

Last- Mile Logistics Concepts Intensify The E-Commerce Growth Among The Consumer In Perak, Malaysia

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Abstract— The purpose of this paper is to examine the consumer's satisfaction towards the last mile logistics (LML) in e-commerce business. In LML, consumer satisfaction is the main concern and it is influenced by variety of factors which include reliability, flexibility, consumer attitude and technology. A systematic literature review being examine the interface between e-commerce and last mile logistics. Followed by a quantitative analysis methodology to understand the significant status of variables where ta survey being conducted within a discipline manner. The findings are supported with a literature analysis conceptualizes between a set of variables. The authors propose that the future research should be focused on the economic growth of e-commerce and last mile logistics in Malaysia. To circumvent the restraint of this research, the authors expand the examining of research to derive the states of consumers. The framework of this research specifies the insights of last mile logistics service that supports the complete e-commerce accomplishment. Improved consumer satisfaction would have a positive impact in term of last mile logistics services and e-commerce. Lastly, this paper comprehensively reviews on LML, which is very essential to fulfill consumer requirements to adapt the e-commerce trend.

Keywords— Last-mile logistics, e-commerce, consumer satisfaction, reliability.

I. INTRODUCTION

In 1991, the rapid surge of internet has integrated business to be conducted through e-commerce or online shopping (Tseng, Lee and Chu, 2015). The ongoing success of e-commerce or online shopping in the modern era has promoted business models comprising door-to-door delivery when supply chain management was introduced. Online shopping businesses tend to compete against each other regarding price and service quality (Ehmke and Mattfeld, 2012). Most products purchased online ultimately must be transported to the end user by road. The successful of e-shopping is contributed by the final delivery services (Ehmke and Mattfeld, 2012). The delivery system must be efficient and reliable to gain consumer loyalty and thereby, increase business performance. Last-mile logistics (LML) refers to the last part of a delivery process from a distribution center (DC) or warehouse to the end user (Stanley and Jagjit, 2015). In the supply chain process, last-mile is known as the most costly and inefficient process. (Gevaers, Voorde & Vanelander, 2014). Besides, another view from Harrington et al. (2016) also stated the most expensive segment in supply chain are last-mile. Unfortunately, last-mile delivery in Malaysia remain some obstacles in achieving consumer satisfaction due to various factors which are reliability, flexibility, consumer attitude and technology. According to KPMG (2017), the growth of online sales in Malaysia has increased every year since the increase popularity of e-commerce. The increases of final delivery process using road transport have serious impact on the environment and caused traffic congestion in many urban areas

(Jean-Paul Rodrigue, 2017). Specifically, it is posited the factors influences performance through logistics capability of LML process. The purpose of our research is to provide a theory-based explanation to clarify the role of LML and propose a conceptual framework that explicates the relationship between the influencing factors on LML, with logistics capability and performance, and consumer perception toward LML. Consumers are demanding for fast, agile same-day delivery, which caused a shift of delivery services closer to the end consumers. When dealing with home delivery, the last-mile have a crucial service quality problem which is poor fulfillment experience. The delivery process is still largely inconvenient for consumers, with deliveries typically made only during office hours when many consumers may not be at home. Besides, LML also encountered problem of lack of critical mass in specific region, due to an inadequate market density penetration which have caused dissatisfaction held on the consumers due to the delay of last-mile (Gevaers et al., 2011). Without a certain quality of service, the travel time may increase and this may affect the consumers' perception towards online shopping. Limited connectivity and accessibility of road facilities and poor coordination between different intermodal planning could affect last-mile delivery performance. If there are road congestion during peak seasonal demand, it will affect last-mile productivity. This may reduce their intention to adopt LML. The aim of this research is to understand the bottlenecks arises during the delivery services and explore the behavioural towards the online shopping.

II. LITERATURE REVIEW

Consumers or customers, are always looking towards engaging with businesses that are able to provide them with a comfortable amount of satisfaction. Consumer satisfaction is the way consumers measure or evaluate the total services provided by the business towards meeting their needs. (Liliana, 2014). One of the key elements that enhances customer satisfaction is reliability. Reliability is not something that can be easily achieved by all businesses. A reliable business will provide the same quality service over and over, no matter how many times you will need to do it for your customers. (Naim 2014). If a business fails to provide reliable service, their customers would never be satisfied with them.

H₁ There is a significant relationship between reliability and consumer satisfaction on last-mile delivery

Business operations can be a bit unpredictable at times as customers have the tendency to make changes regarding shipment and delivery at the very last moment but still expect their logistics providers to accommodate their request (Xu, Jiang and Li, 2013). A lot of procedures would have to be done before these changes can be accommodated. However, customers are looking forward for their solutions provider to grant them the flexibility to accommodate their request and also not being put through list of procedures(reference). Consumers are looking forward to this type of flexibility. Flexibility in running businesses operations is another element that helps to improve customer satisfaction levels towards last mile delivery. The flexibility of accommodating last minute changes and still delivering the goods without any delay will certainly help boost customer satisfaction. Therefore, Flexibility does have an impact towards customer satisfaction in last mile delivery.

H₂ There is a significant relationship between flexibility and consumer satisfaction on last-mile delivery

Consumer attitude explains the entire functions of selecting goods and services by a consumer. Consumer attitude also reflects on the consumers preference, habit and intention when it comes to buying goods and services (Cronin, 2000). Customers are now

moving towards the online platforms to seek better benefits price discounts , convenience of shopping and free shipping. This factors will definitely help motivate the consumer to change their attitudes towards utilizing last mile delivery (Nabot et al, 2014). Kuster et al (2016) has proven that consumers attitude does indeed have a positive relationship towards product or service like the last mile delivery market. Guarerro(2014) has stressed that it is very important for a business to meet the expetations of their customers since they are the most important step in LML.

H₃ There is a significant relationship between consumer attitude and consumer satisfaction on last-mile delivery

Technology is a primary tool that enhances the competitiveness in logistics and its performance. It also improvise the overall efficiency and effectiveness of the supply chain system. (David Upton, 2014). Tracking Technology is very much needed to make the last-mile delivery leaner, agile and effective when it comes to achieving consumer satisfaction (Bettley et al., 2005). Shamsuzzoha and Helo (2011), have identified in their research that a tracking system would be able to act as the focal point of strengthening the logistics role in the market by means of improved consumers' satisfaction by providing high visibility. The concept of last-mile visibility has been utilized by tracking technology to fulfill the consumer satisfaction and LML performance (Jones and Chung, 2016). According to David Upton (2014), by combining tracking technology and proactive consumer attitude it would be able to improve the success rate of first time delivery. Tracking technology certainly helps to reduce uncertainties arising from delivery and allows consumers to view the status of delivery process (Nguyen, Leeuw and Dullaert, 2016). Tracking system is considered to be an extremely useful service in the e-commerce and logistics sectors as it can improve the satisfaction of consumers and attract more usage of e-commerce which also increase the usage of last-mile delivery.

H₄ There is a significant relationship between technology and consumer satisfaction on last-mile delivery

III. METHODOLOGY

The target population of the research will be the consumers in Perak state. There are only 13.4% using e-commerce in Perak. This shows that the state is still in the early adoption of e-commerce. The population of Perak is 2.49 million and based on Bougie and Sekaran(2016), the sample size that we need to use to conduct our research will be 384. We used convenience sampling to distribute 400 sets of questionnaires to the respondents in Perak area at various places. In this research, Pearson correlation coefficient analysis and Multiple linear regression analysis will be used to analyze the data with the help of SPSS software.

IV. FINDINGS

A. *The Analysis for Pearson's Correlations for Independent variables and Dependent*

Constructs		constructs			
	Reliability	Flexibility	Consumer Attitude	Technology	Consumer Satisfaction
Reliability	1	.490**	.423**	.512**	.498**
Flexibility	.490**	1	.210**	.226**	.330**
Consumer Attitude	.423**	.210**	1	.427**	.384**
Technology	.512**	.226**	.427**	1	.604**
Consumer Satisfaction	.498**	.330**	.384**	.604**	1

TABLE 1, ** P>0.05

Based on the table (I) above, all the independent variables have obtained Pearson correlation coefficient p-value of 0.000 which shows that there is a relationship between the independent variables with consumer satisfaction at 0.05 significant level.

Model					
	R	R ²	Adjusted R Square	Std. Error of the Est	Durbin-Watson
1	.658 ^a	.433	.427	.47425	1.846

TABLE II

a. Predictors: (Constant), Technology, Flexibility, Consumer Attitude, Reliability

b. Dependent Variable: Consumer Satisfaction

The value of Adjusted R square in this research is 0.427 which means that the adjusted independent variables can explain 42.7% of the dependent variable variation. Although the value of adjusted R square was not very high, but we can conclude it as acceptable when the research involves human behavior. It is expected to be lower than 50% as predict human and their desires are difficult.

V. DISCUSSION

The first hypothesis indicates a weak positive relationship between reliability and consumer satisfaction with a Pearson correlation value $r=0.498$ and the 2 tailed p-value of correlation less than 0.05. Moreover, with a p-value of the coefficient that is equal to 0.001 in the multiple regression analysis is also below 0.05. This indicates a significant relationship and variable reliability plays the second important role in last-mile delivery in Perak.

Furthermore, the second hypothesis which has a weak positive relationship between flexibility and consumer satisfaction has a

Pearson correlation value $r=0.330$ and the 2 tailed p-value which is below 0.05. Moreover, the p-value for the coefficient is equal to 0.004 in the multiple regression analysis which is < 0.05 . Hence, the independent variable flexibility has significantly contributed towards consumer satisfaction for last-mile delivery in Perak.

The third hypothesis indicates a weak positive relationship between consumer attitude and consumer satisfaction. With a Pearson correlation value $r=0.384$ and the 2 tailed p-value of correlation < 0.05 . The p-value for the coefficient is equal to 0.029 in the multiple regression analysis which is < 0.05 . The independent variable attitude has significantly contributed towards consumer satisfaction for last-mile delivery in Perak.

The fourth hypothesis has the Pearson correlation value $r=0.604$ and the 2 tailed p-value of correlation < 0.05 . This is a clear indication of a moderate positive relationship between technology and consumer satisfaction. With a p-value for the coefficient is equal to 0.000 in the multiple regression analysis which is also less than 0.05. The independent variable is significant for this paper and it plays an important contribution towards consumer satisfaction for last-mile delivery in Perak. In short, the independent variable technology plays a pivotal part in ensuring consumers satisfaction when purchasing via online and uses the final delivery.

VI. CONCLUSION & RECOMMENDATIONS

This paper aims to ascertain the factors that increase consumer's satisfaction towards last-mile delivery. The findings have indicated that reliability, flexibility, consumer attitude and technology play a significant role in consumer's satisfaction. Based on the result of this paper, technology plays a pivotal role in increasing consumer's satisfaction towards last-mile delivery. By incorporating technology into delivery services customers are more independent and can alleviate their concerns the ware bouts of their parcels. This statement is supported by Imran et al., (2019) that the use of technology in logistics increases customer's usage of delivery service. On the long run, customers have a higher level of satisfaction based on the quality of technology used by the logistic provider and are perceived as an added advantage for the customer. In this paper, we also found that reliability is the second most significant factor to consumer's satisfaction towards last-mile delivery. The ability of the logistics provider to deliver as promised is crucial in ensuring the logistics provider is reliable. Moreover, customers have high expectations for their parcels to be delivered by a reliable logistics provider which maintains timely delivery service and at the same time safeguards the parcels. This statement is supported by Muhammad and Permana, (2019) where the level of reliability of last-mile delivery must fulfil customers' expectations to increase the sense of reliability. By incorporating technology into the last mile delivery's service will ensure a higher level of satisfaction among customers hence increasing reliability. Likewise, flexibility is also viewed as a significant factor to consumer's satisfaction towards last-mile delivery. Moreover, flexibility is also found to be a significant factor in consumer satisfaction but is less functional when compared to reliability and technology. The ability of the logistics provider to deliver parcels according to consumers' ability is seen as the flexibility of the logistic provider. Hence, increasing customers' satisfaction and on eth long run encouraging repeat use due to flexibility in delivery. Finally, the consumers' attitude is also found to be less important for consumers' pleasure in last-mile delivery. Where the readiness of a customer to change their attitude towards last-mile delivery will have a significant impact on the customers' attitude according to their readiness. This can be supported by Larivière et al., (2017) where the attitude of a customer; influences the overall satisfaction.

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