: To address the lack of a quantitative description method for assessing customer satisfaction in logistics distribution services, the objective is to develop and implement a model that evaluates customer satisfaction. The model will specifically examine the influence of perceived service quality, expected service quality, and brand image on customer satisfaction and loyalty.

Methodology: The structural equation model to quantitatively analyze the causal relationships and impact of variables on customer satisfaction in logistics distribution services. The Mplus software was utilized to estimate the model parameters and assess the fit between the measured variable covariance matrix generated by the model and the sample covariance matrix. The accuracy of the parameter estimates improved with better model fit.

Findings: The proposed customer satisfaction model for logistics distribution service, based on the CCSI model, yielded positive results. It directly examined the impact of perceived service quality and cost on satisfaction. Using a structural equation model, the study confirmed the relationship between measured and latent variables, validating the model's applicability. These findings contribute to theoretical analysis methods in customer satisfaction and offer insights for improving logistics services. Further research is needed to explore demographic differences in customer satisfaction.

Dependent Variable: Customer Satisfaction

Independent Variable: Perceived service quality, Expected service quality, Brand image.

Sample Size: 600

Sample: Urban Area

Link: An Empirical Study on the Exploration of Factors Influencing Customer Satisfaction in Logistics Distribution Service – IOP science.

Methods

Reliability Analysis

Scale reliability is the ratio of true score variance to observed score variance. If there is less error inherent with in the scale, then the scale will yield consistent results across observations and research settings. In other words, reliability of an instrument is the degree to which it yields a

true score of the variable under consideration. Reliability is also defined as the extent to which any measuring instrument yields the same results on repeated trials. Several methods of reliability are used to establish the reliability of a measuring instrument. Cronbach Alpha is a reliability test conducted within SPSS (23) in order to measure the internal consistency i.e., reliability of the measuring instrument (questionnaire).

Source: Primary data

Cronbach'sAlpha	No of Items
0.644	38

Cronbach’s alpha test was performed to check the reliability of 38 items. The usual reliability coefficient ranges from 0 to 1, the greater the internal consistency of the items in the scale.

Hence forth, the result states that the overall score is 0.644 indicating internal consistency of the items which states more reliability.

Anova with Cochran's Test

The Scale Statistics			
Mean	Variance	Std. Deviation	No of Items
85.04	171.043	13.078	38

ANOVA with Cochran's Test						
Study Values		Sum of Squares	df	Mean Square	Cochran's Q	Sig
Between People		144.106	82	1.757		
Within People	Between Items	262.861	37	7.104		
	Residual	1898.954	3034	0.626	373.412	0
Total		2161.816	3071	0.704		
Total		2305.922	3153	0.731		

Grand Mean = 1.90

Source: Primary data

A test of ANOVA for the Cochran’s test was also performed since Cochran’s alpha is a most common measure of internal consistency (reliability) for the questionnaire. The Cochran’s Q value is 373.412.

Factor Analysis

Communalities		
Study Variables	Initial	Extraction
Gender	1.000	0.633
Age	1.000	0.739
Designation	1.000	0.631
PV1	1.000	0.772
PV2	1.000	0.610
PV3	1.000	0.629
PV4	1.000	0.736
PV5	1.000	0.647
T1	1.000	0.731
T2	1.000	0.684
T3	1.000	0.665
T4	1.000	0.804
T5	1.000	0.703
SQ1	1.000	0.738
SQ2	1.000	0.801
SQ3	1.000	0.789

SQ4	1.000	0.773
SQ5	1.000	0.785
E1	1.000	0.738
E2	1.000	0.734
E3	1.000	0.628
E4	1.000	0.772
E5	1.000	0.702
R1	1.000	0.788
R2	1.000	0.736
R3	1.000	0.795
R4	1.000	0.763
R5	1.000	0.687
CS1	1.000	0.679
CS2	1.000	0.774
CS3	1.000	0.729
CS4	1.000	0.692
CS5	1.000	0.641
CS6	1.000	0.676
CS7	1.000	0.817
CS8	1.000	0.679
CS9	1.000	0.804
CS10	1.000	0.704
Extraction	Method:	Principal Component Analysis.

Source: Primary data

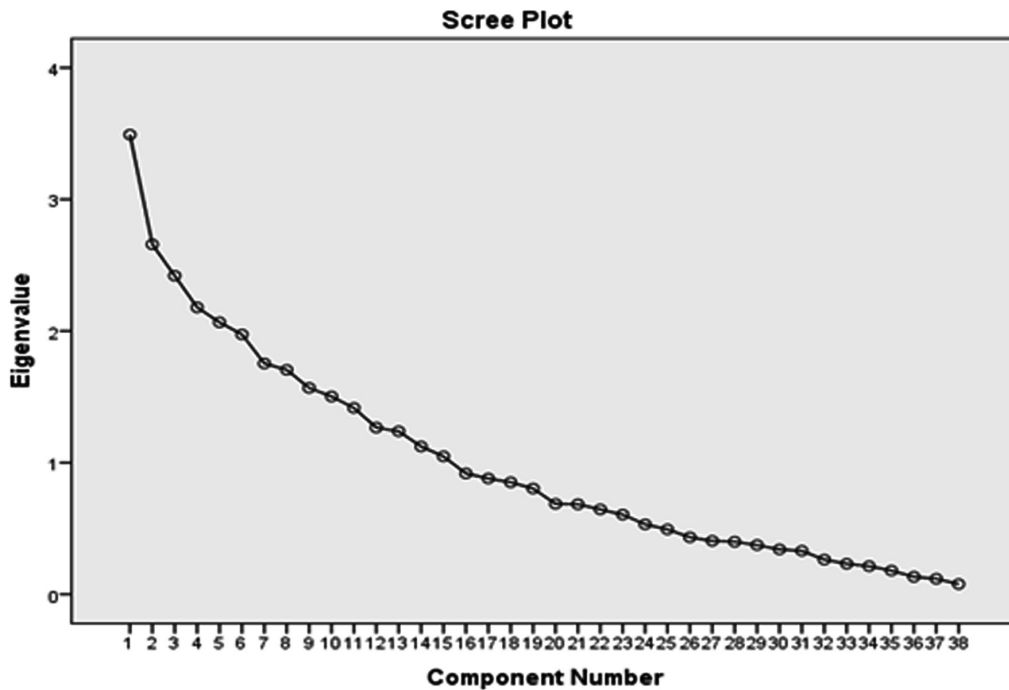
KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.671
Approx. Chi-Square		70.079
Bartlett's Test of Sphericity	df	15
	Sig.	.000

The extraction for the perceived value is 0.772, Trust is 0.804, service quality is 0.801, Empathy is 0.772, Reliability is 0.788, and Third party logistics delivery satisfaction is 0.804 as shown in table 6.

Source: Primary data

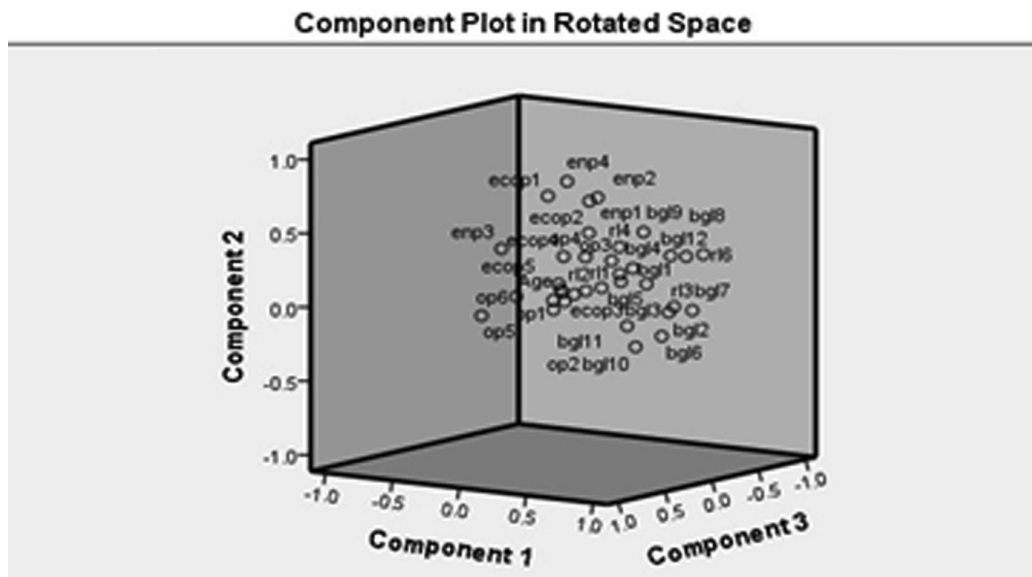
Kmo Measures

As the KMO and Bartlett's Measures are 0.671 then it is a mediocre value.



Source: Primary Data

Chart 1 Showing The Screen Plot



Source: Primary Data

Chart 2 Showing Component Space

The component plot in rotated space provides visual representation of loading plotted in 2-dimensions space. Variable in rotated component

matrix by magnitude of overloading are not suppressed.

Correlations

		Correlations						
Study Variables		Customer Satisfaction	Perceived Value	Trust	Service Quality	Empathy	Reliability	
Pearson Correlation	Customer Satisfaction	1.000						
	Perceived Value	0.043	1.000					
	Trust	0.245	0.191	1.000				
	ServiceQuality	0.033	0.032	0.228	1.000			
	Empathy	0.228	0.164	0.411	0.485	1.000		
	Reliability	-0.005	0.142	0.114	0.411	0.416	1.000	

Step Wise Multiple Regression

Model Summary										
Model	R	R Square	Adjusted R Square	Std.Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.24	0.06	0.048	0.273	0.06	5.151	1	81	0.026	1.29

a. Predictors: (Constant), Trust, Empathy, Reliability, Service Quality, Perceived Value.

b. Dependent Variable: Customer Satisfaction

Model Summary

Null Hypothesis (H₀): There is no significance difference among the dimensions of the independent variables as predictors, Third party logistics delivery satisfaction.

Alternative Hypothesis (H₁): There is significance difference among the dimensions of the independent variables as predictors, Third party

logistics delivery satisfaction.

Inference:

The above regression table summarizes the model. Where, R represents the multiple correlation coefficient with a range lies between -1 and +1. Since the R value is 0.245 it means Third party logistics delivery services has positive relationship with customer satisfaction.

Anova

Anova						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	0.384	1	0.384		
	Residual	6.037	81	.075	5.151	0.026b
	Total	6.421	82			

a. Dependent Variable: Customer Satisfaction

b. Predictors: (Constant), Trust, Empathy, Reliability, Service Quality, Perceived value

Inference

From the above ANOVA table F value is significant (sig value is less than 0.05) it means Dependent variable below the line marketing value

percentage is not reliable.

Inference

The above regression model coefficient table

Coefficient Table

		Co efficients										
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics		
		B	Std. Error	Beta			Zero order	Partial	Part	Tolerance	VIF	
1	Constant	1.707	0.15		11.349	0						
	TV	0.19	0.084	0.245	2.27	0.026	0.245	0.245	0.245	1	1	

a. Dependent Variable: Customer Satisfaction

shows the coefficients for responsibility that helps in analysing customer loyalty. A low significance value of less than 0.05 is shown for the variables.

Thus, The table concludes that the coefficients were statistically significant.

Regression Equation:

$$Y = ax + b$$

$$Y = \text{Constant} + \text{Satisfaction}$$

$$Y = 1.707 + 0.190$$

Excluded Variables

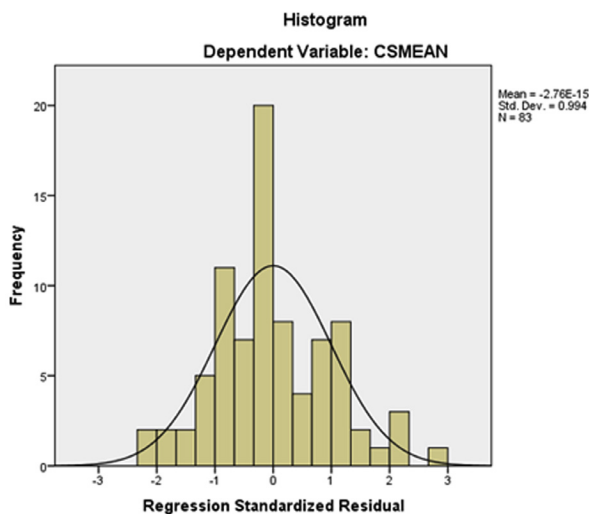
		Excluded Variables						
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Perceived value	-.004b	-0.038	0.969	-0.004	0.963	1.038	0.963
	Service quality	-.024b	-0.214	0.831	-0.024	0.948	1.055	0.948
	Empathy	.154b	1.305	0.196	0.144	0.831	1.204	0.831
	Reliability	-.034b	-0.309	0.758	-0.035	0.987	1.013	0.987

a. Dependent Variable: Customer Satisfaction
 b. Predictors in the Model: (Constant), Trust, Empathy, Reliability, Service quality, Perceived Value

Inference:

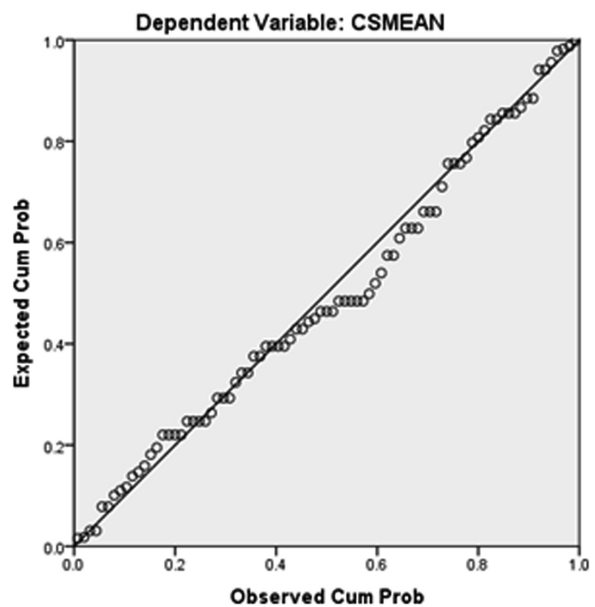
The above excluded variables table shows that Trust, Empathy, Reliability, Service Quality, perceived value are excluded.

standard deviation value is 0.994 and the N value is 83.



Histogram

Normal P-P Plot of Regression Standardized Residual



Scatter Plot

Inference

The chart represents that the mean value is -2.76,

RESULTS AND DISCUSSION

The research shows strong association between perceived value of logistics service and customer satisfaction, so companies can take steps to increase it by building its marketing campaign, thoroughly explaining its service and their competitive advantage. This can help to boost customer satisfaction.

Companies can increase their trust by offering free trial service and building their brand value.¹¹

The company must be quite famous or known in the community for the customers to have trust on their company.¹⁴

Companies can increase their reliability by showing their achievement (the various achievements from external certification boards) and statistics (the number of customers served and/or the number of packages delivered, number of shipments cleared, etc.).¹⁵

Companies can increase their service quality by understanding the competition, the latest trends in the industry, government compliances, increasing process efficiency and hiring the best staff. All these will surely make the service quality much better.

Companies can increase their service assurance by showing their achievements, records and statistics and offering customers a free trial to assure them of their brilliant service. Companies can increase their service empathy by providing customer service rating cards, suggestion boxes, and training their staff to be more courteous and respectful while dealing with customers.

Companies can encourage their customers to share suggestions for process enhancements, cost savings, and innovative solutions. Regularly evaluate and implement improvements to optimize the delivery process.

Companies can improve their over all services by providing better service, adjusting to more competitive pricing and making sure customers are satisfied by giving out feedback forms.

CONCLUSION

Logistics customer satisfaction can help companies boost sales, increase revenue and most importantly, build a strong brand value with ease. This research has identified six of the many factors which are responsible for customer satisfaction, perceived value of the service, reliability, trust,

service quality, service assurance and service empathy.¹⁶ The research proves the association of these variables with customer satisfaction and gives suggestions on how to improve each of these variables.

Customer satisfaction is also crucial for self-assessment and to understand the needs and preferences of the customer. In the logistics scenario, the products must be delivered on time with no damages (service quality), the personnel must be respectful and kind to the customers (service empathy), the customer must not feel worried about the service (service assurance), the company must be reliable and trustful (reliability and trust) and the public must have a good opinion of the company (perceived value).¹⁸ All these factors are studied extensively in this research and proven with statistics.

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Conflict of Interest:

I certify that there is no actual or potential conflict of interest in relation to this article. If any conflict exists, please define here after: Conflict (if none, "None" or describe financial interest/arrangement with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of interest in the context of the subject of this article).

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