Logistics service quality in Vietnam

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Abstract
A survey of 227 logistics customers showed that customer loyalty is directly positively predicted by perceived customer service satisfaction and indirectly by information technology. These findings are helpful in directing the attention of Vietnam's logistics managers to recognition of the importance of service quality in addition to information technology investment.

Keywords: logistics, service quality, information technology

BACKGROUND

Vietnam's logistics performance indices (customs clearance, logistics infrastructure, international shipments, logistics competence, tracking and tracing capability, timeliness of shipments) have not been much improved for recent years. Specifically, the World Bank evaluated the country as the 53rd rank in 2007, 2010, 2012 and modestly up to the 48th in 2014 (Table 1). Benchmarked with other nine Southeast Asian countries, Vietnam ranks the fifth in terms of LPI rank. At the firm level, competition to attract and retain customers is getting intense as more and more enterprises have entered this industry. According to the website of Vietnam Freight Forwarder Association (VIFFAS), until 2014 more than 1,200 logistics firms of small or medium size have been providing some logistics service in Vietnam. However, for recent years a moderate number of foreign firms have proven their capabilities for total logistics or third-party logistics (3PL) whereas a majority of local firms are limited to a single or fragmented service function, mainly freight forwarding (Frost and Sullivan, 2007; KinhteSaigon, 2014; Nguyen, 2012; Thuong, 2013; VietnamNews, 2013). Due to this capability limitation, the outnumbered local firms reportedly occupy only about 20 percent of the domestic logistics market leaving a large cut of the logistics cake for the foreign firms (ibid).

Table 1 – Vietnam's logistics performance index (LPI) Source: the World Bank (2014)

Year	LPI Rank	LPI Score	Customs	Infrastructure	International Shipments	Logistics competence	Tracking & tracing	Timeliness of shipments
2014	48	3.15	2.81	3.11	3.22	3.09	3.19	3.49
2012	53	3.00	2.65	2.68	3.14	2.68	3.16	3.64
2010	53	2.96	2.68	2.56	3.04	2.89	3.10	2.44
2007	53	2.89	2.89	2.50	3.00	2.80	2.90	3.22

While it may take years for the country to improve some LPI indices, the firms are seeking short-cut ways to improve service quality, one of which is to invest in information technology for tracking and tracing capability. Moreover, dramatic technological progress is creating unprecedented opportunities for improving logistics efficiency. Information technology and internet help shippers and truckers share information to use some of the idle capacity of warehousing space. Technology also increases customers' satisfaction by reducing cycle time and raising order accuracy. For instance, in a large distribution center where a huge number of inventory items enter, exit and move to customers every day, accurate identification of the items are very important to save time and cut losses due to inaccuracy. Information technology also saves operations and supply chain costs as it is paperless. Such emerging technology as Automatic Assets Identification Technology (AAIT) offers value added such as visibility, traceability, reduced response time, improved process and operations and reduced inventory (Ozdemir, 2010). While the role of information technology in improving information quality in service delivery is obvious, it does not guarantee customers' loyalty. Customers' behavior to continue with a service provider also depends on their perceptions on the quality of the services they have received. The objective of this study is to how information quality is associated with customer loyalty and how customer satisfaction mediates this relationship. The scope of this study covers the quality of logistics service delivered by Vietnam's logistics firms based in Ho Chi Minh City after its accession to the World Trade Organization in 2007.

LITERATURE REVIEW

Information Quality and Loyalty

The resource-based perspective holds that information technology is a resource for competitive advantage (Barney, 1991; Porter, 1998, 2008). Information and Communication Technology (ICT) offers opportunities to exploit existing customer relationships, and to identify customers' wants in order to establish relationship with them, to better serve them and to generate sustainable values (customer relationship management). Information quality in logistics is concerned with such issues as the timeliness, accuracy, relevance, and format of information generated by an information system. Information quality provided by advanced information management systems, such as warehouse management system (WMS), integrated system such as enterprise resources planning system (ERP), real-time data systems, among others, are now generating easy-to-use format of information for logistics customers, better order processing quality. Specifically in logistics service, IT helps customers continuously update order delivery information (e.g. through Web portals). Electronic data interchange (EDI) helps with prompt customs clearance. Order management software or applications also save time for customers. For example, customer and order information is entered at a computer at one time and customers can retrieve all related information whenever and wherever they are. Investments in complex information systems also make customer hard to quit its familiar service provider or increase switching costs for them. Switching costs are related to economic costs incurred to a customer who wants to switch to another provider. Some companies use a customer-retention strategy which is based on switching cost concept. They issue commercial policies for repurchases and retention (i.e. rewarding tools). This strategy is called "lock-in" strategy (Shapiro & Varian, 1999). The proposed hypothesis for this relationship is below.

Hypothesis 1 (H1): Information quality used in logistics services is positively associated with customer loyalty.

Customer Satisfaction and Loyalty

Customer satisfaction is considered an attitude or satisfaction can be a person's feelings of pleasure. Some authors define customer satisfaction as a response (cognitive or affective) or reaction to the evaluation of the perceived discrepancy between the previous expectations and actual experience about product or service as perceived after consumption (Kotler, 2000). According to the law of effect, people tend to repeat behavior whose consequences bring pleasure or satisfaction to them. If a service is pleasant to a customer, they would have behavior of repeating the purchase. In business loyalty is a long-term commitment to repurchase some goods or service involving cognitive attitude toward the selling firm (Stank et al, 2003). Service loyalty can be understood as the degree to which a customer exhibits repeated purchasing behavior and considers only using this provider when a need for this service exists. The relationship between customer satisfaction and loyalty has been studied in many previous studies (Fornell, 1992; Oliver, 1999; Sivadas & Baker-Prewitt, 2000). They suggested that high customer loyalty is mainly predicted by high customer satisfaction. Based on this relationship suggestion, the following hypothesis is proposed:

Hypothesis 2 (H2): Customer satisfaction with logistics services is positively associated with loyalty to logistics service providers.

In the process of service delivery, logistics customers have to go from order placement to order receipt processes. During these processes there is interaction between logistics service provider and the customer. The loyalty of a customer may result from how satisfied he is during the process of contacting service providers, not just from the quality of information provided by advanced information systems. Multiple factors such as the server's knowledge, behavior, feedback, complaint handling skill and courtesy impact their overall satisfaction. Therefore, the researcher wants to test whether the relationship between the information quality and loyalty is just indirect and whether customer satisfaction plays a mediating role to bridge the information quality and loyalty.

Hypothesis 3 (H3): Customer satisfaction mediates the relationship between information quality and loyalty.

METHODOLOGY

Population and Sampling

Quantitative approach is applied for this study which requires a survey. The researcher follows non-probability sampling method because the chance of each case being selected from the total population (about 1,200 logistics firms) is not known. The sample is taken in Ho Chi Minh City, the biggest trading city in Vietnam. The researcher was able to receive 227 valid responses to those questionnaires distributed to logistics customers. This sample size of larger than 200 is enough for analysis (Comfrey & Lee, 1992).

Measurement

The dependent variable is customer loyalty. The independent variables include information quality, customer satisfaction on logistics service quality. These variables are measured on 5-point Likert scale as follows: 1 = "totally disagree", 2 = "disagree"; 3 "neutral"; 4 = "agree"; 5 = "totally agree". The control variables include time of using service, types of enterprise. Customers having had a long-term contract with a certain logistics provider will keep on with their contract or be loyal to their provider. Foreign companies, especially big ones, have high standards for selecting logistics service providers. As local providers are not technically in position to provide highly-demanding services for them, the foreign companies use services provided by foreign logistics companies, usually 3PL companies (Table 1).

Table 2 - Instruments

Code	**Variables**	**Measurement**	**Sources of variable(s)**
CONTROL VARIABLES			
CON1	Time of using service	Nominal	Self-developed
CON2	Type of enterprise (ownership)	Nominal	
INDEPENDENT VARIABLES			
Information Quality			
IQ1	Application of IT to serve customers;	5-point Likert scale	(Mentzer, Flint & Hult, 2001; Thai, 2013)
IQ2	Readiness to apply new technology in order to better customer service		
IQ3	Adequacy of order information.		
Customer Satisfaction			
CS1	Impression about logistics service		(Mentzer et al., 2001; Thai, 2013)
CS2	Feeling satisfied about logistics service		
CS3	Satisfaction with service quality		
DEPENDENT VARIABLE			
LO1	Continuous use of service	5-point Likert scale	Thai (2013)
LO2	introducing this service provider to others		

Data Collection and Analysis

It is important to take the pilot test or pre-test the questionnaire before the real survey in order to ensure that the respondents really understand what we want to ask in the questionnaire, and to check if systematic error is present. Around ten people are picked to complete the pilot test by answering the questionnaires and the researcher take their feedback about the content, the use of questionnaire words, the order of questions and so on so that the researcher modifies the questionnaire for better real survey. Since the target of the research is at cargo terminals and ports in Ho Chi Minh City, the researcher decided to come there and distributed directly the questionnaires to respondents as many as possible with the minimum amount of 250. By doing that way, the researcher could ensure that the questionnaire would be collected right after the respondents finished. Mediation analysis is accomplished with three steps (Baron & Kenny, 1986a, b; Judd & Kenny, 1981; MacKinnon & Dwyer, 1993). The first step is to determine the effect of the independent variable on the dependent variable. The second step is that the effect of

the mediator on the dependent variable is determined. Then we determine the effect of the independent variable on the mediator. The purpose of the mediating analysis is to test if the relationship between the information quality and loyalty is mediated by perceived satisfaction on customer services.

FINDINGS

Descriptive Statistics

Nearly 90% of the respondents are business customers. Out of 227 respondents, 154 belong to join-stock companies; 42 state-owned enterprises and 31 foreign direct invested firms. Services which customers use the most include customer brokerage (87%), forwarding (87%) and international transport (63%). Types of cargo most delivered by customers are FCL (full-container load) cargo (76%), LCL (less than container load) cargo (70%), and perishable cargo (32%). A majority of business customers (90%) have been using logistics services from the same provider in one year or more. Figures 1 to 5 present the average scores of logistics service quality based on a set of quality dimensions including 1 - customer focus; 2 - order fulfillment; 3 - order timeliness; and 4 - information quality.

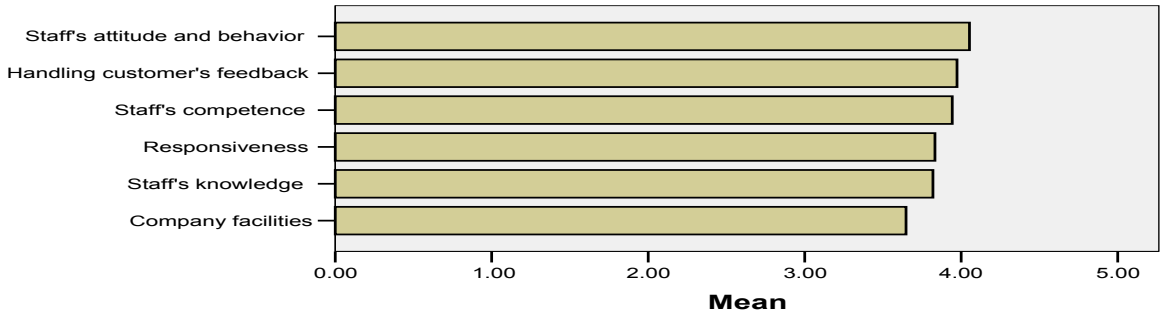

Figure 1 - the average score of customer focus quality

Among six items, the quality of staff's attitude and behavior is perceived as the highest, then feedback response as the second. However, customers did not highly value the facilities of the logistics company.

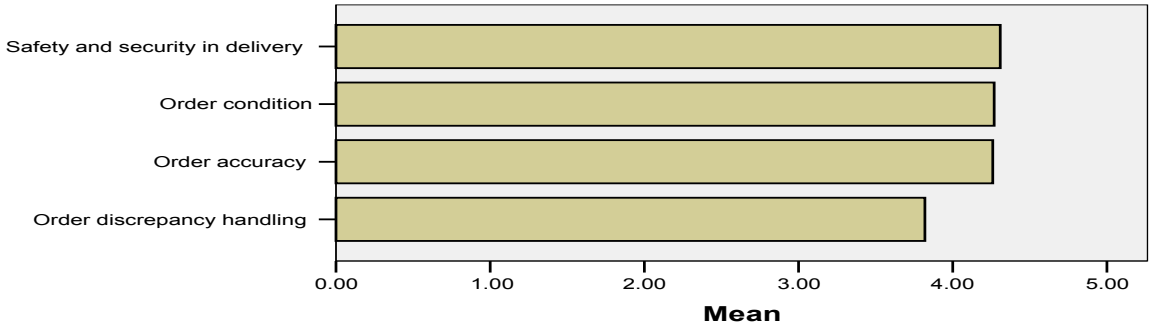

Figure 2 - The average score of order fulfillment quality

Among four items to measure order fulfillment quality, the quality of order discrepancy handling

is the worst. It reflects that sometimes there are some mistakes in ordering and receiving but the way the company resolve this problem is not satisfactory.

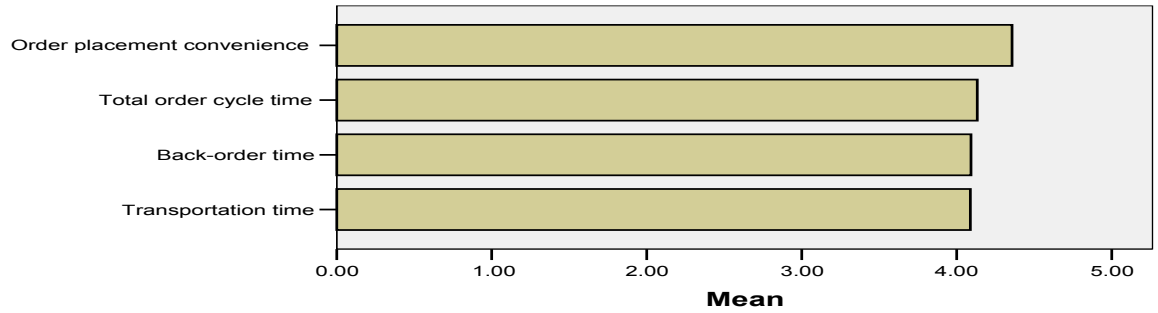

Figure 3 - The average score of timeliness

Among four items to measure timeliness, the order placement convenience is ranked the highest. Things like web portal and order management software make it easier for customers to place orders.

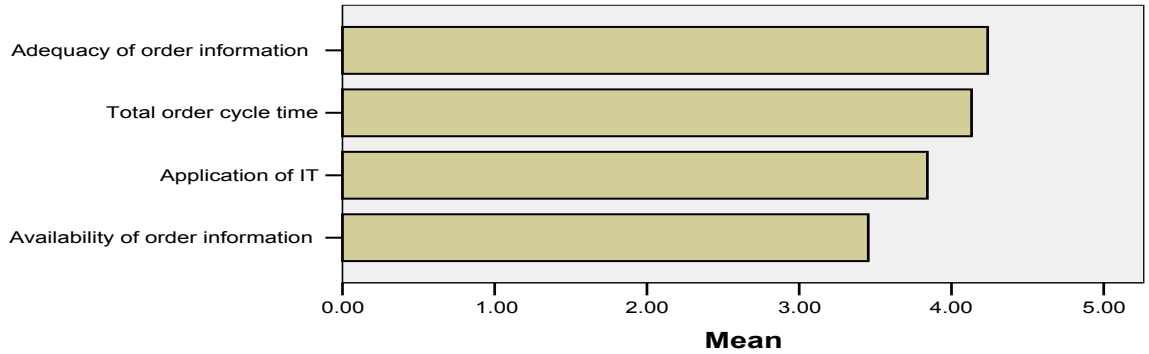

Figure 4 - The average score of information quality

The information related to customers' orders may not always be available. That is why customers evaluate it the worst among four items of information quality.

Inferential Statistics

Analysis of Mean Differences among Groups

In general, sixty six (66) respondents (73%) are satisfied or totally satisfied with logistics services. Figure 5 shows the mean scores of overall satisfaction with logistics services for joint-stock companies, state-owned companies and FDI companies, with the highest satisfaction for FDI companies (4.19 for FDI companies, 4.13 for state-owned companies and 3.8 for joint- stock company). The higher score for state-owned companies than that of joint-stock ones implies a certain problem for non-state logistics companies, which requires investigation.

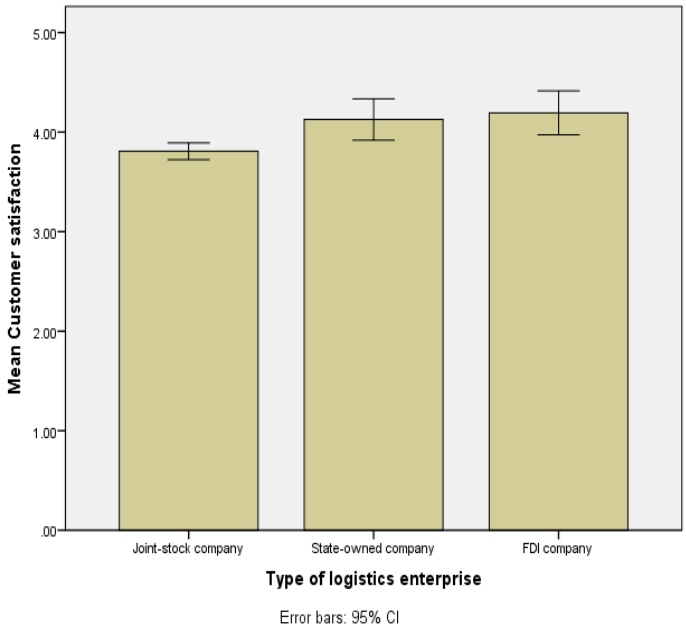

Figure 5 – Satisfaction differences towards each type of enterprise

ANOVA (analysis of variance) technique is used to analyze the significance of the difference in satisfaction mean among three types of enterprises. The statistics in Table 3 show that logistics services provided by joint-stock companies are less satisfactory than those by state-owned and FDI companies in the sense of statistical significance ($p = 0.002 < 0.05$ and $p = 0.004 < 0.05$). However, the difference in mean score on satisfaction between FDI and state-owned groups is not statistically significant ($p = 0.874 > 0.05$).

Table 3 – Comparisons among types of enterprises

Dependent Variable: Customer satisfaction

Tukey HSD

(I) Type of logistics enterprise	(J) Type of logistics enterprise	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Joint-stock company	State-owned company	-.31962*	.09907	.004	-.5534	-.0859
	FDI company	-.38619*	.11204	.002	-.6505	-.1218
State-owned company	Joint-stock company	.31962*	.09907	.004	.0859	.5534
	FDI company	-.06656	.13476	.874	-.3845	.2514
FDI company	Joint-stock company	.38619*	.11204	.002	.1218	.6505
	State-owned company	.06656	.13476	.874	-.2514	.3845

*. The mean difference is significant at the 0.05 level.

Mediation Analysis

The correlation coefficients between the loyalty and the independent variables, except for "type of customer", are positive and statistically significant at $p < 0.01$, indicating that the loyalty is positively associated with types of service use, information quality and customer satisfaction (Table 4).

Table 4 – Means, Standard Deviations and Correlations of Variables

	M	*SD*	*1*	*2*	*3*	*4*	*5*
1. Type of customer	1.4581	.72366	1				
2. Time of service using	2.5859	1.01553	.469**	1			
3. Information Quality	3.8443	.67491	.016	.170*	1		
4. Customer satisfaction	3.9192	.58985	.030	.126	.686**	1	
5. Loyalty	4.4383	.73061	.094	.174**	.519**	.733**	1
Note: n = 227, *p < 0.05, **p < 0.01							

The hierarchical regression method is used for mediation analysis (Table 5). The table shows the results of regression with the control variables (type of customer, time of service use) entered in Model 1 and the independent variables (information quality, customer satisfaction) entered step by step in Model 2 and 3. The results in the table show that the control variable (i.e. type of customers) has nothing to do with customer loyalty. It rejects the notion that business customers tend to be loyal to a service provider. However, the "time of service use" is positively related to customer loyalty. A familiar customer tends to be affiliated with a provider.

Table 5 – Results of Hierarchical Regression Analysis for Customer Loyalty

	Model 1	Model 2	Model 3
Control variables			
• Type of customer	.016	.058	.045
• Time of service using	.167*	.061	.060
Independent variables			
• Information Quality		.508**	.022
• Customer satisfaction			.709**
R^2	0.031	0.279	0.545
R^2 *change*		0.249	0.266

Dependent variable: loyalty (Note: *p < 0.05; ** p < 0.01)

The results of Model 2 supported the hypothesis H1 – Information Quality is positively associated with loyalty ($p < 0.01$) and the hypothesis H2 – Customer satisfaction is positively associated with loyalty ($p < 0.01$). Next, the independent variable (information quality) is significantly related to the mediator (customer satisfaction), which is found in Table 4. Then, when the independent variable (information quality) and the mediator (customer satisfaction) are simultaneously entered, the direct relationship between the independent variable (information quality) and the dependent variable (loyalty) significantly decreases. Because all the three conditions are met, it can be draw that the hypothesis H3 - Customer satisfaction mediates the

relationship between the information quality and loyalty is supported. Also, the results of Model 3 show that when the independent variable and the mediating variable are included in the model, the relationship between the information quality and loyalty becomes insignificant and the value of R^2 in the Model 3 is the highest, meaning that among the three models, the model 3 is the best fit. It implies how information quality leads to customer loyalty.

CONCLUSION

The regression results show the role of information quality, improved by information technology, in satisfying customers and keeping them loyal to logistics services. The mediation analysis further indicates the importance of customer satisfaction as it bridges the relationship between information quality and loyalty. In other words, information quality itself cannot create loyalty directly but can do so indirectly through satisfying customers. These findings are significant in consolidating the justifications for advanced information systems or applications in logistics service. Conventionally, capital investments in information technology are justified to serve strategic objectives of a company: to support corporate strategy, competitive performance objectives, long-term costs and benefits (Gunasekaran, Love, Rahimi & Miele, 2001). While the traditional top-down strategic consideration is for the long run, customer satisfaction would justify information technology investment in the sense of immediate economic returns, as loyal customers would at least sustain sales revenue. Nevertheless, to satisfy logistics customers for their loyalty is not easy for Vietnam's domestic logistics providers. Logistics customers, especially foreign customers, have stringent requirements or mandate for services. Logistics providers must comply with their high standards on order handling quality (e.g. order accuracy, cycle time) as well as a full-service function for all supply chain processes. Currently, domestic logistics companies provide fragmented services, meaning that some companies provide warehousing service without distribution, trucking companies do not operate warehousing services, and shippers do not have logistics capability for warehousing. Pioneers in providing full-service or total logistics services at high quality will be awarded with logistics contracts. This is an important success factor for increasing its revenues.

As a limitation, the regression model with customer satisfaction is not hypothesized to include predictors aside from information quality such as customer focus factor (e.g. service attitude, servers' knowledge), order focus (e.g. order accuracy, timeliness). For example, customer service requires human contact, the quality of which would have a voice in how well customers evaluate the services. Further studies should figure out whether there are covariance between these uncovered factors and information quality and how all of these factors impact the overall satisfaction.

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