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IMPLICATIONS OF LOGISTIC SERVICE QUALITY ON THE SATISFACTION LEVEL AND RETENTION RATE OF AN E-COMMERCE RETAILER’S CUSTOMERS

***Abstract.** The article emphasizes the results of an empirical exploratory research which is focused on the identification of the degree in which the dimensions related to logistic service quality (operational and relational) influence the customers’ level of satisfaction and their retention rate within an online retailer, specialized in sales of IT and electronic devices. The data collected from a representative sample of 100 customers were analyzed by means of confirmatory factorial analysis, one-way and two-way ANOVA method and linear regression analyses. The results outline the fact that the relational dimension of the logistic service quality represents the most relevant predictor both of the e-shop customers’ satisfaction level and retention rate. In this way, the retailer’s manager will be able to correlate in an optimal manner the strategies oriented towards acquisition of new clients and retention of existing ones with the perceived value of the logistic service quality.*

***Keywords:** logistic service quality, customer satisfaction, customer retention, e-shop, online retailing*

JEL Classification: L81, M15

1. Introduction

Maintaining a competitive advantage in the context of an aggressive competition on the online retailing markets involves the integration of the marketing strategy in the Supply Chain Management and the reinforcement of the role played by logistic service quality (LSQ) in the achievement of an efficient customer response.

Online retailers are constrained to adopt a customized approach of the customers’ needs by means of the logistic services, which provides the increase of the value-added in building long term relationships. Several factors contribute to a positive experience related to an online acquisition from an e-shop: comfort,

products' availability and diversity, handling and payment conditions, reimbursement policies in case of non-conformity (Ramanathan, 2010).

The main goal of the exploratory research that we undertook within an online retailer which provides IT and electronic devices was focused on the identification of logistic service quality contribution to the increase of its customers' satisfaction level and retention rate.

The analysis dimensions associated to the logistic service quality (LSQ) are the following:

- **Operational LSQ**, defined by means of physical features of the logistic services and the retailer's ability to provide the products and the services according to the customers' needs;
- **Relational LSQ**, defined by the retailer's ability to understand and to respond in a proactive manner to the customers' exigencies; this dimension is focused on customers' trust and confidence in the retailer's brand.

Logistic service quality concept was promoted by Mentzer (2001), which emphasized the fact that the customers perception on LSQ is not only oriented towards the physical distribution, being especially related to the after-sales process. According to the opinions of the specialists (Mentzer et al., 2001, Rafiq and Jafar, 2007), LSQ is determined by the following factors: customers' perception of the after-sales services, quality and relevance of information provided by sales and customer care representatives, order and delivery procedures.

Bienstock et al. (2008) proposes a modified version of the LSQ pattern, taking into consideration the elements which assure the logistic processes quality (procedures, information, after-sales communication), on the one hand, and the elements which provide logistic service accuracy, on the other hand.

Gil-Saura et al. (2011) considers that a scale that measures LSQ must be focused on information regarding the customers' perception on the operational side of the ordering and delivery processes.

Recent studies in LSQ field emphasize the fact that the personalized relationships among sales representatives and customers determine a favourable perception on the qualitative level of the logistic function (Vesel and Zakbar, 2010, Omar and Musa, 2011).

A study developed by Agatz et al. (2008) highlights the correlation between a retailer's logistic capability and its performances, revealed by financial indicators.

The option for e-commerce involves a logistic system tailored to the customers' requirements, reflecting the flexibility of the ordering system, speed of delivery and customization of products and services provided online (Mărunțelu, 2008).

The effective use of IT is critical to the success of an enterprise strategy, because it has the potential of being the major driver of economic wealth (Năstase et al., 2009). In order to support an online retailing strategy focused on building a favourable image, an e-shop must permanently look for solutions meant to improve LSQ, which will contribute to a higher customers' retention rate on long term (Huang et al., 2009).

2. Research methodology

The empirical study that we conducted was focused on the identification of the specific dimensions of logistic service quality (LSQ) that mainly contribute to the customers' satisfaction and loyalty. The data that we analyzed were collected from a survey that we undertook in a real e-commerce context – a retailer specialized in IT and electronic devices online sales. The sample was formed by 100 customers, which bought products from this e-shop website in the period July – December 2012 and accepted to answer to our questions. The sales representative of this e-shop facilitated us the feedback from the customers, by means of queries launched within the marketing database.

The questionnaire was structured on 12 items, which can be assessed by using a seven points Likert scale:

- **LSQ₁**: Within the website of this e-shop, the information about products' features is sufficient.
- **LSQ₂**: The products bought from the website didn't encounter problems.
- **LSQ₃**: The delivery of the products bought through the e-shop website respect the clauses stipulated in the online order.
- **LSQ₄**: Products received after online orders are undamaged.
- **LSQ₅**: Information available on products' optimal functioning is completely accurate.
- **LSQ₆**: The time between placing order and home delivery is relatively short.
- **LSQ₇**: The quality of the after-sales service is adequate according the customers' expectations.
- **LSQ₈**: In case of non-conforming products received by the customer, their return is accepted in order to be replaced.
- **LSQ₉**: The deliveries always respect the deadline mentioned in the online order.
- **LSQ₁₀**: Sales representatives of the e-shop are doing all their best in view to solve any unpredictable situation.
- **LSQ₁₁**: Sales representatives of the e-shop are able to find a solution to any request from the part of the customers.
- **LSQ₁₂**: Know-how and the experience of the e-shop sales representatives are adequate.

After the pretesting process, based on the study of communalities and weight of each factor from the analysis pattern, the scale was adjusted by eliminating three items from the initial questionnaire, whose communalities were inferior to 0.5 (LSQ₁, LSQ₅ and LSQ₆).

The results provided by the application of PCA (Principal Component Analysis) put in evidence the existence of a bi-dimensional structure al the assessment scale of LSQ (Table 1).

Table 1: The results provided by the application of PCA

(KMO: 0.847; determinant: 0.009; Barlett's test of sphericity (sig. level: 0.003)	LSQ analysis dimensions	
	Operational	Relational
LSQ ₂	0.490	0.385
LSQ ₃	0.762	0.194
LSQ ₄	0.711	0.343
LSQ ₇	0.768	0.178
LSQ ₈	0.724	0.338
LSQ ₉	0.743	0.261
LSQ ₁₀	0.207	0.886
LSQ ₁₁	0.283	0.842
LSQ ₁₂	0.325	0.851

After the initial exploratory phase, the results of PCA were processed during a confirmatory factor analysis (CFA), in order to validate the conceptual pattern related to our research. Thus, we remark the values corresponding to the indicators: CFI, NFI and IFI overcome the target of 0.9, which lead to the validity of our conceptual pattern. Moreover, RMSEA received a low level (0.0363).

The internal consistency of the measurement scale is confirmed, as the values assigned to Cronbach alpha coefficient for all the items are superior to the recommended level of 0.7. According to Fornell and Larcker criterion, the discriminant validity is also confirmed ($\rho_{vc} > (r_{ij}^2)$). All these statistical analyses lead to the confirmation of the convergent validity of the conceptual pattern (Table 2).

Table 2: Results of the confirmatory factor analysis, according to the report provided by SPSS software

Construct	Item	Squared multiple correlation	St. Loading factor (st. error)	Ratio critique	Cronbach's α $\alpha > 0.7$	Composite reliability $\rho(A) > 0.7$	Convergent validity $\rho_{vc} > 0.5$	Discriminant validity $\rho_{vc} > r_{ij}^2 (0.732)^2$
X ² /df= 65.610/26= 2.523; CFI= 0.991; NFI= 0.962 ; IFI= 0.995; RMR=0.061 ; RMSEA= 0.036								
Operational LSQ	LSQ9	0.501	0.708(0.128)	8.808	0.851	0.931	0.572	0.572>0.540
	LSQ8	0.658	0.677(0.134)	8.455				
	LSQ7	0.704	0.636(0.114)	8.012				
	LSQ4	0.573	0.757(0.102)	9.573				
	LSQ3	0.519	0.720(0.104)	8.976				
	LSQ2	0.695	0.704	-				
Relational LSQ	LSQ12	0.812	0.901(0.092)	14.522	0.880	0.887	0.732	0.732>0.540
	LSQ11	0.675	0.821(0.081)	13.149				
	LSQ10	0.674	0.821	-				

Independent variables are represented by the two dimensions of LSQ (relational and operational), while the **dependent variables** are represented by customers' satisfaction and their loyalty.

3. Results analysis

According to the one-way analysis of variance ANOVA (Table 3), the customers who bought products by means of the e-shop website perceived a high qualitative level of the logistic services.

Table 3: Perception of e-shop customers on LSQ, according to one-way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Operational LSQ	Between groups	21.015	1	21.015	23.378	0.000
	Within groups	177.985	198	0.899		
	Total	199.000	199			
Relational LSQ	Between groups	11.180	1	11.180	11.786	0.001
	Within groups	187.820	198	0.949		
	Total	199.000	199			

The results provided by two-way analysis of variance ANOVA emphasize the fact that the score related to the nine items overpass the value of 5. The highest score was assigned to the customers' perception on the item LSQ4 (Products received after online orders are undamaged) - 6.30, followed by the score assigned to the item LSQ9 (The deliveries always respect the deadline mentioned in the online order) - 5.82 and the score assigned to the item LSQ3 (The delivery of the products bought through the e-shop website respect the clauses stipulated in the online order) - 5.77. The highest score was assigned to the customers' perception on the item LSQ11 (Sales representatives of the e-shop are able to find a solution to any request from the part of the customers) - 5.28, respectively to the item LSQ10 (Sales representatives of the e-shop are doing all their best in view to solve any unpredictable situation) - 5.30 (Table 4).

Table 4: Results of the two-way ANOVA application

Items	Respondents (n=100)	F	Sig.
LSQ ₂	5.86	0.031	0.861
LSQ ₃	5.77	21.203	0.003
LSQ ₄	6.30	23.409	0.003
LSQ ₇	5.64	17.342	0.001

LSQ ₈	5.71	26.685	0.002
LSQ ₉	5.82	37.985	0.002
LSQ ₁₀	5.30	9.906	0.002
LSQ ₁₁	5.28	28.814	0.001
LSQ ₁₂	5.51	43.834	0.002

In order to identify the LSQ dimension which mostly contributes to the e-shop customers' satisfaction and loyalty, we conducted two linear regression analyses, in which the independent variables were represented by the two dimensions of LSQ (relational and operational), while the dependent variables were represented by customers' satisfaction and their loyalty.

Within the first linear regression analysis, in which the dependent variable was the customers' satisfaction (Table 5), the adjusted value related to R-square indicator was 0.790, revealing that the two LSQ dimensions generated a variance of 79% in the case of the variable – customers' satisfaction; the effects of these dimensions on the dependent analyzed variable are, in order of importance, the following:

- LSQ relational dimension ($\beta=0.617$);
- LSQ operational dimension ($\beta=0.572$).

Within the second linear regression analysis, in which the dependent variable was the customers' loyalty (Table 6), the adjusted value related to R-square indicator was 0.805, revealing that the two LSQ dimensions generated a variance of 80.5% in the case of the variable – customers' loyalty; the effects of these dimensions on the dependent analyzed variable are, in order of importance, the following:

- LSQ relational dimension ($\beta=0.635$);
- LSQ operational dimension ($\beta=0.564$).

Table 5: Results provided by the linear regression analysis, in which the dependent variable was the customers' satisfaction

	Unstandardized Coefficients	Standard error	Standardized coefficients	t	Sig
LSQ operational dimension	0.734	0.060	0.572	12.325	0.000
LSQ relational dimension	0.643	0.048	0.617	13.281	0.000

Note: The adjusted value of the indicator R-square=0.790; F=186.761; Sig. =0.000

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Table 6: Results provided by the linear regression analysis, in which the dependent variable was the customers' satisfaction

	Unstandardized Coefficients	Standard error	Standardized coefficients	t	Sig
LSQ operational dimension	0.713	0.056	0.564	12.635	0.000
LSQ relational dimension	0.652	0.046	0.635	14.225	0.000

Note: The adjusted value of the indicator R-square=0.805; F=205.838; Sig. =0.000

The results of the linear regression analyses prove that the most important predictor of both customers' levels of satisfaction and loyalty was represented by the relational dimension of logistic service quality.

4. Conclusions, managerial implications and future research agenda

In the context of hyper-competition within the IT and electronic devices online retailing market, which involves the implementation of competitive intelligence techniques, the logistic service quality can be considered as a critical success factor and a differentiation tool; the major challenge the online retailers face with is represented by the efficient response to the fast changes observed on the customers' behaviours. In this way, the online retailers' managers must be aware of the impact of the logistic service quality on their customers' satisfaction and retention rate, which supposes a customized customer relationship management approach.

The results of this research lead to a useful decision making support for the e-shop managers, in view to provide a framework related to the LSQ operational and relational dimensions' implications on the customers' acquisition and retention strategies.

The identification of the customers' exigencies and expectations in what concern the LSQ contribute to the focus on the logistic components which proactively influence the customers' online acquisition behaviour. According to the results, the customer relationships with after-sales representatives of the analyzed e-shop represent the most relevant predictor of their satisfaction and implicitly loyalty. We consider that the integration of the logistic service quality (operational and relational) within the communication strategy of the online retailer could determine the increase of its brand awareness and consequently, its business turnover.

The main future research that we will have in view is represented by the coordination of comparative studies concerning LSQ in different countries; such an initiative will involve the identification of researchers from other countries, interested in the development of an international collaborative research network; the main goal of the cross-cultural studies will be focused on the assessment of the

LSQ gaps perceived by customers which belong to different cultural and socio-economic backgrounds; in this way, we will be able to correlate the Hofstede's cultural dimensions with the two analysis dimensions of LSQ, in view to find out the most relevant predictors of customers' satisfaction and loyalty within a Supply Chain Management approach at the cross-cultural level.

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