A study on Logistics Service Quality in E-Retailing Amongst Online Shoppers in Kuala Lumpur

Magarajothi Revindran¹, Pavitra N.K. Ragen¹, and Bahri Mahmud¹*

¹Faculty of Business and Information Science, UCSI University, Jalan Menara Gading, 56000 Cheras, Kuala Lumpur, Malaysia

*Corresponding author’s e-mail: bahri@ucsiuniversity.edu.my

Abstract. Online shopping has made shopping more convenient since not only it saves time and cost, but it also gives consumers the opportunity to compare items/goods against other retailers through web-browsing. Nonetheless, there are many factors which influence the purchasing behaviour of consumers. In this study, four factors related to logistics service quality were examined in order to determine which factors impact online shoppers’ satisfaction. The four factors mentioned were timeliness, product availability, condition of the product and reverse logistics. Questionnaires related to this study were distributed to online shoppers around Kuala Lumpur area and 153 responses came back. These responses were analysed for reliability tests, Pearson Correlation Coefficient, and multiple regression analysis in SPSS software. The outcome of Cronbach’s alpha showed that the questions in the questionnaire are highly reliable. As for the correlation and regression analyses, there was a significant and positive relationship between timeliness, availability, condition and return logistics. In addition, availability had the highest correlation (r = 0.721) with online shopper’s satisfaction on the logistics service quality of the e-retailers.

1. INTRODUCTION

Online shopping is an action of purchasing or buying products or services by using internet. Online shopping grew rapidly over the past few years. Online shopper can easily buy selected product by doing some clicks from their home or work place. Online shoppers are not required to go to the trader’s place, since they do not have time limitation by the premise’s opening hours to force the online shopper to have intention of going to trade’s place for shopping.

Online shoppers demographically can be divided into age based, gender, occupational status, income status and country of residence. These aspects largely influence an online shopper’s decision to purchase things from online. Online shoppers tend to seek for convenience, variety, and they are not conscious about the online things’ brand and price [1]. Online shoppers are favour to direct marketing and advertising. Gender is the main factor in terms of what types of things they are interested in buying.

Online shoppers’ satisfaction is very important to the business owners and marketers which act as a metric to make improvements in their businesses. Logistics is a movement process of things from one point to another point to meet the online shopper’s requirements. Logistics process starts with the suppliers and the chain continues all the way up to handover the ordered item in the good quality at the right time and at the required place for a reasonable price with the right condition to the online shopper. According to the Wall Street Journal, majority numbers of online shoppers responded that free shipping had given a big impact in their ordering decisions. In general, logistics service quality plays
an important factor in online shoppers’ decision to determine the e-retailers. An online shoppers’ satisfaction can be ensured if the e-retailer is capable to ship the items ordered by the online shoppers in excellent item quality, to the right address, lower delivery time, and appropriate condition as well with excellent data [2]. In a survey conducted by JDA, 410 global retailer and online shopper goods CEOs, only 19% of the top 250 retailers have the ability to meet the online retailer’s demand [3].

Timeliness refers to goods that are ordered, arrived at the online shopper’s location as promised by the retailer. According to Yuan [4], timeliness can be a factor that influence sales, because no matter how good the quality of a product, the timeliness factor will determine the loyalty of online shoppers towards their company. Online shopper’s expectation of actual delivery is only a minimal dependent of their satisfaction. Online shoppers are increasingly and turning fast in social moves, slow response or ignoring online shoppers are very harmful and can hurt online shopper’s loyalty. Timeliness is very important to online shoppers these days, despite e-retailers offer their quality and relevance [5]. Timeliness of the delivery of products can be further improved by selecting the right suppliers, and constantly evaluating the efficiency of the suppliers through an efficient selection and evaluation process.

Availability of product gives big impact on online shoppers purchasing intention. When there are too much of competition on e-retailer for certain goods, online shoppers will look for availability of product from a different e-retailer and choose the best they wanted, hence it is proved that product availability plays a role to satisfy the online shopper [6]. The e-retailers are required to meet and always support the escalating assortment of goods that commonly includes fast and slow moving products. Therefore, many retailers are relying on third party logistics service providers (3PLs) that has the capability to deal with the dramatically increasing online requirements. The 3PLs are said to be hired by e-retailers at times for the processing of their orders instead of opting for in-house order processing. The rather advanced technology capability held by the 3PLs enables them to automate the order processing steps. The appropriate automation are said to be capable of minimizing manual touch which leads to more accurate orders. To back up the requirement of automation in the logistics aspect of the e-retailing, the automated solutions in the warehouse or distribution centre of the 3PLs are said to arrange and rearrange via unit sortation equipment that will in turn enable the 3PLs themselves to drill elements down to individual order level [7].

The unified order placements and tracking of packages is said to be possible with the warehouse management systems (WMS). The 3PLs’ WMS allows the e-retailers to possess precise order data flows from one end of their fulfilment chain to another end of their fulfilment chain. This efficient system functions as a core for all the order information of the e-retailers. Hence, this will help in preventing any errors in the online shoppers’ orders and also prevent any loss of orders. In order to have a progressive e-retailing picking, involves great automated robotic and shuttle related systems provide precise order fulfilment. With this system, the work levels of hundreds of order lines per hour with rigor accuracy [8]. The main objective of this study is to determine the components of logistics service quality (LSQ) that affects the online shopper satisfaction in an e-retailing environment as well as the relationship that exists between the components of logistics service quality (LSQ) and the online shoppers’ satisfaction.

2. METHODOLOGY

2.1. Research Design

For this research, quantitative methodology is used to evaluate the correlation between dependent variables (online shoppers satisfaction on the e-retailers’ logistics service quality) and also independent variables (timeliness, availability, condition and reverse logistics) which are said to be measured numerically and examined by utilizing descriptive and also inferential statistics. Quantitative approach is a measurement of behaviours and perceptions which includes survey method. Figure 1 shows the conceptual framework set for this study. Relationship H01, H02, H03 and H04 in the below figure illustrates that timeliness, availability, condition and reverse logistics has no influence on the
online shoppers satisfaction on the e-retailers’ logistics service quality. On the other hand, relationship Ha1, Ha2, Ha3 and Ha4 illustrates that the independent variables has positive significant impact on the dependent variable.

![Conceptual Framework](image)

**Figure 1. Conceptual Framework**

2.2. *Data Collection*
This study is based on primary data and secondary data as the method of data collection. This study used survey method through questionnaire adapted and distributed to a sample study. The data was collected by means of a questionnaire survey, distributed to online shoppers within the region of Kuala Lumpur. The secondary data is obtained from all the information bases that are prevailing inclusive of articles from various journals, online published books and websites.

2.3. *Population and Sampling Design*
The population size to analyse the online shoppers’ satisfaction on e-retailers’ logistics service quality is 7,254,000 which is the total population in entire Kuala Lumpur [9]. Non-probability sampling technique was used in this research. It is a sampling method whereby the individual chosen from the entire population is not identified. A total of 153 responses is used in this research to determine online shoppers satisfaction on the e-retailers’ logistics service quality.

2.4. *Data Analysis*
The software used for this analysis method is Statistical Package for Social Science (SPSS) software. SPSS software is a user-friendly and has ability to interface with many databases. The analysis comprised of Reliability Tests, Pearson Correlation Coefficient, and multiple Regression Analysis

3. **RESULT AND DISCUSSION**

3.1. *Validity Test*
Validity is defined as to what degree a test is said to determine or examine what is desired to be examined or determined [10-12]. This research involved the face validity as well as content validity. The face validity involved the process of consultations with the supervisors to evaluate and examine the questions that were included in the questionnaire. This face validity was done right before distributing the questionnaires to the fellow respondents. To obtain the face validity in this research, the title of this research was talked over and approved by the supervisor. Later, the questions in the questionnaire were modified to perfection and accuracy based on the accumulated opinion and criticism of the supervisor. Moreover, the content validity was presented in this research as the pilot
test that was carried out resulted in none of the respondents complaining about any sort errors in the questions in the questionnaires. This clearly indicated that the questions were easy to be understood and answered by all the fellow respondents. A total of 6 questions based on 5-point Likert scale was created in order examine each independent variable. In addition to this, a total of 7 questions were developed based on the 5-point Likert scale in order to examine the dependent variable. Hence, the score of the independent variables are said to range from the minimum of 6 to the maximum of 30. As for the dependent variable the score is said to range from the minimum of 6 to the maximum of 35.

3.2. Reliability Test

Reliability analysis is described as an analysis which identifies to what degree the questions in the questionnaire was error free and bias free [13-14]. Table 1 showed the Cronbach’s alpha for all the questions referring to the independent variable and the dependent variable in the questionnaire that was used in this research. There were a total of 45 questions that was prepared in the questionnaire. The value of the Cronbach’s Alpha for all the questions in the questionnaire is said to be 0.910 which indicated that the questions have very good reliability based on the rule of thumb of Cronbach’s Alpha. There was consistency among the questions in the questionnaire and can be concluded that this model is reliable and fit for this research.

| Cronbach's Alpha | N of Items |
|------------------|------------|
| 0.910            | 45         |

Table 1. The value of Cronbach’s alpha for the overall items.

Table 2 indicated the Cronbach’s Alpha and the number of questions for each independent variable and dependent variable. The Cronbach’s Alpha value for Timeliness is said to be 0.806. Therefore, the reliability and consistency of all the 6 items or questions of the Timeliness variable was good because alpha value is ranged between 0.8 and 0.9. Moreover, the Cronbach’s Alpha for Availability is said to be 0.809. Hence, all the 6 items or questions belonging to the Availability variable is said to have a rather good reliability and consistency as the alpha is ranged between 0.8 and 0.9. The Cronbach’s Alpha for Condition was 0.662. Thus the reliability and consistency of all the 6 items or questions referring to the Condition was acceptable as the alpha is ranged from 0.6 to 0.7. In addition to this, the Cronbach’s alpha value for Return Logistics was 0.781. Therefore the reliability and consistency of all the 6 items or questions referring to the Return Logistics is regarded as acceptable. This is again because the alpha value is in between the range of 0.7 and 0.8.

| Variables            | Cronbach's Alpha | N of Items |
|----------------------|------------------|------------|
| Independent Variables|                  |            |
| Timeliness           | 0.806            | 6          |
| Availability         | 0.809            | 6          |
| Condition            | 0.662            | 6          |
| Return Logistics     | 0.781            | 6          |
| Dependent Variable   |                  |            |
| Online Shoppers' Satisfaction On The Logistics Service Quality Of The E-Retailer | 0.858 | 7 |

Lastly, the Cronbach’s alpha value for the Online Shoppers’ Satisfaction on the Logistics Service Quality of the E-Retailer was 0.858. Hence, all the 7 items or questions referring to the Online Shoppers' Satisfaction On The Logistics Service Quality Of The E-Retailer is regarded as acceptable. This is because the alpha value is ranged between 0.8 and 0.9. It also had the highest Cronbach’s alpha value compared to all other independent variables. It is understood that all the independent variables namely the Timeliness, Availability, Condition, Return Logistics and the dependent variable were reliable and consistent as well as was able to measure everything that was needed to be examine by the researcher. The overall reliability of the questions in the questionnaire is said to be excellent.
3.3. Pearson Correlation Coefficient

The main aim of conducting the Pearson Correlation Coefficient is to study the course of the relationship that lies between each independent variables and dependent variable. In this Correlation analysis, \( r \) is the coefficient which is examined based on the sample data. The \( p \) however represents the population coefficient [10]. The value of \( r \) (coefficient of correlation) is only allowed to fluctuate between +1 and -1. +1 indicates that there is positive correlation between the dependent variable and the independent variable. However -1 indicates that there is negative correlation between dependent variable and the independent variable.

It can be seen that there is positive relationship between the timeliness and online shoppers’ satisfaction on the logistics service quality of the e-retailers because the value of coefficient correlation \( r \) was + 0.551 as shown in Table 3. Since \( r \) falls in the range of 0.41-0.70, hence this specified that the relationship between timeliness and online shoppers’ satisfaction on the logistics service quality of the e-retailers is rather moderate based on the Guilford’s rule of thumb table.

Moreover, there is positive relationship between the availability and the online shoppers’ satisfaction on the logistics service quality of the e-retailers. The value of coefficient of correlation was 0.721. Strong relationship between the availability and online shoppers’ satisfaction on the logistics service quality of the e-retailers was observed as the \( r \) value is within range of 0.71-0.90.

In addition, there is also positive relationship between the condition and the online shoppers’ satisfaction on the logistics service quality of the e-retailers as the value of \( r \) was 0.404. Since \( r \) value in the range of 0.21-0.40, hence this stated that the relationship between condition and also online shoppers’ satisfaction on the logistics service quality of the e-retailers is rather weak based on Guilford’s rule of thumb table.

Table 3. Summary of the results of the Pearson Correlation Coefficient Analysis

| Correlations | Timeliness | Availability | Condition | Return Logistics | Online Shopper's Satisfaction on Logistics Service Quality of the E-retailers |
|--------------|------------|--------------|-----------|------------------|--------------------------------------------------------------------------------|
| **Timeliness** | Pearson Correlation | 1 | .606* | .261 | .458** | .551** |
| * Sig. (2-tailed) | 153 | 153 | 153 | 153 | 153 |
| **Availability** | Pearson Correlation | .606* | 1 | .353* | .577* | .721* |
| * Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 |
| * N | 153 | 153 | 153 | 153 | 153 |
| **Condition** | Pearson Correlation | .261* | .353* | 1 | .377* | .404* |
| * Sig. (2-tailed) | .001 | .000 | .000 | .000 | .000 |
| * N | 153 | 153 | 153 | 153 | 153 |
| **Return Logistics** | Pearson Correlation | .458* | .577* | .377* | 1 | .606** |
| * Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 |
| * N | 153 | 153 | 153 | 153 | 153 |
| **Online Shopper's Satisfaction on Logistics Service Quality of the E-retailers** | Pearson Correlation | .551* | .721* | .404* | .606* | 1 |
| * Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 |
| * N | 153 | 153 | 153 | 153 | 153 |

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

Based on Table 3, there existed a positive relationship between the return logistics and the online shoppers’ satisfaction on the logistics service quality of the e-retailers as the value of \( r \) is 0.606. Thus, the relationship between the return logistics and online shoppers’ satisfaction on the logistics service quality of the e-retailers is rather moderate based on Guilford’s rule of thumb table.

In a nutshell, availability had the most significant and strong relationship with the online shoppers’ satisfaction on the logistics service quality of the e-retailers. Whereas, timeliness and return logistics had only moderate relationship with the online shoppers’ satisfaction on the logistics service quality of
the e-retailers. Condition has the weakest relationship with online shoppers’ satisfaction on the logistics service quality of the e-retailers. It is therefore obvious that among all the independent variables, availability was the most paramount and essential variable that would impacts the online shoppers’ satisfaction on the logistics service quality of the e-retailers.

3.4. **Multiple Regression Analysis**

Multiple regression analysis is a type of analysis technique in which more than one independent variable is examined in order to predict the dependent variable. Multiple regressions is very useful to help researcher identify the factors that predict the dependent variable, in what way each of the independent variable influences the dependent variable as well to what extent each independent variable influences the dependent variable.

Table 4 showed the correlation which in this case represented by R, indicated the values of the multiple correlation coefficient between all the independent variable and the dependent variable. The level of the correlation (R) between all the four independent variable in this research is tabulated in the table 4. The value of R square indicated the percentage of variance in the dependent variable which can be explained by the independent variable. For the timeliness variable, the value of the R square was 0.304. This meant that the timeliness accounted for 30.4% of variation in the Online Shopper’s satisfaction on the Logistics Service Quality of E-retailers. Furthermore, for the availability variable, the value of the R square was 0.519 which implied that the availability accounted for 51.9% of variation in the Online Shopper’s satisfaction on the Logistics Service Quality of E-retailers. Moreover, for the condition variable, the value of the adjusted R square was 0.163. This pointed out that the condition accounted for 16.3% of variation in the Online Shopper’s satisfaction on the Logistics Service Quality of E-retailers. In addition, the return logistics variable, the value of the adjusted R square was 0.367. This meant that the return logistics accounted for 36.7% of variation in the Online Shopper’s satisfaction on the Logistics Service Quality of E-retailers.

Table 4. Summary of Regression Analysis of Respondents

| Independent Variables | R    | R Square | Adjusted R Square | Std. Error of the Estimate |
|-----------------------|------|----------|-------------------|---------------------------|
| Timeliness            | 0.551| 0.304    | 0.299             | 3.0225                    |
| Availability          | 0.721| 0.519    | 0.516             | 2.511                     |
| Condition             | 0.404| 0.163    | 0.158             | 3.314                     |
| Return Logistics      | 0.606| 0.367    | 0.363             | 2.881                     |

3.5. **Overall Discussion**

The timeliness which was one of the four identified logistics service quality components had moderate relationship with the online shoppers’ satisfaction. The multiple regression analysis indicated that the significant value (sig=0.000) was less than 0.05. This showed that the respondents agreed that timeliness could affect their satisfaction on the logistics service quality of the e-retailers as online shoppers. From the Pearson Correlation Coefficient, the respondents believed that there is only moderate relationship (r = 0.551) with their satisfaction on the logistics service quality of the e-retailers as online shoppers. For many, customers timeliness of delivering products is very interrelated with their satisfaction level on e-retailing.

The multiple regression analysis for availability factor indicated that the significant value (sig=0.000) was less than 0.05. This showed that the respondents agreed that availability could affect their satisfaction on the logistics service quality of the e-retailers as online shoppers. From the Pearson Correlation Coefficient, the respondents believed that there is a strong relationship (r = 0.721) with their satisfaction on the logistics service quality of the e-retailers as online shoppers. This confirmed that customers chose the product to be available all the time to avoid delays. So, if a customer could not find the desire products in one online retailer’s website, they still can seek for other options.

The condition was one of the four identified logistics service quality components that had a relationship with the online shoppers’ satisfaction. The multiple regression analysis indicated that the
significant value (sig=0.000) was less than 0.05. This showed that the respondents agreed that condition could affect their satisfaction on the logistics service quality of the e-retailers as online shoppers. From the Pearson Correlation Coefficient, the respondents believed that there was a rather weak relationship (r = 0.404) with their satisfaction on the logistics service quality of the e-retailers as online shoppers. Conditions is said to influence the least in achieving the online shopper’s satisfaction on the logistics service quality of e-retailers.

The return logistics was identified to have a relationship with the online shoppers’ satisfaction. The multiple regression analysis indicated that the significant value (sig=0.000) was less than 0.05. This showed that the respondents agreed that return logistics could affect their satisfaction on the logistics service quality of the e-retailers as online shoppers. Whereas the Pearson Correlation Coefficient, concluded that the respondents believed that there is only moderate relationship (r = 0.606) with their satisfaction on the logistics service quality of the e-retailers as online shoppers. To make it simple for customers to return the goods to e-retailer whenever they receive damaged goods, this will increase the chances of customers coming back and buying again.

4. CONCLUSION
In conclusion, the research results showed significant and positive relationship between timeliness, availability, condition and return logistics. In terms of the strength of relationship between the dependent variable and independent variables, availability showed the highest correlation with online shopper’s satisfaction on the logistics service quality of the e-retailers, followed by return logistics, timeliness and condition. In order to increase their sales levels, the study recommends e-retailers to focus more on conditions of goods or the terms of conditions. This helps the e-retailers to create certainly as an agreement to their customers that the goods they are about to send customer’s goods in good conditions. Overall, the findings of this study are consistent with those of prior studies.

References
[1] Wahab, S.N., Lay, Y.F., Koay, W.L., & Hussin, A.A.A, (2019). Usage of Pedestrian Bridge among the Urban Commuters in Kuala Lumpur. International Journal of Operational Research, DOI: 10.1504/IJOR.2021.10019276.
[2] Rym Bouzaabia, O. B. 2013. Retail logistics service quality: a cross-cultural survey on customer perceptions. International Journal of Retail & Distribution Management, Vol. 41 Issue: 8, pp.627-647.
[3] JDA, Customer Pulse Report 2015.
[4] Yuan Xing, D. B. 2011. The interface between retailers and logistics service providers inthe online market. Physical Distribution service quality in online retailing, 415-432.
[5] Teresa, G., & Evangelos, G. 2015, May. Importance of logistics services attributes influencing customer satisfaction. In 2015 4th International Conference on Advanced Logistics and Transport (ICALT) (pp. 53-58). IEEE.
[6] Selvachandran, G. & Peng, X.D. 2018. A modified TOPSIS method based on vague parameterized vague soft sets and its application to supplier selection problems. Neural Computing and Applications, pp. 1-16. DOI: https://doi.org/10.1007/s00521-018-3409-1.
[7] Selvachandran, G., Quek S.G., Smarandache, F. & Broumi, S. 2018. An extended technique for order preference by similarity to an ideal solution (TOPSIS) with maximizing deviation method based on integrated weight measure for single-valued neutrosophic sets. Symmetry, Vol. 10, pp. 236-252. DOI: 10.3390/sym10070236.
[8] Christopher, T.C & Julie, H.M 2010. Effect of Product Availability: Experimental Evidence. National Bureau of Economic Research, pp 4-6. Retrieved from http://www.nber.org/papers/w16506.pdf
[9] McCrea, B. (2016, January 1). Modern Materials Handling. Retrieved from Retail and e-commerce operations chase accuracy and flexibility: http://www.mmh.com/article/retail_and_e_commerce_operations_chase_accuracy_and_flexi
bility
[10] Graves, J. B. 2013, January 07. *inbound Logistics*. Retrieved from Maximizing Productivity in E-commerce Warehousing and Distribution Operations:
[11] Wahab, S.N., & Khong W.L. (2018). Multiple Linear Regression Modelling of Parcels’ Distribution Design Factors and online Shopping Customer Satisfaction. *International Journal of Modelling in Operations Management*, 7(2), 95-110.
[12] Donald R. Cooper, P. S. 2014. *businessresearchmethods*. New York, NY: McGraw-Hill/Irwin.
[13] Wahab, S.N, Olugu, E.U., Lee, W.C., & Tan, S.Y. (2018). Big data analytics adoption in Malaysia warehousing industry. *The 32nd International Business Information Management Association Conference, IBIMA 2018*, 2349-2365, 15-16 November, Seville Spain.
[14] Teo, A.C., Tan, G.W.H., Ooi, K.B, Hew, T.S and Yew, K.T. 2015 'The Effects of Convenience and Speed in M-Payment Usage', *Industrial Management and Data Systems*, Vol. 115 No. 2, 311-331
[15] Sham, R., Wahab, S.N., Anuar, M.M., Tong, W.H. & Yap, J.T. (2019). Safety Indicator for Taxi Users in Urban Area. *International Journal of Supply Chain Management*, 8(2), 1035-1041.
[16] Rajendran, S.D., Wahab, S.N, Ling, Y.W., and Yun, L.S. (2018). The Impact of Logistics Services On the E-Shoppers’ Satisfaction, *International Journal of Supply Chain Management*, 7(5), 461-469.